



COMMERCIAL WASTE ZONING

IMPLICATIONS FOR THE UNITED KINGDOM

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FOREWORD

360 Environmental Ltd is an independent consultancy that specialises in providing support to businesses on waste legislation. They have substantial experience of waste collections but also the needs and stresses of packaging producers and are ideally placed to consider the topic from across the complete spectrum. The author of this report – Phil Conran - has 31 years' experience in the waste industry having previously worked for a national waste management company prior to becoming a consultant. He has extensive knowledge of the waste sector, engaging with a wide range of stakeholders across many areas of compliance.

ESA commissioned this zoning report by 360 Environmental on the basis that it would provide an objective and impartial position that would be substantiated through contact and discussion with a wide range of parties likely to be affected by a change from the current free-market service provision. In the report, ESA asked 360 Environmental to consider whether zoning, as discussed and proposed by Defra, Scottish Government, and others, might provide a cost-effective alternative to the current solutions in the market for commercial waste collections.

ESA welcomes the key findings of the report and intends to use this independent research as the basis for dialogue with Scottish Government and Defra to find a workable solution on commercial waste collections for all.



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1. Executive Summary

- a. Zoning has been widely considered as a means for reducing the cost and environmental impact of commercial waste collections and, for Local Authorities, an opportunity to improve the street scene. Implemented on a limited and variable basis in the US and Europe, there is little evidence to demonstrate that these objectives have been achieved. Indeed, information from the US indicates that, whilst a base-price might suggest cost savings, once additional costs for factors outside of the core service are added, the service price for the majority of waste producers have significantly increased due to the 'extras' that are charged for example, bin weights, distance to bins etc.
- b. The research carried out for this report indicates that this is also likely to be the situation in the United Kingdom (UK). As in any competitive market, prices relate to operational factors, competition and customer inertia. Consequently, a typical zone area may see widely varying prices, particularly between local and national customers. Whilst the overall revenue for a contractor in a zone area may fall in comparison to the total revenue for that area, cost modelling shows that there would be significant losers as well as some that would benefit.
- c. The modelling for this paper focussed on Glasgow as being a typical urban area under one local authority that both the Scottish consultation and the Defra EPR and Consistency consultations indicated to be the primary type of area to which zoning might be applied. The outcomes of the research are therefore considered to be applicable to any urban areas that might consider zoning for the future.
- d. The key outcomes of the modelling indicated that:
 - Based on average prices, more businesses would see higher waste service costs than see a reduction in cost.
 - There is a wide variation between different sized waste companies in the proportion of waste collected from SMEs compared to waste collected from more complex waste producers such as corporate accounts and large integrated waste contracts. Discussions with larger national waste companies indicated that SME waste volumes as a proportion of the total waste collected in an area, can be as low as 30%. For smaller local waste companies, SMEs would represent the majority of their client base.
 - Events such as COP26 create a significant short-term demand on resources that would be challenging for a local zone operator without national corporate support.
 - Pricing was heavily dependent on local access to treatment and disposal infrastructure. Forthcoming landfill restrictions will add to this due to the distances to waste to energy plants.
 - Local scale provided greater service flexibility for waste producers such as container types, carbon foot printing.
 - Exclusive zone areas would severely impact on businesses outside the zone areas that would lose market choice and potentially see significant cost escalation.
- e. The research raised a range of concerns amongst those interviewed and from examples of franchise zoning in the US:
 - The tendering process will be extremely complex it has taken some US authorities up to 10 years to develop and implement.



- Managing transition and ongoing franchise management will need significant local authority resource.
- The impact on the waste market will be considerable.
- Smaller operators will struggle to resource the tendering process.
- Many operators will go out of business, reducing the potential for competitive tender when the franchises come up for renewal.
- Higher barriers to entry will prevent new, innovative operators entering the market.
- There will be a loss of waste infrastructure as unsuccessful companies lose volume.
- The uncertainty leading up to implementation will stifle investment in new technologies and infrastructure.
- Local authorities fear significant revenue loss as they consider it unlikely they would be able to tender.
- There may be significant TUPE implications and vulnerability to industrial action
- Zoning trials are considered to be unworkable due to the short-term contract disruption.
- It is possible that the Competition and Markets Authority (CMA) would consider exclusive franchising to be anti-competitive.
- Local authorities also expressed concern, primarily over their ability to provide the complex range of services, support and added value such as carbon foot-printing that businesses increasingly demand, which would likely severely diminish their ability to compete. The consequential loss of current commercial business would have severe revenue implications for some local authorities.
- There were also strong concerns raised by waste producers:
 - Service levels especially during transition and contract accountability.
 - Contingency in the event of service provider failure.
 - Invoicing, contract management and compliance, particularly for national accounts where businesses expect a 'one-stop shop'.
 - \circ $\;$ Price escalation once competition is diminished for future tendering.
- f. However, among the stakeholders interviewed, there is widespread recognition that a more structured approach to commercial waste management could provide significant benefits. The New York model, in particular, offers many suggestions for improving the quality of service, reducing environmental impact and delivering greater sustainability, such as:
 - Licensing of operators under service standard requirements.
 - Carbon reductions through improved technology demands e.g. low-emission vehicles.
 - Tighter monitoring.
 - Reduced risk.
- g. The overall conclusion is therefore that exclusive zoning would be highly challenging to implement and would be extremely disruptive to the waste sector, local authorities and waste producers with little evidence that it would produce the intended benefits. It is recommended that the Scottish Government should explore alternative licensing options to provide the desired net service and environmental benefits whilst leaving market forces to deliver price optimisation.

2. Scope

The project scope was defined as follows:



- a. Review existing zoning practices, e.g. in Los Angeles or other US cities where they have been adopted. Ascertain what has worked, what hasn't worked and what could be applicable to a UK context.
- b. Model potential impacts of zoning (both positive and negative), in Scotland and the rest of the UK to test the WRAP figure suggesting that waste producers could realise 40% cost savings from zoning.
- c. Make recommendations for how the Scottish trials should be designed and implemented to ensure that they are representative of real-world impacts.

3. Background

a. The Circular Economy Route Map Consultation¹ issued by the Scottish Government in May 2022 identified zoning as a possible route to reduce environmental emissions and reduce costs to businesses through collaborative procurement:

'Zoning has been utilised in a number of locations to encourage collaboration and reduce local environmental impacts, such as a reduction in local air quality caused by multiple vehicles providing the same service in the same area. Analysis by WRAP has suggested that businesses could save up to 40% by collaborating on service procurement. Collaboration could also improve service consistency and improve recycling performance through optimised efficiency of collections.'

- b. Freedom of Information requests have been submitted to both the Scottish Government and Defra for the supporting data behind the claimed benefits:
 - The Scottish Government provided a response from WRAP that 'The 40% value you're referring to comes from a range of underpinning efficiency studies used to support the [packaging EPR] Impact Assessment and the questions in the Consultations. There's not one specific study but we were asked to give an approximation of the savings going from a baseline to high recycling (in various business types and sizes) and then with interventions put back in to alleviate costs. We didn't publish the specific zoning research simply because it was a phase one draft of work we are now continuing with phase 2 and it only considers one option of zoning of which there are plenty of variants.'
 - The request submitted to Defra was declined under regulation 12(4)(d) as 'the reports themselves are in draft form and the relevant information will inform wider policy and is a publication that is currently in the course of completion.'
- c. WRAP has declined to provide data but is understood to be continuing to explore the potential for zoning through a specific stakeholder group.
- d. This research is therefore predicated on the basis that no data exists to support these claims beyond some highly speculative assumptions.
- e. The Scottish consultation refers to the EPR consultation issued by Defra in March 2021 which identifies a range of zoning options:
 - Co-collection the contractor for household waste services also delivers the nonhousehold municipal (NHM) services
 - Framework zoning selected suppliers are licensed to offer services in the zone
 - Material specific zoning one contractor is contracted for food waste collection, one for packaging, one for residual waste services

¹ <u>https://www.gov.scot/publications/consultation-delivering-scotlands-circular-economy-route-map-2025-beyond/pages/9/</u>



- Exclusive service zoning one contractor delivers the core recycling and waste services for the zone.
- f. The Consistency Consultation² issued by Defra in May 2021 also referred to the potential for zoning and provides the following model as an example:

'This would allow local authorities or other partnerships to issue contracts for the collection of waste from businesses and other similar organisations in particular areas of a town or city. This would give rights to the operator(s) awarded the contract(s) to collect recyclables, food and residual waste in the designated zones. The system would reduce the number of operators and hence vehicles and associated emissions in collecting waste and make it more efficient for the waste collectors by maximising the number of pick-ups they could make in a particular area. It would operate in a similar way to business-based collaborative contracts but is expected to drive much bigger economies of scale and reduce costs to individual businesses. The franchising would likely be managed by local authorities and cover all non-household municipal waste producers in a defined area with funding made available for council administration and direct support. At the same time, it might be beneficial for the local authority to undertake business support activities, often in partnership with non-household municipal sector bodies. If local authorities were involved in a zoning scheme, any new burdens would be fully funded in line with Government guidance on new burdens.'

g. This would seem to indicate that the most likely model under consideration, that would provide the most benefit in terms of environmental impact and cost, would be one based on contractor exclusivity in a zone.

4. Methodology

- a. Existing practices in the US and elsewhere were considered through document searches and email communication with reporters in the US who have produced relevant articles.
- b. To understand the impact in the UK, extensive discussions were held with a range of relevant stakeholders to consider the theoretical impact and then to model that on a specific zone area. Visits to the Glasgow area and discussions with local operators identified the issues and opportunities that zoning raised.
- c. The potential impacts of zoning were explored and modelled through discussions with a range of relevant stakeholders. As indicated in section 3 above, the format for a zoning system was left vague in the Scottish consultation. For the purposes of this paper, the assumption is made that the most likely model under consideration that would provide the best theoretical outcome would be one of contractor exclusivity in zones for one or more service types. However, consideration is also given to the impact of the alternatives listed in the EPR consultation, in particular, non-exclusive franchising.
- d. Regardless of whether exclusive or non-exclusive, the broad principles were considered to be similar in terms of preparation, implementation and impact.
- e. The regulatory framework that would be necessary to implement and manage commercial zoning was considered in relation to the current existing free market system and experiences from existing examples of zoning in the US.
- f. The operational constraints of conducting trials and of system implementation were considered.
- g. A review was conducted of alternative options to achieve the ambition of reduced environmental impact and cost reduction.

² https://consult.defra.gov.uk/waste-and-recycling/consistency-in-household-and-business-recycling/



5. Overseas zoning operations

- a. Franchise zoning is in widespread use in the USA. Nevada, for instance, has regulated to allow Counties to manage waste collection through franchising and there are now many examples of exclusive franchising in place.
- b. There are divided opinions in the US on whether franchising has achieved a net benefit with little empirical evidence to support either case. But the primary positions put forward are as follows:
 - i. For:
 - Long term contracts incentivise infrastructure investment needed to achieve higher diversion from landfill.
 - Authorities have the power to force contractors to use clean fuel vehicles and achieve higher recycling rates.
 - Fewer hauliers will lead to reduced vehicle traffic.
 - Route density will deliver reduced cost and increased service levels.
 - ii. Against:
 - Waste producers are not happy at being forced to change contractors.
 - Fewer contractors will lead to higher costs, job losses and worse service.
 - Franchising will inhibit innovation.
 - Smaller waste operators would be put out of business.
- c. Franchises are issued for varying time periods, but typically, 10 years. Press reports indicate that after transition, overall service levels improve, investment increases and recycling levels increase. However, prices increase and service options reduce with waste producers forced to utilise effectively, what's on offer. There are examples of litigation by disgruntled businesses forced to use the franchise service when they have been offered significant cost savings by other operators.
- d. At present, Los Angeles is the largest example having introduced exclusive franchising in 2017 following a 10 year planning and implementation period. This covered all business and multi-family residential buildings and applied a single contractor for each of 11 franchise areas for a 10 year contract period.
- e. Press reports (Media response in Appendix 1) indicate a high degree of confusion in the 6 months following implementation. "Seven years of planning that was nothing compared to the "6 months of hell"³ the LA franchise programme manager is reported to have said. City officials now point to investment in hundreds of new clean fuel trucks, processing infrastructure and reduced waste to landfill although a 65% landfill reduction target was missed in 2019 and 2020. There are also reports of improved working conditions for staff.
- f. However, against that, on implementation, many businesses saw significant increases in their charges with reports that some faced bills two or three times higher. This was partly due to the number of contract-sanctioned fees that could be charged over and above the core service e.g. the driver having to unlock a gate or move a bin more than 30 metres. And prior to implementation, waste producers had the ability to complain directly to the service-provider

³ <u>https://www.wastedive.com/news/new-york-commercial-waste-zone-los-angeles-transition-recycling-labor/629021/</u>



company and ultimately to change provider, neither of which were then available under the franchise agreement.

- g. There are reports that legal challenges are underway in a number of franchise areas as waste producers are unable to use contractors able to provide more tailored services or have excessive cost increases.
- h. After years of wrangling, New York City is due to launch its commercial waste non-exclusive franchising ⁴ in 2023⁵. This is estimated to cover 100,000 companies in 20 zones with 3-5 contractors able to operate in each zone under a 10 year contract to collect an annual 3 million tonnes of waste. 50 companies have submitted bids and with each successful operator having to pay an annual fee of \$107,000 to cover the additional administrative burden placed on the local authority. Currently, New York has approximately 90 different waste companies operating across the city under little control or even basic standards. The new contract is radical and is designed to tackle a range of problems in New York through the imposition of wide-ranging contractual requirements:
 - Route optimisation all vehicles will be required to have GPS tracking for periodic scrutiny by the City contract team.
 - Pricing contractors tender bids have to include a price cap that restricts what they charge customers. This accounts for 40% of the assessment score.
 - Customer service contractors will be required to meet service standards, provide call centres, provide complaint history to the city and operate a website.
 - Health and safety contractors have to submit a H&S plan and will be monitored and evaluated on performance.
 - Workers' rights close monitoring of employment law, minimum wages, application of union rights by the City.
 - Waste management contractors must submit plans for meeting recycling targets and identify disposal arrangements. The City will apply an equalisation process to ensure that no part of the city bears an unreasonable proportion of the City waste.
 - Insurance and bond contractors will be required to cover liability risk.
- i. Unlike Los Angeles, the New York model⁶ will leave it to businesses to negotiate their contracts with the approved operators subject to the strict conditions laid out in the contract. The aims of the New York system are:
 - *i.* Zero Waste: Reduce commercial waste disposal and incentivise recycling
 - *ii.* Environmental Health: Reduce truck traffic throughout the city to reduce air pollution and improve quality of life
 - *iii. Pricing: Provide fair, transparent pricing with low prices for businesses*
 - iv. Customer Service: Strengthen customer service standards and establish accountability
 - v. Health and Safety: Improve training and safety standards to make the industry safer for workers and the public
 - vi. Labour and Worker Rights: Improve industry labour standards and uphold worker rights
 - vii. Infrastructure and Waste Management: Prioritise investments in clean, modern fleets and facilities that make up a reliable, resilient, and sustainable waste management system

⁶ <u>https://dsny.cityofnewyork.us/wp-content/uploads/2018/11/CWZ_Plan-1.pdf</u>



⁴ <u>https://www1.nyc.gov/assets/dsny/site/resources/reports/commercial-waste-zones-plan</u>

⁵ https://www.wastedive.com/news/new-york-commercial-waste-zone-rfp-2022-implementation/610114/

- viii. Robust, Competitive Industry: Create a system that works for operators of all sizes and prevents overreliance on any single company.
- j. Los Angeles and New York offer two very different franchising models. In both cases, the contracts are extremely complex. Beyond media reports, it is hard to find evidence of the success of the Los Angeles model and time will tell as to the success of the New York model.
- k. It is clear that franchise zoning is seen in the US as a long-term solution to excessive waste operators and overall environmental gain and that it has become an established practice that continues to spread. However, whilst the waste landscape to which franchise zones have been applied is similar to the UK, there are significant differences in the starting point, especially in relation to Scotland.
 - Separate recycling collections and a landfill ban are already built into Scottish regulation.
 - Local authorities have existing methods of controlling collections such as timeslots.
 - Markets are less fragmented than the US with increasing consolidation and regulatory control.
 - Waste producers especially corporates are driving environmental performance.
 - Regulatory developments in areas of duty of care waste tracking, carrier licensing in particular are forcing up standards and will reduce the number of operators.

6. UK operational issues – overview

- a. Extensive meetings were held with waste operators to consider the potential impact of zoning in a real waste environment. This was supported by modelling of the application of zoning under a single franchise operator in varying size zone areas in Glasgow as being representative of the key types of conurbations that would be considered as priority areas for implementation.
- b. Glasgow is the largest conurbation in Scotland and is assessed to contain around 21,000 waste-producing businesses ⁷ within the Greater Glasgow area. With a population⁸ of just over 1 million, it is twice the size of the next largest, Edinburgh. It has a highly competitive waste market with multiple operators providing a range of waste collection, transfer and sorting services.
- c. It also operates under time slot constraints imposed by the Council in the City Centre thereby adding complexity to consideration of a zoning system. Forcing multiple visits to service the same area undermines route density benefits.
- d. However, as table 1 on the following page shows, there is a long tail of conurbations that have business levels where it may be more difficult to sustain multiple contractors and where there may already be monopoly situations effectively, providing one of the two key benefits that the franchising proposal sought to provide carbon reductions through reduced vehicle movements caused by multiple operators.

⁸ https://en.wikipedia.org/wiki/List of towns and cities in Scotland by population



⁷ <u>https://sp-bpr-en-prod-cdnep.azureedge.net/published/2021/9/8/156e5f62-2676-4ce1-8885-7a11b5d0a0fb/SB%2021-60.pdf</u>

Conurbation	Enterprises
Glasgow City	20,965
City of Edinburgh	20,715
Aberdeenshire	14,200
Highland	11,480
Fife	10,460
South Lanarkshire	9,645
Aberdeen City	9,555
North Lanarkshire	8,390
Dumfries and	6,685
Perth and Kinross	6,585
West Lothian	5,300
Scottish Borders	5,275
Renfrewshire	5,255
Stirling	4,305
Falkirk	4,215
Angus	4,155
Argyll and Bute	4,040
Dundee City	3,925
South Ayrshire	3,840
North Ayrshire	3,570
Moray	3,565
East Ayrshire	3,550
East Lothian	3,410
East Dunbartonshire	3,145
East Renfrewshire	2,790
Midlothian	2,720
West Dunbartonshire	2,185
Inverclyde	1,805
Shetland Islands	1,580
Orkney Islands	1,535
Clackmannanshire	1,250
Na h-Eileanan Siar	1,250
Total	191,345

Table 1 – Number of enterprises per conurbation

- e. Typically, a trade waste vehicle needs around 1,000 lifts per week to be economically viable under normal market force prices.
- f. A waste service would struggle to provide the necessary support resource accounts, HR, central management etc without a much larger customer base and the provision of a range of other types of waste service.
- g. To achieve the efficiencies of operation needed to minimise costs would also require disposal/consolidation points that had the ability to receive recyclable and residual waste within a reasonable radius.
- h. The list above raises questions about how many areas could therefore sustain a single franchise operator who was not already operating in the area.



i. It would therefore suggest that, given the geographical nature of Scotland with the conurbations being widely separated, there would likely be many areas that would have to rely on the Local Authority providing collections under their duty as the waste collector of last resort and that zoning would create little benefit as there would be no savings to be had by increased route density.

7. Operational issues identified by waste sector interviews

a. Practicality of contract arrangements

- i. Of major concern was the potential disruption caused by transition from the existing open market position to zoning.
- ii. Modelling was carried out for Glasgow to consider possible options for zones and the implications.
- iii. On the basis of economic viability and operational impact and assuming a minimum of approximately 2,000 businesses for a zone, for illustrative purposes, the city was divided up into three scenarios – 12 zones needing two compaction vehicles per zone, 6 zones needing 4 vehicles per zone and 3 zones needing 8 vehicles per zone. (Appendix 2)

Glasgow	per year cost per contract per zone		
21k businesses	12 zone model	6 zone model	3 zone model
1 year cost	£5,758,459	£11,516,918	£23,033,836
3 year contract value	£17,275,377	£34,550,753	£69,101,507
5 year contract value	£28,792,294	£57,584,589	£115,169,178

1750 customers per zone 3500 customers per zone 7000 customers per zone

Table 2 – Potential revenue per zone

- iv. The revenue assumes an average provision of 3 services to each business residual waste, DMR (dry mixed recycling) and food waste (where the business produces food waste), all of which are required to meet the Waste (Scotland) Regulations 2012⁹ requirements. Adding a separate collection for fibre-based streams would add more service costs and complexity.
- v. There would clearly be fixed cost scale benefits related to zone size such as depot and administrative cost amortisation.
- vi. This gives an indication of the scale of resources that would be required were zones to be allocated to waste operators with little current presence in the city. As an indication of the impact this might have, one of the largest independent waste operators in Scotland has a total turnover of approximately £30m. To resource a zone in any of the models would therefore be a considerable challenge for anything other than the larger national waste operators.
- vii. The modelling also considered one particular waste producing sector pubs. There are approximately 400 pubs in the Glasgow conurbation, a significant proportion of the total waste market.
- viii. Analysis of waste operations illustrate the flexibility required by the waste operator. Pub waste compositional analysis (Appendix 4) indicates the proportions of different waste types that would need to be managed and seasonal analysis indicates that volumes can vary by as much as 50% (Appendix 5) The range of containers in use extends to 4 different types: Euro (240, 360, 660 and 1100 litre), FEL, roll on/roll off and skip.
- ix. There must also be recognition given to asset redundancy should existing operators in the conurbation be unsuccessful in all the zones. Whether the body issuing the zone contracts

⁹ https://www.legislation.gov.uk/sdsi/2012/9780111016657



would be required to pay compensation would be subject to legal advice, but certainly for small contractors that might not be able to re-deploy assets, the complexities and costs of transition on a large scale could be considerable. The need for separate collections of recyclables would add to the complexity of determining which services would be covered under a franchise agreement.

- x. As an example, a large depot may typically operate 20-30 HGV and have more than 30,000 various types of container in use. In addition, they may have several compactors, balers, glass crushing machines and other on-site waste volume reduction equipment deployed on long term contracts.
- xi. In the event that the operator of that depot was unsuccessful in any of the local zones, the depot itself would have to close with a significant loss of employment. Whilst the successful operators may wish to take over existing assets, the uncertainty caused by the tender process would also lead to a lack of local investment in growth, facilities and technology such as Low Carbon vehicles.
- xii. An exclusive zone system would require the successful operator to provide services to all of the waste producers in the zone. This would require every waste producing site to be surveyed by the operator to confirm container requirements, access, health and safety, collection frequency etc. A contract with each site would be required, credit checks applied, duty of care documentation signed and arrangements would have to be made with the existing operator to remove containers to allow the new containers to be delivered. Assuming a minimum zone size of 2000 waste customer sites, this process on its own would take several months.
- xiii. This also raises the issue of accountability and contract ownership. If the Local Authority has responsibility for defining the zones, the tendering process and awarding contracts, it is assumed that responsibility for waste producers would ultimately sit with them including credit checks, site compliance and any costs associated with site contract failure e.g. container theft, incorrect waste, bad debt etc. There must also be consideration given to customer premises where the contractor may be unable to provide the service or the customer fails credit checks. This could be, for instance, because the customer premises does not satisfy the Health and Safety criteria or access needs for specialist vehicles.
- xiv. Consideration must be given to the range of services that would be included in zoning. The services currently provided in Glasgow are similar to commercial services across the UK, but in Scotland's case, must take into account the need for separate collection of dry recyclables and food waste. In Glasgow, market shares vary considerably between different waste types and collection modes. Food waste, for instance, is largely dominated by one major collector, Keenans. Residual waste has a range of collectors including the nationals such as Biffa and Veolia, the regionals such as NWH and local operators such as Loop Recycling and Glasgow City Council. The nationals, regional operators and the Council dominate 1100 litre collection, but bag collection sees a much wider range of collectors. Glass waste collection is also fragmented.
- xv. Alternative waste collection modes skips, bulk collections and front-end loaders tend to be provided by far fewer operators and constitute a far smaller share of the waste market than 1100 litre and bags.
- xvi. In both cases, however, a critical element of service capability, cost and environmental efficiency lies in the availability of treatment and disposal options. A zone operator would need to have access to licensed facilities that could accept the types of waste collected and would need to ensure that agreements were in place before tendering for a zone contract. Existing operators are likely to have developed contracted supply agreements with treatment and consolidation facilities that could lead to significant penalties if the contractor was unsuccessful and difficulties in securing capacity if the contractor was successful. Where a new operator to the area was successful, existing treatment facilities operated by unsuccessful



operators could be either closed or restricted to the new operator who would be subject to potential cost implications.

b. Costs

- i. The Scottish Government and Defra consultations stated a potential cost saving of up to 40% for waste producers in a zone as well carbon savings through collection round efficiencies.
- ii. The costs for the various waste services are dependent on a range of factors:
 - Type of client e.g. a national account may be lower cost that a local account.
 - Number and type of containers.
 - Access e.g. locked gate that needs to be opened.
 - Waste type and volume/frequency of collection.
 - Weight of waste in each bin, where the principle should be that those who produce more waste should pay more than those who produce less waste.
 - Age of contract.
 - Available disposal distance and costs.
 - Contract support costs including account management, invoicing, duty of care, data reporting etc.
- iii. A survey of major waste operators in the Glasgow area indicated that for both residual waste and DMR, there were more sites with costs below the average than above.
 - General Residual waste 55% of the lifts were charged below the average price and 45% are charged above the average.
 - DMR 64% of these lifts were priced at below the average and 36% are priced above the average.
 - It therefore follows that unless route density efficiency savings could lead to a lower average price than was needed to deliver normal commercial returns, more businesses would receive a price rise than would see their charges fall.
- iv. There are clearly efficiency savings that can be achieved through single operator route density. But our research has indicated that these savings will be far less than the 40% and overall, could see costs increase.
- ٧. Modelling indicates that for residual waste collected in 1100 litre Eurobins – by far the most common collection type – costs are broadly split as follows:



1100 litre

- vi. Disposal should remain the same as will necessary overheads such as operational management, customer service, depot costs etc so the key area for efficiency lies with reducing fuel and labour changes per bin emptied by reducing the distance between each collection.
- vii. However, a 1100 litre collection shift of residual waste is generally limited to a maximum of 180 lifts for a single man crew at which point, it would need disposal. Whilst increased route density would see more lifts being achieved in a shift, for health and safety reasons, it would need a two-man crew. The vehicle would also still need to be taken to a disposal site after 180-200 lifts. The increased labour cost would therefore negate some of the route density savings whilst the increased frequency of disposal would reduce the carbon benefits. Disposal costs remain the same and whilst overheads would be spread over a greater number of collections, modelling actual operational costs has shown that it is unlikely that an exclusive

zone contract could deliver savings on current total operational costs of greater than 10%. This would narrow the number of businesses that would see any savings on current costs and overall, would lead to a higher proportion with increased costs.

viii. The consultation gives no detail on the method of charging, but it is assumed that a fixed core price for each waste type and collection container would be applied in line with franchising in other countries. This would need to be supported by a pricing matrix for variables such as:

- Number and types of containers per pick up location
- Distance to move the containers
- Over-weight containers
- Waste composition and levels of contamination
- Contract duration
- Management fees
- ix. Waste operators currently provide flexibility that make allowances for variations 'swings and roundabouts'. Operators report that a standard fixed price contract would take away that flexibility and as highlighted in para 5.f. with the experiences in Los Angeles, would be likely to lead to significantly higher overall prices for the majority of businesses.
- x. Critical to the delivery of competitive pricing would be the availability of treatment and consolidation points for each of the waste types included within a zone. Appendix 3 shows the current disposal points in Glasgow for different materials which in theory, given normal market access rights, should provide a sufficient breadth of capacity for those competing for zones to operate effectively. However, many of those disposal points are operated by waste businesses primarily to support their collection activity. Should those businesses be unsuccessful in tendering for zone areas currently feeding those disposal points, the operators have indicated that facilities would be likely to close without guaranteed supply. It is also likely that where a facility had to operate on merchant capacity supply (ie from third party disposal points), that prices would reflect the competitive market and these would likely be higher for those third parties than for waste from the contractor operating the site. In considering the scope of tendering, the tenderer would need to consider whether treatment should also be tendered and whether the potential impact on disposal and treatment infrastructure would need some form of regulating mechanism.
- xi. The ban on the landfilling of municipal biodegradable waste applied by the Scottish Government from 31 December 2025 already has huge implications for waste collectors in Scotland who are already contracting for capacity with the limited incinerators available which, because of geographical proximity, will need to be bulk delivered from waste transfer stations.¹⁰ This emphasises the importance of local transfer infrastructure that might be at risk through operator closures where they are unsuccessful in obtaining zone contracts.

¹⁰ <u>https://www.gov.scot/publications/consultation-delivering-scotlands-circular-economy-route-map-2025-beyond/pages/11/</u>



- xii. A point raised by all those surveyed was the need for zone operators to be able to deliver on the wide range of service variables. As well as the collection mode and container variations, this includes:
 - Collection times including out of hours.
 - Compliance with timeslot controls
 - Container weighing
 - Zero to landfill
 - Carbon footprinting
 - Recycling rate

c. Customer types

- i. A typical depot will service a range of customer types:
 - Local generally single site managed by the depot
 - Major large single sites managed through an account manager and the depot
 - National corporate account covering similar sites throughout the UK managed centrally e.g. pub chains, retailers
 - Broker sites subcontracted by a broker, usually corporate accounts.
 - Integrated usually single sites with sophisticated waste needs covering a range of wastes including hazardous and managed centrally
- ii. As well as the specific needs of different customer types, depots also need to manage other variables.
- iii. The modelling of pub collections (Appendix 5) illustrates the impact of seasonal variation. Zone operators would also need to consider ad hoc events and other seasonal requirements such as the Edinburgh Festival and tourism which can add significant additional equipment and staffing requirements. Major events such as CoP 26, and the St Andrews golf Open - which required 570 containers and extensive collection vehicle resourcing for a period of two weeks – must also be considered. Often these can only be supplied through the large waste operators through their spare container and vehicle stock. Event management will tender out the contract for waste which would need to be serviced by a local operator that has the scale and resources to manage irregular demand.
- iv. Operators also raise the issue of security with prisons for instance, requiring administratively taxing clearance procedures.
- v. These highlight the need for contractor flexibility in being able to provide additional resource when required but also the need for back-up such as spare vehicles in the event of breakdown.
- vi. Of key concern to waste operators was the ability to service customers that demanded centralised management, pricing and service KPIs. For some, this can account for as much as 40-50% of local depot work where prices are negotiated nationally, customers managed centrally and the operator is required to meet additional service requirements such as service success targets, environmental KPIs, individual site waste statistics etc. Whilst the servicing of these sites within a zone not operated by the contract waste operator could be carried out through sub-contract in a similar fashion to current broker operations, the waste operators would need to have the ability to agree pricing and contract conditions in line with the client national contract. Where zone price and service support are set through the zone contract, there is likely to be significant incompatibility with national account needs with the potential for legal challenges over market distortion and anti-competitive practices.
- vii. The issue of orphan rounds was raised in relation to businesses that sat outside the zones. On their own, these would often be uneconomic, but existing operators will service them on a subsidised basis with the flexibility for collections to fit in with optimised routes. It is difficult to see how these would be serviced without heavy price increases.



viii. A major factor governing the existing collection of Glasgow and Edinburgh City Centre is the application of time slot collections whereby businesses are only allowed to have their waste collected on selected time slots. Whilst minimising the impact of waste collection on the City Centre, it applies significant cost and environmental inefficiency to collection rounds requiring contractors to visit the City Centre multiple times a day. If this principle was applied to a City Centre zone, it would lead to multiple vehicle movement in direct contradiction of the desire to minimise movements.

d. Local authority collections

- i. Discussions held with Local Authority Managers indicated significant concerns from Local Authorities over the application of zoning. At present, Councils operate commercial waste collections as a legal 'supplier of last resort' although many have developed the commercial waste business to provide additional revenue through the optimisation of resources primarily geared towards their household waste responsibilities. Their concerns were:
 - There would be issues with procurement legislation that might inhibit their ability to compete for tenders.
 - If they lost commercial customers in a zone area, it would have a significant impact on revenue that is used to enhance their core domestic waste services.
 - If they tendered for a zone and were successful, they are not structured to manage those type of scale services and would struggle to finance the investment that would be needed in service management customer service, invoicing, debt management etc, vehicles and containers.
 - The scale and complexity of zoning contracts would need significant additional administrative resource and would impact on their core household service responsibilities.
 - There must also be consideration given to potential conflicts of interest and the complexities of zone contracts. As later discussed, the most likely body to issue zoning contracts would seem to be the Local Authority who would be responsible for managing the organisation delivering the zone services to business waste producers.

e. Competition

- i. The widely held view amongst commercial waste operators was that competition is the key driver to both cost and service quality and that exclusive zoning would not only risk increased costs for waste producers at the outset, but would significantly increase the risk of higher prices at zone contract renewal.
- ii. As previously discussed, unsuccessful operators would effectively be forced out of the local market which would see a reduction in both collection and disposal options when the contract came up for renewal.
- iii. There has also been strong concern expressed by waste producers highlighted by a recent survey where 63% of businesses that responded to a survey of SME waste producers stated they would not want a local monopoly council waste service supplier. The survey also highlighted that service reliability rather than price was the key priority for businesses.

How happy would you be to have recycling	Total businesses surveyed – 201	
waste and recycling services only available	(Recorra/UROC survey, 2020)	
through council collections?		
Very happy	7%	
Нарру	8%	
Neutral	22%	
Unhappy	31%	
Very unhappy	32%	



In selecting your waste/recycling collector, what are the top two factors in deciding who to choose?

100 90 Reliability 98 80 Collections at a specific time or ... 32 70 60 Cost 56 50 Types of container offered 8 40 Range of materials collected 45 30 20 Other (please specify) 13 10 0

Please only select your top **two** options, or choose other and specify

iv. Multi-site businesses have highlighted that the purpose of a national account is to have a 'one stop shop' that has control over the type and quality of service delivery under a single contract with a single invoice and with duty of care all handled under one roof. Local businesses have expressed concern over the lack of choice should an exclusive zone system be applied. At present, businesses have the option of choosing alternative service providers either at the end of a contract term or through service failure.

f. Innovation

More Details

- i. Waste companies highlighted that innovation and investment depended on certainty and the ability to control their own destiny within normal commercial constraints.
- ii. It was emphasised that the waste industry was going through a period of unprecedented uncertainty, both in Scotland and the rest of the UK, with extensive pressure through global events such as carbon reduction and fuel prices and national issues such as the proposed landfill ban, the introduction of the Deposit Return Scheme (DRS) and Extended Producer Responsibility (EPR).
- iii. Where waste companies operate in a competitive market, they can make judgements on these impact in relation to their own growth expectations. However, it has been made clear that a Scottish Government commitment to the introduction of zoning on an unspecified timescale would have a significant detrimental effect on these business decisions due to the risk of loss of waste volumes and the potential impact on infrastructure, equipment, staff and contracts.

g. Contracts

- i. Legal opinion has not been sought for this paper on the potential legislative constraints that might apply to the principles of zoning. However, legal advice ¹¹ provided to a consortium of small to medium sized waste operators in 2020 for a study into the potential issues of zoning following the potential use of such a system proposed by Defra concluded:
 - Exclusive franchisees would be subject to the Competitions Act 1998. The range of service requirements and waste producer variations would make this extremely challenging with waste producers subject to costly and complex legal proceedings.

¹¹ ANALYSIS OF DEFRA PROPOSALS TO INTRODUCE COMMERCIAL WASTE COLLECTION FRANCHISING IN ENGLAND – Shoosmith LLP 2020



- The CMA has identified significant concerns that local authority procurement processes can lead to sub-optimal service outcomes.
- If local authorities were responsible for franchisee procurement, they would be subject to the Public Contracts Regulations 2015. This is likely to strongly favour large operators with the resources to participate in lengthy and costly procurement processes.
- Where franchise arrangements forced the cancellation of existing contracts, there may be significant legacy issues.
- ii. As highlighted in the section on existing zoning in other countries, the primary model where zoning has been applied in other countries is one of individual Councils applying their own interpretation of zoning within their Council boundaries.
- iii. The implication of the section on zoning in the Scottish Government consultation is that the Scottish Government would draw up a model contract establishing national principles, guidelines and legal requirements and that Councils would manage the tendering process for the zones in their area. They would then be required to manage the zone operators having issued the contracts. This raises many issues in the eyes of waste operators, Councils and waste producers:
 - Developing a model contract can take several years. Once the process of developing zoning was announced, it would have a major impact on investment, disposal contracts, and innovation for existing operators due to the long term uncertainty.
 - The zone contract scope would be an important consideration for potential tenderers. What waste types might be covered? Collection modes e.g. trade waste with bags and bins, Front End Loaders, exchange modes?
 - Would service responsibility sit with the Council and if so, what powers would they have in the event of service failure, either for individual waste producers or across the zone?
 - What would the roll out period be? As previously mentioned, depending on the size of a zone, this could require not only large quantities of bins, but new vehicles, compactors and even the setting up of a depot. Given the need for site surveys, vehicle deliveries of a year or more and other practical factors, the roll out could extend into years.
 - This would be significantly minimised by the allocation of contracts to operators who already have a large local presence, but this would add to the concerns over competition.
 - Who would be responsible for credit checks, invoicing and bad debt? It is assumed it would be the Council. New York has indicated that they have taken on 10 new staff just to administer the roll out and management of the zoning contract and complaints.
 - It is assumed there would be a franchise fee paid to the Council to cover these additional costs would this be set nationally or locally? This would, of course, have to be added to the costs incurred by the zone operator and charged to businesses.
 - Accountability was widely questioned as to where the lines were drawn between the service supplier and the Council? Would the contract for waste services be between the Council and the waste producers within the zone including container supply, duty of care, waste separation, waste collection, invoicing, data provision etc? Or would the contractor be expected to take on that responsibility in which case, what powers would the contractor have to reject a customer in the case of bad debt, non-compliance, health and safety etc? It is estimated that at present only 60% of businesses have services that meet the regulatory requirement for separate collection. Where would responsibility lie for enforcement?



h. Tendering

The resource needed to tender for a zone and the complications of pricing a tender were raised by both Local Authorities and waste contractors. Tendering would require extensive resource for each zone to determine a wide range of factors, for example:

- The number of collections points.
- Waste volumes
- Container types and numbers
- Frequency of collection
- Disposal options and costs
- Collection restrictions
- Depot availability

In addition, tenderers would have to consider the number of tenders they submit and the impact of success or failure. For instance, the depot and administration needs will be significantly less per collection if the contractor was successful in a number of zones in a zone area than if they were just successful in one. Multiple zone success would also allow the contractor to operate more flexibly on outlying adjoining areas within zones, thereby providing greater cost efficiencies.

The cost of tendering is likely to restrict the number of operators able to tender with the larger companies in a much stronger position to tender for multiple zones. And an operator with a waste transfer station or sorting facility in the zone area would hold a significant advantage in tendering over one that had to rely on third party disposal, especially once the landfill ban takes effect in Scotland. This uncertainty would be likely to lead to significant contingency built into pricing.

One major national operator stated that 'zoning would threaten Scottish viability' for their operations and the impact on future tendering with significantly reduced operators in a region must not be underestimated.

i. Trials

The consultation states 'We will conduct research on the feasibility of a zoning approach and run trials with partner organisations to understand the feasibility of wider rollout.' However, discussion with the waste industry has questioned the feasibility of trials due the complexity and disruption.

- An exclusive zone trial would require all waste producers and their waste service providers to be identified in a defined area.
- The scope of the trial would need to be agreed type of waste, types of container, collection frequency, etc.
- Agreement would need to be reached with a waste contractor to service all the commercial waste producers in the defined area.
- Agreement would need to be reached with any waste producers not already serviced by that contractor to participate in the trial. Duty of care documentation and a trial period contract would need to be put in place for those businesses.
- Agreement would have to be reached with those waste contractors servicing businesses in the trial area that the trial operator could utilise their containers and service their customers.
- The trial-conducting waste contractor would need to survey the complete trial area to ensure it was able to service all the businesses.
- The commercial arrangements would need to be varied and could then lead to compensation for the waste operators and potentially, the waste producers in the trial area, especially if a fixed pricing system was to be implemented.
- The waste operator conducting the trial would need to ensure they had disposal arrangements in place for the additional waste collected.



• There would also be considerable sensitivity for waste contractors from the information the trial contractor would receive on waste producers

j. Environmental impact

Whilst the environmental focus has been on reduced HGV movements, other environmental impacts have been raised.

- A fixed pricing mechanism reduces the incentive to minimise the amount of waste produced. This would point to the need for charges by bin weight, but research has indicated that volume has more of an impact that weight as low-density waste can lead to loss of vehicle capacity optimisation.
- Short term contracts 3-5 years are likely to minimise the incentive to invest in greater environmental efficiency and low carbon technology, whether for vehicles or treatment capacity. Zone franchise contracts in the USA are generally 10 years to allow not just for fleet optimisation, but also treatment development.

k. TUPE

Depending on the impact on waste operators, consideration must be given to the Transfer of Undertakings (Protection of Employment) Regulations¹². It is considered likely to affect an operator's staff where, because of the size of the operator and the impact of the loss of business in a zoned area, the business effectively ceases to be able to operate in that area and the staff cannot be moved elsewhere.

8. Alternatives to exclusive franchise zoning

The Scottish Consultation refers to the Defra consideration of franchising in the 2021 EPR consultation which lists three alternatives to 'Exclusive Service Franchising':

- Co-collection the contractor for household waste services also delivers the nonhousehold municipal (NHM) services
- Framework zoning selected suppliers are licensed to offer services in the zone
- Material specific zoning one contractor is contracted for food waste collection, one for packaging, one for residual waste services.

Opinions on these have been mixed from operators:

- Co-collection in Scotland would effectively mean that all waste in Scotland would be collected by Council in-house services. If this was restricted to one mode – for example trade waste compaction – to fit in with existing domestic waste collections, servicing modes other than trade waste would be unlikely to be viable for other waste companies operating in the area forcing them to leave the market.
- From a waste producer perspective, they expect all their waste to be managed by a single operator with a single invoice. This would raise issues of customer ownership, liability on compliance etc. Whilst this may work for outlying businesses, there is unlikely to be any cost benefit to waste producers and would add significant complexity to local authority waste services.
- Framework zoning would give local authorities the opportunity to limit the number of
 operators able to provide services within their boundaries and potentially achieve some of
 the perceived benefits of exclusive franchising fewer vehicle movements, cost benefits –
 whilst maintaining market competition. However, many of the issues highlighted for exclusive
 franchising would still be applicable complex tendering and transition, restricting choice for

¹² <u>https://www.gov.uk/transfers-takeovers</u>



waste producers, transition - whilst diluting the aim of franchising to reduce cost and vehicle emissions.

 Material specific zoning – this provides opportunities to introduce new services where exclusivity would enable contractors to invest in a service that may otherwise be uneconomic if subject to normal competition with the risk of their investment being undermined. However, there remains the risk that zoning would potentially inhibit growth and restrict customer choice should alternative more cost-effective services develop. Experience in Glasgow has shown that the more difficult wastes have seen market rationalisation that has led to limited operators for food collection, for instance, and market interference runs the risk of reducing efficiency and opportunity. Data provided by waste companies indicate that only 65% of business currently separate their waste according to regulatory requirements indicating a growing need for additional containers and enforcement.

Other options have been considered:

- Local licensing A control mechanism that surveyed operators strongly supported is the application of a licensing system that added local requirements to the national waste carrier registration system. It is hoped that the revised waste carrier registration requirements, currently awaiting a government response following a recent Defra consultation for England¹³, will lead to a much higher national level of waste operator competence and compliance. Local licensing would allow Councils to license operators against key quality criteria such as vehicle emissions and service standards. This would maintain a free market but would prevent the market being undermined by the operators that pay little heed to compliance or environmental good practice. Concerns were expressed about the potential for excessive local variation but it was considered that this could be avoided through a national local licensing framework. It should also be noted that CBD reform proposals were considered in the Scottish 2014 Act but have not yet been implemented
- BIDs (Business Improvement Districts) Business Improvement Districts are business led partnerships which are created through a ballot process to deliver additional services to local businesses. They are a defined area in which a levy is charged on all business rate payers in addition to the business rates bill. This levy is used to develop projects which will benefit businesses in the local area. There are 37 in place in Scotland. They provide opportunities to develop local procurement agreements which can, in the case of waste, specify service conditions and provide cost benefits through scale contracts. However, there is little evidence of the use of BIDs to achieve local procurement benefits for waste and as a basis for significant change, the BID system does not appear to have been successful.

9. Conclusions

The opportunities presented by franchise zoning appear to be significant on a theoretical basis, with an expectation of reduced carbon emissions and lower waste collection charges. However, where franchising has been applied, there is little evidence available to show that the intended benefits have been realised. Where benefits have been achieved, they have generally come at a cost for commercial waste producers and there have been problems with transition. Whilst at present, surveys indicate strong support for franchising among waste producers, this appears largely to be based on a misrepresentation of the likely outcome caused by unverified claims of cost savings. Should these claims not be realised, there is likely to be considerable backlash from businesses and, once implemented, a franchise system will be difficult to reverse. Businesses will not only be forced to live with the scheme for the contract period, but at the end of that period, the reduction in operators and

¹³ <u>https://consult.defra.gov.uk/eq-resources-and-waste/consultation-on-cbd-reform/</u>



disposal facilities caused by the franchise system will expose the implementing authorities and businesses to much reduced competition for the following contract period.

What is clear from the research is that franchise zoning would have far reaching impacts on the waste sector and the implementing authority, assumed to be the local authority, if applied to Scotland:

- The tendering process will be extremely complex it has taken some US authorities up to 10 years to develop and implement.
- Managing transition and ongoing franchise management will need significant authority resource.
- The impact on the waste market will be considerable.
- Smaller operators will struggle to resource the tendering process.
- Many operators will go out of business, reducing the potential for competitive tender when the franchises come up for renewal.
- There will be a loss of waste infrastructure as unsuccessful companies lose volume.
- The uncertainty leading up to implementation will stifle investment in new technologies and infrastructure.
- Local authorities fear significant revenue loss as they consider it unlikely they would be able to tender.
- There may be significant TUPE implications.
- Trials are considered to be unworkable due to the short-term contract disruption.
- It is possible that the CMA would consider exclusive franchising to be anti-competitive.
- Single operator 'monopolies' are at risk of impacting on resilience in the event of service failure, industrial action or other events that prevent the incumbent franchise operator from providing the contracted service.

However, the waste sector does welcome the opportunity to work with the Scottish Government to investigate alternatives to franchise zoning to achieve the key objectives of environmental impact and cost reduction. In particular, the sector would welcome discussions with the Scottish Government on the development of a national framework of operator licensing under a standards system that considered emissions, service standards and sustainability that would provide the benefits of a competitive market without the considerable disbenefits that would be experienced through franchising.

The sector would also welcome opportunities to consider local and national regulatory reform to identify obstacles to efficiency and to consider proportionate controls that would raise standards and positive environmental outcomes without adding environmental risk. For instance, this could include a review of waste status to encourage greater reuse and simplification of waste licensing controls to encourage new technology investment.

The wide-ranging change to the waste landscape over the next 5 years, both inside Scotland and more widely across the UK - e.g., DRS, landfill ban, waste tracking, EPR, consistency - will be extremely challenging for both the private and public sector involved with waste management. Adding the uncertainty of waste zoning is considered unlikely to see a net benefit that would be justified by the disruption caused by taking forward the proposals for zoning included in the consultations.



10. Appendices

Appendix 1 – email from <u>Howard Fine</u> (reporter with the LA Business Journal) regarding Los Angeles franchising

I appreciate you reaching out to me about Los Angeles' experience with waste hauling franchises.

When L.A. instituted the franchises in 2017, there were lots of initial problems.

First, building landlords received surprise bills with huge increases: sometimes double or even triple what they were previously paying. The franchise waste haulers added charges added for taking trash bins up long driveways and for having to enter secure areas (such as locked apartment building garage gates) to pick up those trash bins. The L.A. City Council stepped in and ordered an end to some of those charges. But overall, the waste hauling bills landlords received remained much higher than before.

Also, during the first 90 days or so, as waste haulers were adjusting to their new service territories, they missed a lot of trash pickups and trash accumulated for days or even a couple of weeks.

Another issue in Los Angeles: over the years, prior to the waste hauling franchises, there were dozens of small, family-run waste hauling businesses that picked up trash in very small areas and charged much lower rates than the big companies such as Athens Services. Some of these small haulers served particular types of customers such as construction companies, film production sets or restaurants and limited their pickups to those industries. Whatever the case, these small niche haulers were largely put out of business.

After these initial problems, the system did settle down. We haven't heard much about it since early 2018. What I can say is this: most landlords ended up having to pay more for their waste to be hauled away than prior to the franchises and a lot of small family-run waste haulers had to shut down. I've not seen any studies on whether trash pickup is more efficient or whether there has been a decrease in diesel and greenhouse gas emissions from waste hauling trucks - two of the reasons advocates gave for pushing through the waste hauling franchises.

That's all I can tell you.

Hope this helps,

Howard

Howard Fine Staff Reporter Los Angeles Business Journal



Appendix 2 – Possible zone scenarios - Glasgow





Appendix 3 – Current treatment consolidation and disposal points – Glasgow



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Appendix 4 – Pub analysis - waste volume seasonal variation

Pubs analysis





Appendix 5 – Pub analysis - waste volume by type

Pubs analysis – Seasonality – medium City only – ALL waste



SUEZ zoning modelling - discussion version

