Cost Benefit Analysis
of
Ethical Disposal Options
for
Excess Office Furniture

Executive Summary

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Purpose of this report

The London Borough of Camden is the lead Local Authority on a 2-year project for the London Centre of Excellence on sustainable procurement. The London Borough of Camden is assisting the London Fire and Emergency Planning Authority (LFEPA) to determine the most affordable sustainable method for the disposal of excess office furniture. As part of this undertaking Ogilvie Ross, sustainability consultants, have been commissioned to provide a cost benefit analysis on some of the options being considered.

The main aims of this report are to:

Identify the quantity, condition and suitability for reuse of all the furniture currently situated within the specified locations around the Albert Embankment area for London Fire Brigade.

Detail the most environmentally, socially and financially sustainable options for office furniture reuse, recycling and disposal.

Identify the most effective methods for the implementation of a suitable reuse & recycling system taking into account factors such as local employment, cost effectiveness and integration with the wider social needs.

Create an implementation plan for the disposal of furniture and detail the specific financial, social and environmental impacts such a plan would produce.

The information contained in this report is based on research and past experience and is as accurate as it is possible to ascertain.

In creating this report Ogilvie Ross will focus on the operational issues rather than the accumulation of academic data for analysis and future reference. Our aim is to produce a document that can be used to make informed decisions regarding the impact the disposal of a large volume of furniture will have

Limiting factors and general concepts

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In order to provide the most useful and accurate information in this report Ogilvie Ross has drawn on the past experience of one of the firm's partner's, John Ross, and his direct involvement in the UK & European office furniture industry, knowledge of the Scottish & UK timber recycling industry, past work with large-scale office furniture disposals and his contributions to the development of local authority wide office furniture reuse & recycling systems.

In taking this approach Ogilvie Ross recognises that this report will include references to specific projects and innovations, which are directly linked to previous work undertaken by Ogilvie Ross. It is recognised as a limiting factor when organisations look to tender for contracts but unfortunately there is little Ogilvie Ross can do to resolve this issue and it would not be in the interests of those commissioning this report to exclude initiatives currently being developed by Ogilvie Ross on the grounds that there is only one possible provider.

Reuse compared to new purchase

In preparing this report a number of discussions took place regarding the suitability of all the identified furniture being reused in London Fire Brigade's new headquarters building. Whilst it is theoretically possible to reuse the majority of the existing furniture it should be recognised that there are constraints in the use of a wide range of mixed products in a single large installation.

Past experience shows that single sourcing one range of new products for a large single site installation of furniture allows maximum flexibility for reconfigurations over a prolonged period. On the basis that the selected new furniture has a high degree of inter-connectivity between components then it is possible to greatly increase the product life span and therefore reduce the need to replace or purchase new items of furniture as part of the normal schedule of reconfigurations and relocations within the building.

Given the mix of different manufacturers products across the existing 4 buildings it would have to be seen as a short-term solution to furnish the new building with the existing furniture. Whilst it would be possible to plan the initial layouts using the existing furniture it would be very difficult and ultimately considerably more expensive to continually have to replace single items to meet future relocation requirements. Modern IT requirements and the speed with which technological changes take place can put considerable pressure on the management of office furniture and a large scale building furnished with a mix of different non-interchangeable furniture would not be a viable long-term solution.

Although it would not be advisable for London Fire Brigade to reuse the existing furniture in a single large installation the furniture is very suitable for smaller reuse projects where up to 50 staff require matching furniture in a single installation. The potential to dispose of the existing furniture for reuse in smaller scale projects should form the basis for a sustainable disposal strategy.

CO_2 comparisons

Transportation

For the purpose of this report the issue of comparative CO_2 emissions for vehicle use has been dismissed. The reason for this is that vehicle emissions depend on a wide number of factors such as type and age of vehicle, length of time since last service, amount of traffic congestion, weight of furniture on a specific load, specific fuel usage etc. An additional factor is how to assess the CO_2 emissions in the situation that the vehicle used for furniture transportation is completing the return part of a trip and it has been possible to "back-fill" the loading rather than commissioning a new trip. Additionally the comparative difference between the various types of vehicle usage is likely to be the smallest aspect of the CO_2 emission process.

For the purpose of this report the CO_2 emissions relating to the various vehicles used in the disposal processes are not calculated as it is highly likely that the differences between the various options are unlikely to make a significant difference to the overall impacts. Once a

suitable disposal option has been selected it would be possible to produce an outline emission statement prior to commencement of the work and then measure actual performance against the plan and objectives.

CO_2 comparisons
Manufacture
The production of the new furniture and the transportation to the new building will be by far the greatest CO_2 contribution. Whilst there are no accurate figures detailing the CO_2 emissions produced as a result of manufacturing office furniture it is possible to provide indicative figures for the production of the steel components. The specific CO_2 emission levels produced during the manufacture of 1 tonne of steel are in the region of 2.25 tonnes of CO_2 for each 1 tonne of new steel (Average based on data from Blue Scope Steel (http://csereport2005.bluescopesteel.com) and Tata Steel (http://www.tatasteel.com/webzine/tatatech39/page14.htm)). From the inventory analysis it was calculated that the total steel/metal content of the existing furniture would be in the region of 36.6 tonnes. Assuming a similar level of steel was to be used in any new furniture production then the CO_2 emissions for the steel componentry would be in the region of 91.5 tonnes.

It is estimated that recycling steel produces approximately 45% of the CO_2 compared with new manufacture. On that basis recycling the same volume of steel componentry would produce somewhere in the region of 41.5 tonnes of CO_2.

By reusing the furniture there is no energy requirement to recycle the steel and therefore the comparative CO_2 figure is zero. Similar principles can be applied to the timber and plastic components although specific levels of CO_2 production are unavailable at this time.

General concepts
The specific concepts for reuse of furniture are based on past experience and the initial product inspections. No detailed deconstruction of any furniture was undertaken in the creation of this report.

The specific data concerning the volumes of furniture and the relative weights has been taken from information provided by LFEPA and the Inventory Analysis Report completed by Ogilvie Ross in February 2007.

Executive Summary

This report analyses the three most practical options for the disposal of a large volume of excess office furniture on behalf of London Fire Brigade.

An inventory analysis carried out in February 2007 identified approximately 5,566 items of furniture will require to be disposed of with and approximate weight of 297 tonnes.

Whilst the furniture is in good condition it is not recommended that the furniture be the first choice to furnish the new building as there are a number of different styles and ranges of furniture and would be very difficult to manage such a mix of products across a single site.

The options available to dispose of the furniture are disposal to landfill, disposal through a single social recycling service and disposal through a managed social recycling network.

Landfill disposal

Costs for landfill disposal are likely to be in the region of £77,000 including site labour to dismantle the furniture and transport it to allocated skips. This equates to 259 per tonne.

The environmental impact of landfill disposal is the fact that 297 tonnes of mixed waste will be added to the waste stream. There are no environmental benefits from this option.

Socially this disposal option is neutral and has no significant bearing on employment or the wellbeing of the community.

Single social recycling service

The likely costs for disposal by means of a single social recycling services will be in the region of £71,000 including site labour, transportation for processing and gate fees. This equates to £239 per tonne.

The environmental impact is mixed as only a small amount of the furniture is likely to be re-introduced into the reuse marketplace and the balance will be processed for the recyclable materials. The energy required to recycle the materials will be considerable although no accurate data is available to quantify this.

The social impact is very good as employment is secured in organisations that require this type of work for their survival. There are undoubtedly public relations opportunities from being seen to support the work carried out by social organisations. This may have some benefit in developing wider recognition of the work London Fire Brigade are doing to enhance their sustainable credentials.

Managed social recycling network

The likely cost for disposal through a large-scale managed social recycling network will be in the region of £48,300 including site labour and transportation to the process centre in Dundee, Scotland. This equates to £163 per tonne.

The reason behind the lower disposal costs are that a far higher proportion of the furniture is sold into the reuse market thereby offsetting the single social recyclers likely disposal costs for timber and waste chipboard. Resale margins are high as there is no cost for the product as the donor organisation covers the costs of dismantle and transportation.

Unlike the single social recycling process the managed social network offers much higher levels of product being re-introduced into the marketplace with very little material recycling. The environmental impact is likely to be as follows:

- Significantly less energy and CO_2 production as a result of material recycling as a far greater amount of the furniture is reused thereby reducing the need for material break-up and processing
- Neutral transport impact

- Significantly less energy and CO_2 production as a result of not manufacturing new furniture

As with the single social recycler the social impact is positive and represents an opportunity to enhance the social standing of London Fire Brigade.

Project management
Implementation of a project of this size requires significant management time to be invested in the forward planning and final delivery stages regardless of which disposal option is chosen.

The amount of dedicated management time required to oversee this project is likely to be in the region of 60 days over an 11 month period. If the management is contracted to a specialist service provider the likely costs will be in the region of £40,000.

Disposal of white goods and the WEEE directive
At the time of writing there is no clear description from DEFRA or the British Government as to the exact requirements and regulations which will be applied as of implementation of the directive from 1st July 2007. On this basis it is not clear how best to dispose of the WEEE covered items and clarification of the specific requirements will need to be sought in due course. Where possible electrical goods should be reused by the organisation holding title to the goods. Whilst there are well-established social networks providing refurbished white goods into domestic reuse it is as yet unclear exactly how the WEEE directive will impact these social projects.