FURNITURE REUSE SOLUTIONS

A framework for analyzing asset disposition options

Furniture Decommission Decision Model

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Introduction

Furniture decommission seems like a straightforward process until it is time to decide what to do with the surplus furniture. When the surplus inventory includes usable furnishings, the choices are unclear. Do you try to liquidate it? Donate it? Store it? Recycle or even throw it out?

Each project is different and the answer depends on your circumstances. Decisions rely on cost analysis, along with how the various options align with your organization's social responsibility goals and values.

In this paper we present a model for estimating costs for the various asset disposition options while considering environmental and social impact.

Contents

Part 1 - Overview

Asset Disposition Options

There are five places for surplus furnishings to go: landfill, recycling, storage, liquidation, and reuse (through charitable donation). In practice, the solution may be a combination of two or more of these methods. In nearly all organizations, the goal is to minimize costs, while maximizing social responsibility in terms of environmental and community benefits.

Consider the options for your surplus:

Landfill

Nobody likes to see usable furnishings go to the landfill. Disposal is not necessarily the easiest or least expensive option.

Recycling

Many furniture types contain recyclable pieces, some of which can be sold as scrap metal. However, recycling usually involves additional labor for disassembly.

Asset Disposition Options *(continued)*

Storage

Storing decommissioned furniture only makes sense if it can be expediently sold or redeployed.

Liquidation

Obviously a desirable option, but most inventories have little of interest to liquidators, especially when the market is flooded with used furniture.

Reuse

Reuse ensures that furniture reaches its highest purpose and the process can be as easy as disposal. Environmental impact is low while community impact is significant.

Cost Factors

The chart below shows potential cost factors for the different asset disposition options. The model does not include labor for moving out of the building as labor would be the same for all options.

Note that there are two ways for accomplishing disposal or recycling. In the case of disposal, the items can be transported to the landfill where disposal fees are incurred. Alternatively, roll-off waste containers can be delivered to the project site. The same is true for recycling, although scrap metal may generate revenue and other materials, such as composite table tops, incur recycling charges.

	Landfill					
	Movers	Dumpsters	Recycling	Storage	Liquidation	Reuse
Labor:						
Load	-$	-$	-$	-$	-$	-$
Unload	-$		-$	-$		
Disassemble			-$		-$	
Transportation	-$		-$	-$		
Container Fees		-$				-$
Disposal Fees	-$		-$			
Recycling Fees/Revenue			-$ +$			
Liquidation Revenue					+$	
Storage Fees				-$		
Project Administration		-$	-$	-$	-$	-$

Social Responsibility Factors

The practice of social responsibility means that an organization is operating in ways that enhance society and the environment, instead of contributing negatively to them. Note that recycling's contribution to CO2 offset depends on the materials recycled.

	Landfill	Recycling	Storage	Liquidation	Reuse
Environment - CO2 Offset	—	+	+	+	+
Community Benefit					+

Part 2 - Cost Benefit Analysis

As seen in Part 1, each of the disposition options has two or more associated costs. In this section, we look at two sample analyses calculated with industry standard costs and revenue. Project management costs are roughly equivalent for each option and will not be considered in this model.

Note that these examples are intended to portray relative costs in specific scenarios. All projects are different and actual cost estimates will vary based on numerous factors.

Example 1- Corporate Office Furniture

Scenario

In this example, corporate office furniture has been decommissioned. Facilities management is considering all of the options. The inventory consists of a typical office mix of tables, chairs, cabinets, and common area furniture. The inventory will fill one tightly packed 53' trailer.

Capacity Equivalencies:

1	FRS container =	3	22' straight trucks =	4	30 yard dumpsters =	2	storage trailers

Inventory Specifications:

Total weight	10,000	pounds
Piece count	250	pieces

1. Disposal Option

The entire inventory goes to the landfill. 30 yard roll-off waste containers are brought to the site and loaded by movers.

Crew on site	6	crew members
Total load time	4	hours

2. Recycling Option

The recycling option considers the case where all recyclable materials in the inventory are disassembled and transported to a recycling center by the movers. The remainder is taken to the landfill. Income will be realized from the sale of scrap metal. Other materials, such as composite table and desk tops and certain plastics, can be recycled as boiler fuel or other raw material for a fee.

Percent of inventory requiring disassembly: 60%

Composition:

Metal (for scrap)	40%
Other recyclable	40%
Non-recyclable	20%
	100%

Crew on site	6	crew members
Total load time	4.5	hours

3. Storage Option

The storage option depicts the case where there is a possibility that the furniture may be redeployed or resold in the near future. In this case, two storage trailers are brought to the site, loaded, and then delivered to a yard to await their fate. The cost estimate does not include costs to transport and unload the trailers at their final destinations.

Crew on site	6	crew members
Total load time	3	hours
Anticipated time in storage	2	months

4. Liquidation Option

The only income producing option (with the exception of scrap metal income), liquidation is rarely an option for the entire inventory. This model assumes that a certain percentage of the inventory can be sold and that the remainder is recycled as per the recycling option described above.

Percent of inventory that can be liquidated	10%

5. Reuse Option

The reuse option assumes that the entire inventory is donated to a non-profit organization and can be loaded onto a single 53' tractor trailer.

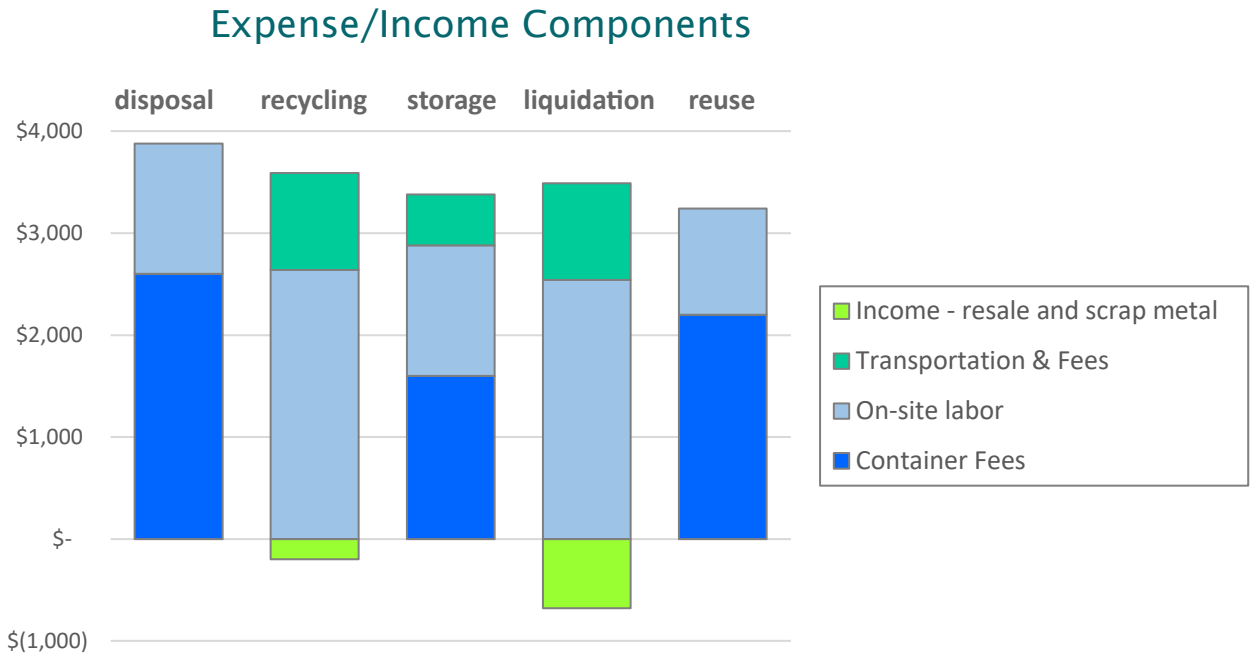
Crew on site	6	crew members
Total load time	2	hours

Cost Calculations

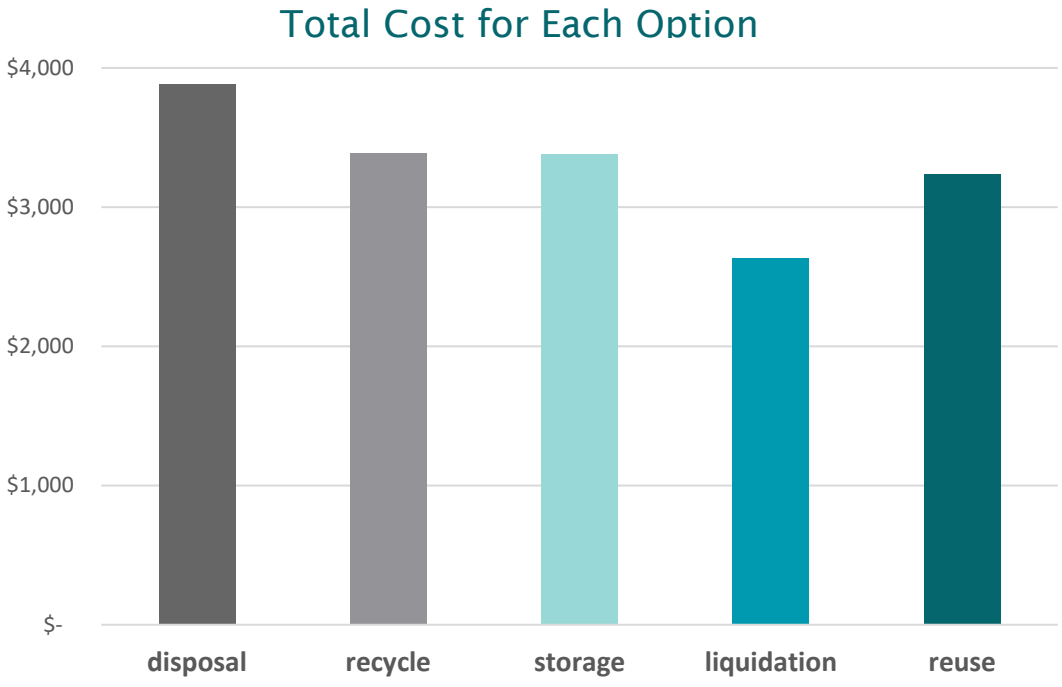
In order to understand the magnitude of the various cost factors, expense and income is categorized as follows:

- Containers - donation container, roll-off waste containers, or monthly fees for storage containers
- Site Labor - loading and disassembly (where applicable)
- Transport, fees and unloading (where applicable), - recycling/disposal option, storage option
- Income from resale (liquidation) and scrap metal

The graph below shows each cost element for each option. Reuse and disposal (via rolloff containers) are the least complicated options as they both only require container delivery and loading labor.



The total cost for each option is the sum of its components. As seen below, liquidation is the lowest cost option and disposal is the highest cost. Reuse has the second lowest cost, followed closely by recycling and storage. We can conclude that, under the assumptions of this example, all of the options are relatively close in cost. These options can be differentiated by their contribution to social responsibility, as well as the risks inherent to a project (covered in Part 3) that can significantly change the costs.



Example 2 - K-12 Classroom Furniture

Scenario

In this example, school furniture is being replaced. Facilities management is considering all of the options except liquidation (no U.S. market for classroom furniture) and storage (no future need for furniture in the school district). The inventory consists of student desks, chairs, and activity tables. The inventory will fill one tightly packed 40' international shipping container. The equivalent of the other kinds of containers are:

Capacity Equivalencies:

1	FRS container =	3	22' straight trucks =	3	30 yard dumpsters

Inventory Specifications:

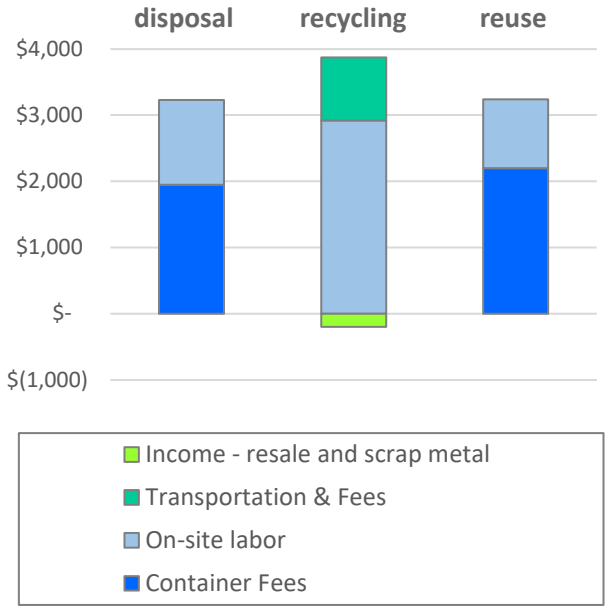
Total weight	10,000	pounds
Piece count	320	pieces

All of the other assumptions given in Example 1 apply to Example 2.

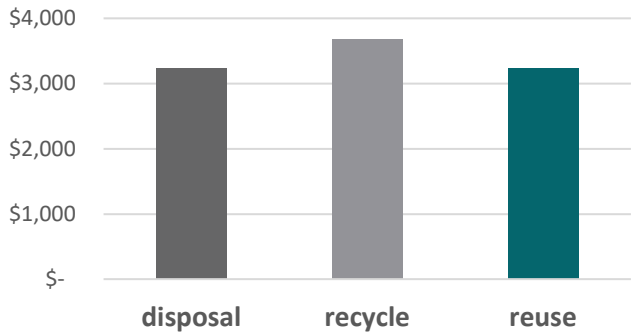
Cost Calculations

The results indicate that reuse and disposal are approximately equal in cost. Recycling costs are higher, primarily due to the additional labor required. As in Example 1, a good decision on the disposition of these items should consider cost, as well as risk factors and social responsibility contributions. Schools and their communities do not like to see usable furnishings go to the landfill. By choosing reuse, school districts can minimize cost and risk, while maximizing environmental conservation and helping communities in need.

Expense/Income Components



Total Cost for Each Option



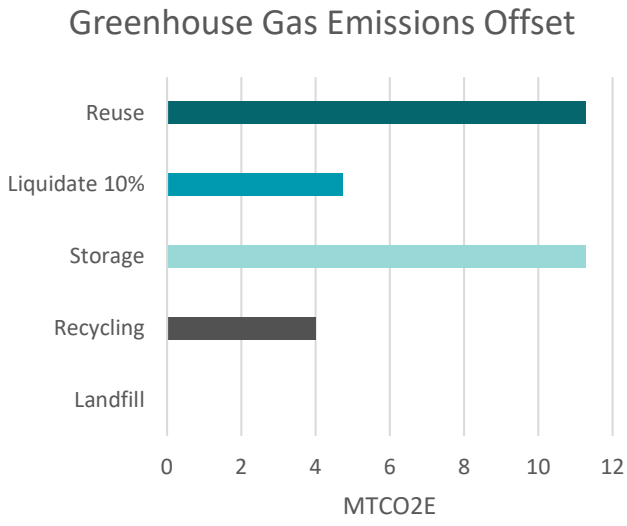
Social Responsibility Analysis

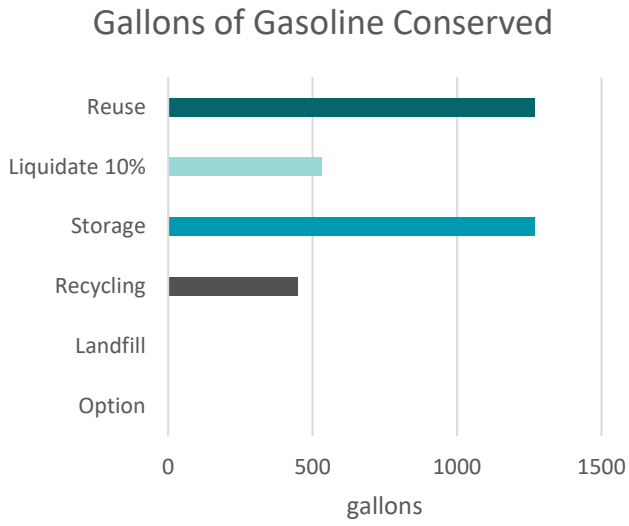
Environmental Impact

A rough assessment of greenhouse gas emissions can be determined by using the Waste Reduction Model Tool from the U.S. EPA[1] This tool calculates metric tons of carbon dioxide offset equivalent (MCO2E) for a baseline and alternative scenario.and the equivalency in gasoline conservation. The results presented here are based on the material composition of the inventory. These do not correlate exactly to the material choices available in the tool. However, the results will give an idea of the magnitude of difference among the various scenarios.

The calculations are based on national averages for landfill type and gas recovery. Note that the results do not include emissions from transportation to various destinations (warehouse, charity, etc.). The baseline scenario is the worst case for emissions- landfill. The results are the same for both examples:

Inventory Material Composition		weight (tons)	Material specified in WARM
Metal	40%	2.0	Steel Cans
Material for boiler fuel	30%	1.5	Medium Density Fiberboard
Other recyclable material	10%	0.5	Mixed Plastics
Non-recyclable material	20%	1.0	PVC (50%), Wood Flooring (50%)
	100%	5.0	





Clearly, the less that furniture is sent to a landfill or processed for recycling, the greater the environmental conservation.

[1] https://www.epa.gov/warm/versions-waste-reduction-model-warm#15

Community Benefit

Reuse through donation is the only disposition option that provides a direct benefit to disadvantaged communities throughout the world. Furniture is sent to charities and non-profit organizations who deploy it to schools, orphanages, community centers, healthcare groups, and thrift stores with humanitarian missions.

Part 3 - Risk Analysis and Conclusions

Potential Project Pitfalls

What could possibly go wrong? Ask any project manager and you could get a long response. Time is money and delays are generally the costliest risk factors. These projects are labor intensive and involve equipment and transportation, any of which can cause delays and increase costs. Some delays are unavoidable. Others can be prevented.

Another potential pitfall lies squarely in the realm of project planning, namely having an inaccurate inventory. The costs of physically having more product than projected ripple throughout the project: more labor, more equipment (containers, trucks), etc. Conversely, overestimating inventory can cause labor inefficiency (crew too large), unnecessary equipment rental, insufficient volume to meet donation minimums, and more.

Below is a sampling of potential risks on a decommission project. The likelihood and consequences of these events depend, of course, on how the project is implemented and which disposition options are chosen.

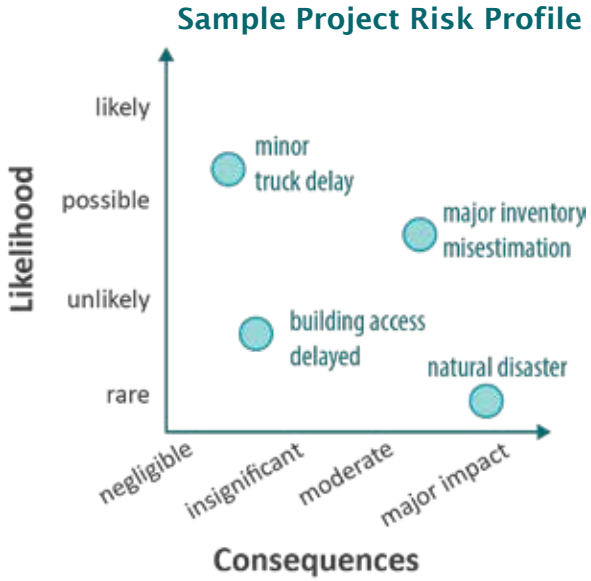
Sampling of Project Risks

Cost Element:	*Risk Examples:*
 Site Labor	Overstaffing Delays due to: Understaffing Inefficiencies
 Containers	Delivery delays due to weather, traffic, or supplier issues Container supply shortage
 Transportation, Fees	Delivery delays due to weather, traffic, or carrier issues Misestimation of landfill, recycling, or storage fees
 Project Planning/ Site Management	Building or truck access blocked Scheduling conflict with construction, other activities Misestimation of inventory - can impact all cost elements

Visualizing Risks and Consequences

The cost of risk can be calculated in a probabilistic model, but with so many causes and possible outcomes, the task is daunting. It is not usually necessary for a decommission project planner to specifically quantify risks, but it is necessary to be aware of the various risks of the options relative to one another. Each project will have a different risk profile, defined by the likelihood and consequences of an event.

Consider the chart of a sample risk profile. In this scenario, a decommissioning project is taking place in an area with frequent traffic congestion (possible truck delays) and construction concurring at the project site (potential building access conflict). The inventory counts have been fluid and subject to frequent change. Consequences range from minor delays (possible additional labor costs) to lengthy delays (caused by a major weather event or other force majeure). If the projected inventory is significantly underestimated, actual equipment and labor costs could be increased by the discrepancy percentage or more. Conversely, a gross overestimation could result in the unnecessary expense of underutilized equipment and labor.



To put the risk costs into perspective you can apply a rule of thumb Expected Value (EV) calculation. Think of Expected Value as an indicator or measure that will help you make better choices in uncertain situations. If you were to try to insure against these risks, the EV would be roughly equivalent to what an insurance premium would cost.

EV of risk = *probability of occurrence* **x** *cost of outcome*

For example, assume there is a 20% chance of a truck delay that would add $1,000 to the project's cost.

EV delay = 0.20 x $1,000 = $200

What if there is a 5% chance that the inventory is underestimated by 20%, which would result in an additional $10,000 to the project cost?

EV inventory error = 0.05 x $10,000 = $500

How about a one in one thousand chance that a major weather event could cost $50,000?

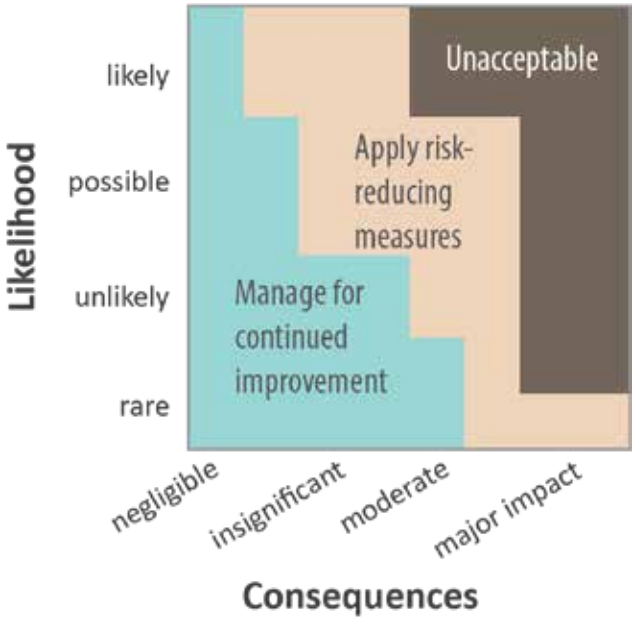
EV disaster = 0.001 x $50,000 = $50

By using EV analysis to weigh the potential risks against potential costs, you can better plan to manage and mitigate them. In this example, inventory management represents the largest risk exposure.

Managing and Mitigating Risk

The sample risk assessment matrix shown below indicates the type of action to take for each component of risk. The matrix is a tool for project planning, enabling teams to identify potential challenges and creating an action plan, should the risks become reality.

Sample Risk Assessment Matrix



Steps to take for effective risk mitigation:

- Thorough project planning involving the entire team, including responsible parties representing the facility, movers, and the other services which may include reuse, waste management, or liquidation.
- Visit the beforehand site to identify potential issues with crew and transportation access, and space for containers.
- Assign an experienced site manager to be present throughout the entire project.
- Use a checklist to confirm that all labor, equipment, transportation, and shipping documentation is ready to go.
- Confirm the inventory one week prior to project commencement. *Inventory drives the process!*

Conclusions

Social responsibility is a value that is changing the way that organizations operate. Social responsibility has become increasingly important to stakeholders who seek economic benefits but also contributions to the welfare of society and the environment. Aligned with the culture of an organization, social responsibility practices improve trust, relationships, and brand awareness.

Now we see social responsibility awareness percolating throughout furniture management projects, especially when asset disposition is involved. With more options to consider and social responsibility standards to uphold, furniture decommission projects require a new level of planning.

The first step in planning is to understand your options and the associated costs, risks, and upside benefits. Then select the ones that work best for your organization. When you know your inventory counts and schedule, then staffing and logistics can be set. Decommissioning projects involve multiple parties (furniture vendors, movers, environmental services providers, liquidators, etc.) and when they are all in synch, a well-run project is on the horizon. A successful project optimizes social responsibility (environmental impact and community benefit) while minimizing costs and risks. A positive project conclusion is achieved when surplus furnishings reach their highest purpose.