

Furniture Reuse Enterprise

Abhinav Chaudhary

Magesh Chandran

Mahesh Bhattad

Girish Kaushal

Arun Paul

University of British Columbia

MBA

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Prepared for
SEEDS Program
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Prepared by
Abhinav Chaudhary
Magesh Chandran
Mahesh Bhattad
Girish Kaushal
Arun Paul

Acknowledgments
Colin Gibson, Moving Crew
Liska Richer, SEEDS Coordinator
Kara Bowen, Coordinator, Sustainability Program

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Executive Summary

With the global community becoming increasingly conscious about protecting the environment and saving wastages from going to the landfill, the proposed *UBC Furniture Reuse Enterprise* will function as an entity that will collect, warehouse, and resell furniture that could be reused within the UBC community. The UBC community here will include all the 49 departmental buildings in the university, the staff, students and all residences in the UBC campus. Reusing old furniture will meet two critical needs:

- It will prevent reusable furniture from going unnecessarily to the landfill and help generate revenues by selling them to interested buyers.
- It will help realize cost savings for the various departments that would otherwise incur dumping charges.

The moving crew which currently operates under UBC's Plant Operations department collects an average of 50 cubic yards of furniture per month from various departments. With an average of 30 cubic yards of reusable furniture in it, owing to space constraints, only 10 cubic yards of furniture is warehoused and the rest 20 cubic yards of reusable furniture is moved to the dump site. The ones that are warehoused are communicated to the departments by word of mouth and interested buyers drop at the warehousing facility and buy them for cheap dollars. With increased promotions and awareness, there lies a huge opportunity to realize revenues and increase net savings to UBC.

With a potential to sell 20 extra cubic yards of reusable furniture, this new enterprise program will aim to collect additional furniture from UBC residences like Acadia Park, Gage, Fairview etc and sell them back to the community. The primary competition for this program

would be from websites like craigslist.org, vancouver.kijiji.ca, classifieds in regular newspapers and local second hand stores. Since the program's target segment is the UBC community, we will not compete for the broader Vancouver market. But we will price our products according to the competition and increase awareness towards saving the environment from increasing landfill.

There are around 6000 students relocating to Vancouver to study at UBC, and our market research revealed that 63% of the relocated students buy furniture and about 32% of them buy used furniture. The survey also revealed their interests to buy furniture like chair, desks, tables and file cabinets which aligns with the furniture that is right now being collected.

With an initial investment of \$5000, the program is expected to sell 40 cubic yards of furniture every month that will comprise an average of 108 units comprising an average of 36 chairs, 48 desks and tables and 24 file cabinets. Every cubic yard of furniture will generate \$48.9 of revenue and the program is expected to breakeven in the seventh month of operations which will require a sale of about 223 cubic yards of furniture. With an element of seasonality in operations owing to peak demands in admission months and low demands in holiday months, the income for the first year of operations is estimated to be \$8097. The enterprise will be able to create a value of approximately \$65000 and 480 cubic yards of space every year.

Proposed operations will additionally involve warehousing reusable furniture collected from residences, maintaining a new website that will serve as the prime sales channel, operating garage sales once a week and continually doing promotional activities to increase and sustain the awareness about the program.

1 UBC and Sustainability

UBC is reputed as global leader in sustainability being Canada's first university to adopt a sustainable policy, to open a Sustainability Office and to lead with innovative sustainable practices on campus. In 1990, UBC signed Talloires Declaration, a ten-point action plan for incorporating sustainability and environmental literacy in teaching, research, operations and outreach at colleges and universities¹.

The government of British Columbia set an example to rest of the world by committing to make its operations carbon neutral by end of 2010. This commitment, embodied by legislation is first of its kind in North America. This legislation mandates that all public offices, including universities, be carbon neutral by 2010. As a public institution, UBC is mandated to be carbon neutral by 2010. On March 13th, 2008, President Stephen J. Toope, along with BC's five other university presidents signed the University and College Climate Change Statement of Action for Canada. This statement commits UBC to commence a collaborative planning process to develop an institutional climate action plan².

UBC has achieved significance progress in reducing its carbon footprint by continuously committing itself to innovative programs in environmental sector. From 1999 till date, by introducing sustainable practices on Vancouver campus, UBC has saved³.

- 232,638,800 sheets of copy/printing paper
- 226,774,450 kWh of electricity and 34,916,705,000 litres of water
- 91,746 tonnes of green house gas emissions
- \$40,047,929

2 Need for Furniture Reuse Enterprise

One challenge that UBC currently faces is the large volume of office furniture that cannot be recycled or composted through conventional channels. As a result, furniture, such as desks, chairs and file cabinets are typically sent to the landfill, contributing to water and air pollution, and climate change. On top of this heaping challenge is the fact that UBC has to pay for dealing with all this furniture, including storage, staff and transportation associated costs. As a result, UBC is faced with not only environmental but also socio-economic challenges.

The office furniture mostly consists of two types of materials: wood and metal. According to statistics from waste management, the total waste generated in UBC in 2007-'08 contained 114MT of wood and 146MT of metal⁴. UBC has incurred an expense of \$17,000 for dumping this wood and metal waste⁵. 114MT of wood waste could release 210MT of CO₂ into the atmosphere⁶.

A well functioning reuse system on university campus could divert majority of wood waste from being dumped to landfill. It reduces pollution and saves the energy and cost that would be otherwise used to make new substitute product.

3 Reuse Operations today

Currently at UBC the reuse operation is managed by volunteers of Moving Crew in Plant operation department with the support from senior management. Whenever a department wants to dump the furniture, they call the moving crew which then moves the reusable furniture to the waste management warehouse, making it available to potential buyers. The damaged furniture is

moved to the dump yard. There is no proper mechanism to inform potential buyers of this available furniture. Due to the lack of storage space, reusable furniture often gets dumped in the landfill.

4 Business and Product

Furniture Reuse Enterprise is the Reuse business on UBC campus that collects Reusable furniture from University campus and sells to customers. It will be a sustainable alternative to the adhoc reuse operations that exist on campus now. Furniture Reuse Enterprise will be a new entity under Plant operations that will facilitate the re-use of disposed furniture. The Furniture Reuse Enterprise will adopt triple bottom line of “people, planet and profit” while it pursue the goal to maximize the social, economical and ecological benefits to all its stakeholders. This entity will take the responsibility to promote and create awareness about this reusable furniture, thereby reducing the amount of furniture that goes to the dump yard. The cost savings in dumping fees, along with the potential of generating revenues by selling the furniture makes the business model economically viable and environmentally sustainable.

5 Market Research and Analysis

The primary objectives of the Market Research were to segment the market, estimate the size of targeted market segment and understand customer preferences. It is also imperative, to find out the amount of reusable furniture dropped by UBC Departments, on a regular basis. A further study was done to understand the operations of similar businesses, carried out in different Universities in Canada and The United States.

5.1 Market Segmentation

A perceptual map of the furniture business is given in Appendix 1. The functionality of the furniture is plotted on the vertical axis and price is plotted on the horizontal axis. Functionality of furniture implies the extent to which it suits its original practical purpose. The customers who seek high quality and luxury furniture buy it from new furniture businesses while those who are willing to compromise the functionality at the benefit of low prices buy it from used furniture businesses. The used furniture business, which is now focused on the lower left corner, can find more customers if it could be extended towards positive vertical axis by offering products with higher functionality. Also, more customers would be willing to switch to used furniture if there is awareness about the positive environmental impact.

The customer, who wants to buy used furniture, considers three factors to choose the furniture store: price, variety and accessibility. A perceptual map of the used furniture business with variety and accessibility as buying criteria is shown in Appendix 2. It is assumed that all used furniture is competitively priced. The web intermediaries like Craigslist offer more variety of furniture, but most of the time, location of the seller would be far away from the customer. The customer who owns a vehicle and has plenty of free time to check various products would be willing to use such web intermediary services. The customer who doesn't have easy transport facility and is ready to compromise on variety would buy used furniture from nearby brick and mortar stores. UBC Furniture Reuse Enterprise provides only office furniture as of now and it's highly accessible to on-campus residences and neighborhood communities. As shown in the perception map, this business can increase its number of customers by increasing the variety of reuse products.

5.2 Customers

The customers of the Furniture Reuse Enterprise are university departments, staff and students of the university staying on campus and in neighborhood communities. Every year thousands of students gain admission to UBC and relocate to either the university campus or in its proximity. The UBC Furniture Reuse Enterprise would be an ideal fit for these students.

5.3 Primary Market Research

A market survey was conducted to estimate the demand for used furniture among students. The questionnaire was distributed among a sample size of 115 students. The sample contains a good mix of graduate, undergraduate, international and local students. The summary of survey results is given in Appendix 5.

According to the survey, 63 out of 115 students were relocated this year and 43 of them bought furniture after relocating to Vancouver. Among the students who bought furniture, 51% chose to buy used furniture. Currently, the Furniture Reuse Enterprise sells only office furniture such as chairs, desks and file cabinets. In the survey, 78% of the students indicated that they want to purchase at least one of these items. 62% students have expressed interest in buying an office desk or table.

Expert interviews with Colin and Dean Shorounis¹¹, Moving Crew were conducted to collect information on existing operations and to gain insight into demand and supply of reusable furniture. Continuous availability of surplus furniture and demand for used furniture is essential to sustain the business for the long term. Currently the departments drop 50 cubic yards of surplus furniture every month to the MRF site. An approximate break down of yards into furniture is given in Appendix 11. Colin has been voluntarily doing the task of diverting good

and used furniture to waste management storage space. Currently he could divert 10 cubic yards of furniture from the MRF site and give it away to customers. According to Colin and Dean, there is potential to save 40 cubic yards of more furniture every month if there's more space. Faster inventory turnover and better space utilization would enable the enterprise to operate with monthly sales of 50 cubic yards. The transfer of used furniture that is diverted from landfill is currently done on a voluntary basis and transactions are not entered in the books.

Interviews with facility managers of various university departments were conducted to collect expert opinions. As far as reuse business is concerned, the university departments act in two different roles. They act as suppliers, when they give surplus furniture to the enterprise and they act as customers, when they buy used furniture from the enterprise. Facility manager of a department takes care of all furniture needs of a department. The information we collected from administrators of 3 building facilities¹² is summarized below.

- Some departments have yearly allocation of budget to buy new furniture. The set of new furniture coming every year will push out older furniture from the department facility.
- A department dumps 3 cubic yards of surplus furniture on average every month
- During refurbishment, a department dumps the furniture in bulk.
- Some departments have shortage of furniture budget and they are interested in buying used furniture.
- Currently, many departments exchange used furniture on campus. But it's not organized and communication happens by word of mouth.
- The 3 departments interviewed invariably feel the need for a Furniture Reuse Enterprise, where they can drop and buy surplus furniture.

- The 3 departments interviewed have suggested the necessity of a website for easy communication.¹²
- Most of the departments in UBC have accepted sustainability as their core value and are promoting reuse and recycling.

5.4 Secondary Market Research

A quantitative research on student population and UBC departments was carried out using the data available from Planning and Institutional Research⁸, UBC. The result of quantitative research is given in Appendix 7. In total, there is a student population of 46,789 in UBC. Approximately 10,579 are newly admitted to UBC every year and 6,082 out of them are from outside Vancouver. After taking up admissions, they relocate to either on-campus residences or neighborhood communities.

In total there are 49 departmental buildings on campus⁹ with variable demand for furniture.

A qualitative research was done on 11 Universities in North America who have put reuse business into practice. 3 of them are in Canada and 8 of them are in United States. The information collected from qualitative survey is summarized below. Please refer to Appendix 6 for more detailed results.

- 9 of 10 Universities have full-fledged surplus stores open on all working days and sell all surplus items available on campus. The items include furniture, computer peripherals, electric appliances, office stationary and other rare items like antique books.
- Other Universities conduct weekly sales to dispose the surplus items.
- 3 of 10 Universities have contracted with eBay to sell items online.

- 1 of 10 University use social networking sites like facebook and twitter to publish updates on new arrivals and sales.
- 7 of 10 University offer paid pick-up and drop-off services inside campus.

Lionel Johnson, University of Calgary¹¹ informed that the weekly surplus sales generate revenue of 2800\$ per month on average. But the surplus business in this University, works as a part of supply chain management department as a way to get rid of surplus materials from the campus. The surplus business doesn't have separate budget or separate workforce and the money generated from sales go back to the overall budget of supply chain management department. He feels that independent surplus business will not be feasible in his campus without university aid, because the money generated from surplus sales is not be enough to pay the staff.

Ruth Daoust, University of Oregon¹¹, said that the money saved by departments by diverting surplus items from landfill, justify the operations of surplus store in their University.

The Surplus store of Michigan State University (MSU) has been in this business since 1920¹³. The MSU Surplus Store is responsible for the disposition of all university surplus property and provides managed storage services to university departments. Their vision is to become the premier university or college "Surplus Store" in the nation through being resourceful, creative, and providing friendly, responsive customer service. There are a large variety of items for sale, many of which are unique or not readily available elsewhere. The typical inventory includes office and residence hall furniture, lab equipment and supplies, vehicles, computers, farm equipment, books and much more.

The MSU Surplus Store also provides several services that support reuse and recycling on University Campus. These initiatives include e-waste, toner and ink cartridge, book and scrap

metal recycling. They have an e-commerce website that facilitate online purchase of items. The MSU Surplus Store is a self-supporting department at Michigan State University. Operating expenses are paid out of a percentage of revenue produced from the sale of surplus goods. Each year the MSU Surplus Store returns over 1 million dollars to MSU departments for the consigned sale of their items. Apart from that, it saves 20% of University's annual landfill expenses. Another distinct feature of MSU Surplus Store is the way they leverage social media for promotional activities. They use facebook, twitter and blog to regularly send information on new arrivals, sale and promotional offers. The Surplus store has been selling items through ebay website since 2000 and is graded as top-rated seller by its customers.

The surplus stores of University of Iowa and University of Missouri too have top rated ebay accounts, which help them to get best deals through auctions and sell items even when their brick and mortar store is closed¹³.

5.5 Market Size and Trends

Data collected from Market survey is used to estimate the market size among student population (Appendix 5). In this year at-least 2200 students on campus and neighborhood communities have bought furniture¹⁰. At least 7000 students are willing to buy furniture from Furniture Reuse Program in UBC when it's operational.

Also, it's evident from primary research that there is substantial demand for furniture among university departments.

Used furniture is treated as inferior good. The demand will not go down during economic recession. With growing student population size and growing awareness on sustainability the market size is predicted to increase in future years.

5.6 Competition and Competitive Edges

The business does not expect any competition, while targeting the market segment that contains student, staff and Departments of UBC. Furniture Reuse enterprise would be the only entity on UBC campus that deal with surplus materials.

The business might face some competition, if targeted customer could find furniture sellers in the vicinity of campus through intermediaries like Craigslist, kijiji, classifieds in regular newspapers and local consignment stores. But the Furniture Reuse Enterprise would have competitive advantage of brand reputation and low prices. Porter's analysis for the reused furniture business is shown in Appendix 9. The Reuse Enterprise can attract more customers if it can increase the scope and offer more variety of surplus materials in the future.

5.7 Estimated Market Share and Sales Projection

With the given market size and competition, it can be safely assumed that all furniture dropped by the departments would be sold within a month if the business operates with the proposed marketing plan (Section 6).

To begin with, the business would able to sell 25 cubic yards of furniture (Refer Appendix 20 for breakeven analysis) on average in a month. By promotions and spreading awareness the sales are expected to go to 40 cubic yards. Also, it is expected that sale of furniture would be higher in the months when the winter and summer terms start. Please refer to section 7 for sensitivity analysis and break-even analysis.

6 Marketing Plan

6.1 Segment

As stated earlier, the primary competition for reuse furniture would be from websites like craigslist.org, vancouver.kijiji.ca, classifieds in regular newspapers and local second hand stores. Since our service focuses on helping the UBC community we will not compete for the broader Vancouver market. Instead, we will establish ourselves as one of the brands under the UBC umbrella and establish a niche position in serving this particular segment of the Vancouver reuse furniture market.

6.2 Product

Chairs, desks / tables, file cabinets, couches and other rarity items like foosball and ping pong tables would comprise the variety of furniture items that will be sold. They would either be a collection from the ones disposed from individual departments in UBC or from the resident students/faculties in the UBC residences like Acadia Park, Thunderbird, Totem Park, Fairview, and Gage. They would not be altered for any modifications and will be sold as such to the next willing customer. However all of them would have gone through an inspection process before being tagged for sales.

6.3 Pricing

Prices in craigslist.org and local thrift stores were looked up to determine the range of prices for reused furniture. While prices in craigslist were set by the sellers, local second hand stores set their own prices. In craigslist, file cabinets were sold in the price range of \$20 to \$80, desks and tables in the range of \$25 to \$150, and chairs in the range of \$12 to \$25. In local stores the prices averaged \$15 for chairs and \$35 for desks and tables. In common, the prices varied

based on the dimensions, the relative newness, the extent to which it was reusable and the manufacturer/brand that made the furniture.

Slab Pricing: With regards to pricing in our case, our competitive stance will be cost leadership and we will place our products relatively low to our competition as the main purpose of the project is to increase the re-usable value. Each of our product categories will be classified into 3 segments of High, Medium and Low and prices will be set categorically. The low segment will have the lowest of the price range, the medium segment will have an average range and the high segment will have the highest price range. On an average, the prices will be set at \$12 for chairs, \$25 for desks and \$20 for cabinets.

Slashed pricing: When inventory does not sell over a period of 2 weeks, the space it occupies prevents other potential sellable furniture that could be warehoused in the same period of time. To overcome this inventory holding cost and the opportunity cost on other inventory, we will also adopt a slashed pricing model. Inventory that is not sold over a period of 2 weeks would be slashed at 25% its original price and for every other week it would be slashed at another 25%.

6.4 Distribution

Sales will be done via an open garage sale process for students and via direct delivery for departments. The open garage type sales will be done once in a week where the warehouse will be opened up for students to come directly and make their purchases. For individual departments in UBC, the respective facilities will have to call up Furniture Reuse Enterprise to have the moving crew deliver the furniture directly at their doorsteps. The listings for the furniture available will be hosted on a website that will be made accessible to the students and departmental faculty.

6.5 Promotion

With environment protection and green initiatives increasingly gaining popularity, our program will have a competitive edge in garnering the interest of students and faculty. In the process, it will help the community to join the movement towards reuse that would otherwise cause pollution. Our value proposition statements will orient towards this goal and will aim to create a sustainable community that supports this initiative in the long run.

Our promotional strategy will involve the following.

- a. Publicity/Awareness: A new website will be created under the UBC domain and all listings about the furniture available will be posted on the website. A link to this website will be made available on the admissions page of all departments and in the housing website for UBC. Since the preference from market survey indicates the need to publish the postings on my.ubc.ca and Facebook, regular inventory updates will be posted in those media. The website database will stay as the central repository of inventory information whereas my.ub.ca and facebook will serve as different interfaces to this information. The facebook page is intended for student segment while my.ub.ca is made for both student and staff segment. Information about the furniture reuse program will also be communicated to prospective students via admission acceptance letter packages and via Students Guide given to them on the first day of classes.

The listing of furniture for sales will be routinely updated on the website and also posted in SUB and VILLAGE notice boards. The listings will contain price, picture and summarized information on selected products and general information on the rest of the products.

A facebook group will also be created and RSS feeds from the new website will automatically update the group with the latest furniture listing.

- b. Advertising: We will have promotional pamphlets posted in the notice boards of libraries, food courts and all individual departments like art, science, law etc. The promotional pamphlets will also be made available in admin offices of all the UBC residences.
- c. Branding: The program would be branded as an enterprise program under the hood of UBC and will aim to deliver a value proposition that helps both sellers and buyers to save valuable landfill space. All promotional attempts via websites and notice boards will have the value proposition statement in them and communicate the vision of the program in way that induces more participation from the community.

6.6 Marketing Calendar

Since the sourcing for reused furniture is from students and departments, the amount of furniture disposed can peak during admission months and can be low during other periods. Hence a proper marketing calendar will be put in place to ensure high promotional activities during admission months and sustainable promotions in off-season months.

6.7 Sales Strategy

Our sales will be relatively straight forward. We will strive to get the word out about reusable furniture to all of the UBC community, educate them about the value addition it brings and ensure that the program sells itself.

6.8 Sales Forecast

It is estimated that the enterprise will be able to sell the available furniture throughout the year. It is estimated there will be monthly sale of 40 cubic yards of furniture. Looking at the

response from the market survey, it is believed that there will be more demand for re-usable furniture available at lower prices. But the supply will be limited to availability of dumped furniture by university department and university residencies. The numbers from the current 10 cubic yard figures have been used to project for the 40 cubic yards per month and 480 cubic yards per year.

7 The Economics of the Business

7.1 Investments

In order to setup the Furniture Re-use Enterprise, several costs will be incurred in terms of launch of new website, promotional activities, stationary needed to maintain easily accessible inventory, a camera to upload pictures, a computer. In addition to this, there will be other expenses such as monthly website hosting charges, wages of employees, trainings and other maintenance activities. The initial one-time cost to set up the enterprise is estimated to be \$3790. The details of these costs are given in Appendix 12. The project will start with an initial funding of \$5000 from the Sustainability Office at UBC.

7.2 Gross and Operating Margins

The input raw material for the Furniture Reuse Enterprise will be furniture dumped by various departments and by people residing in UBC communities. Out of these, only that furniture which is in usable form will be provided to the Furniture Re-use Enterprise by the moving crew. As such, the input cost for the enterprise would be zero. So all the revenue generated by the enterprise will be its gross margin.

For departments, they will be saving on the dumping charges that would be otherwise incurred on them if the furniture was not re-sold. This would also serve as an incentive for them to let Furniture reuse Enterprise sell the dumped furniture.

7.3 Fixed and Variable Cost

As there is no input cost associated with the sale of furniture there are no variable costs present for the business.

To store the good quality incoming furniture, a warehouse will be required. Monthly maintenance activities will be needed to maintain the furniture and sort it accordingly so that any furniture present in the warehouse is easily reachable. It is estimated that efforts of two people will be required on a part time basis to maintain the warehouse. This will be the highest fixed cost of all. The total monthly fixed cost will be \$1280 and what it is based upon. (Please refer Appendix 13: Monthly Income Statement)

7.4 Breakeven Point

As per the sales mix calculation shown in Appendix 11, every cubic yard of furniture will generate \$48.9 of revenue. So, with sales of 40 cubic yards of furniture every month and considering all the fixed costs associated for every month, it is estimated that the enterprise will break-even in the 7th month. This will require sale of about 223 cubic yards of furniture.

7.5 Income Statement

Appendix 13 shows the pro forma income statement for Furniture Reuse Enterprise shows that barring the initial investment, the enterprise will be profitable from the first month itself. The factor of no input cost on acquiring the furniture can be attributed to this. Also the income generated will have some elements of seasonality in it, i.e., more furniture is expected to

be sold to students during beginning of semesters when new students actually arrive to Vancouver for the first time. Appendix 14 shows the pro forma income statements for the first 5 years of operations. The income for the first year of operations is estimated to be \$8097.

The income for all subsequent years will also remain within this range, as profit maximization is not the ultimate motive of this enterprise. The ultimate motive is to generate reusable value from furniture that was supposed to be dumped.

7.6 Cash Flow Statement

Appendix 15 shows the pro forma cash flow statement for Furniture Reuse Enterprise for the first five years. It can be observed that the enterprise generates positive cash flows from the first year itself. It shows that the operations are sustainable from the beginning and will not need any further investments. Cash generated from the enterprise can be used to widen its scope and to support buying and selling of other re-usable items as well.

7.7 Sensitivity Analysis

Appendix 21 shows that to remain sustainable in its operations, with the current prices, FRE will be required to sell at least 25 cubic yards of furniture every month. If it sells below this quantity, losses will be incurred and the enterprise might require further investments by the university to continue its operations. Even though the value generated will remain positive, extra money will be required to sustain the operations.

In case the department is able to sell more than 40 cubic yards of furniture every month, which also depends on quantity of re-usable available, prices of these furniture's can be reduced further for the benefit of departments and students.

7.8 Value Created

Appendix 18 shows the total value generated over the period of five years. As this is the ultimate motive of Furniture Reuse Enterprise, it is important to look at the total amount of value created. To calculate this alternative furniture purchase options for departments and students was considered. In absence of Furniture Reuse Enterprise, departments will be purchasing new furniture as per current practices. Also, students who prefer second hand furniture will be purchasing it from other shops in Vancouver. As Furniture Reuse Enterprise is making them available used furniture at cheaper prices, it is generating potential savings for them. Also, by re-selling furniture that was supposed to be dumped, FRE is saving dumping costs that would have been charged to departments. There is also saving of precious land space that would have been required to dump this furniture.

After considering all above factors, it is estimated that the dollar value generated for UBC by the enterprise over the first year will be worth \$62717 along with 480 cubic yards savings in land space (Appendix 17).

8 Operations

8.1 Current operations

At present Plant Operations of UBC handles all the waste generated in UBC. The waste is categorized into three types: wood, metal and miscellaneous. This waste consists of both reusable and damaged chairs, tables, and file cabinets.

The department that wants to dispose the furniture calls the moving crew, who picks up the furniture, shifts the good furniture to the warehouse and dumps the damaged furniture to the MRF dump site. The source department pays the moving crew an hourly rate of \$49 and also

pays the MRF site a dumping fee that depends on the quantity of furniture being dumped. Students and other residents in the UBC campus either sell their furniture through craigslist or dump their furniture in different waste bins located in the campus, which the moving crew picks up once a week. But this furniture directly goes to the dump site (see APPENDIX 1).

The quantity of waste collected in a month at present is around 50 cubic yards containing approximately 30 cubic yards of reusable furniture. But due to limited storage space of 10 cubic yards in the warehouse, 20 cubic yards of re-usable furniture ends up in dump site. The demand for furniture from students can be seasonal. It is expected to peak during the months when a term begins and remain a bit lower during other months. But the demand from departments is quite constant.

8.2 Proposed operations

When a department wants to dispose off the furniture, it will call the moving crew to move the furniture out of their buildings. When the moving crew collects the furniture, during the loading process they will group the furniture that can be reused and keep it separate from the ones that will be not be reusable. The grouped ones will be dropped off at the warehouse and the rest will be taken directly to the dump site.

In the case of UBC residences, the waste management crew will collect the furniture left near the garbage bins. In a fashion similar to the moving crew, while loading the furniture into their trucks they will group the reusable ones separately and leave them at the warehouse while the rest will be taken to dump site.

8.3 Storage

With the furniture collected from residences along with the ones from the departments, the combined potential reusable furniture is estimated to be 40 cubic yards (Please refer to 5.3 Primary Market Research to for this estimation). So we will begin operations under this new unit of Furniture Reuse Enterprise with 50 cubic yards of warehouse space, keeping in mind the increased demand during some months.

At the warehouse, the staff will tag the different furniture that arrive newly and segregate them into 3 different segments namely low, medium and high price based on the condition of usability, the relative newness of the furniture and the maker/brand of the furniture. The purpose of tagging is to easily identify the source and keep track of the rate of turnover of furniture. After the tagging process, the staff will created a consolidated list of the furniture available for sale. Complete check of inventory will be planned twice a year, just before the start of a new term on campus.

8.4 Selling

There will be an open garage sale which will be conducted once every week. The students or staff willing to buy the furniture will be allowed to visit the warehouse on the day of the sale. After they make a purchase, the students will be responsible for taking the furniture back to their place. When selling to departments, departments will call up the reuse enterprise office anytime during office hours and place an order for purchase. The furniture will then be sent to the departments with the help of the moving crew.

In case if any furniture remains at the warehouse for more than two weeks from the day of arrival, their prices will be slashed by 25% and then later by another 25% for another week. If

the furniture has no takers even after one month the furniture will be dumped in the dump site and the department which had disposed off that piece of furniture will be charged the appropriate dumping fees. (see Appendix 2 for proposed plan).

8.5 Staff

There will be two staff who members who will be in charge of the new furniture reuse facility. They will be the new contact points for departments to call them for disposal of furniture or for purchase of new furniture. They will then have to coordinate with the moving crew to get the furniture transported. On arrival of new furniture, their job will involve to sort the furniture into the 3 segments namely low, medium and high and tag them with proper identification details and price. They will create a consolidated list of furniture that exist in the warehouse and post them on the website. They will also send the update list once a week to the SUB and VILLAGE notice boards. Since the warehouse facilities in UBC have to abide by safety regulations, they will also be responsible to regulate the buyers who come on the day of the garage sales to abide by the rules. They will be responsible to keep track of the sales and report the revenue details to the accounting department of Plant Operations.

9 Human Resources and Organizational Structure

9.1 Human Resources

As a part of the initiative to carry the activities of the Re-use enterprise, 2 part-time student workers will be hired. These students will work together with their functional roles clearly specified to them. They will need to carry out all the promotional activities, maintain well organised inventory as well as co-ordinate with various departments and the moving crew.

But as the positions are for part-time work, it is expected that employee turnover will be high. So it is necessary to create and keep in place all training modules so as to familiarize the new employees with the required processes. This will help make transition of work from one employee to another in a smoother way.

Also, as the process involves high degree of communication with the Moving Crew and Waste Management department, combined trainings of with employees will be scheduled. Necessary trainings will be provided to the moving crew and waste management crew to help them differentiate re-usable quality furniture from other ones.

9.2 Organizational Structure

As given in the figure 4, the new re-usable furniture enterprise will be placed under the same level as Waste Management Centre and Moving Crew and all three will be placed under the umbrella of UBC Plant Operations.

10 Major Risks

- Re-usable Furniture market decline

There is always the risk of a decline in demand of re-usable furniture because of a decrease in the student resident population at UBC and this decline in the demand will directly impact the revenues of this enterprise.

- Lack in Supply of Re-usable Furniture

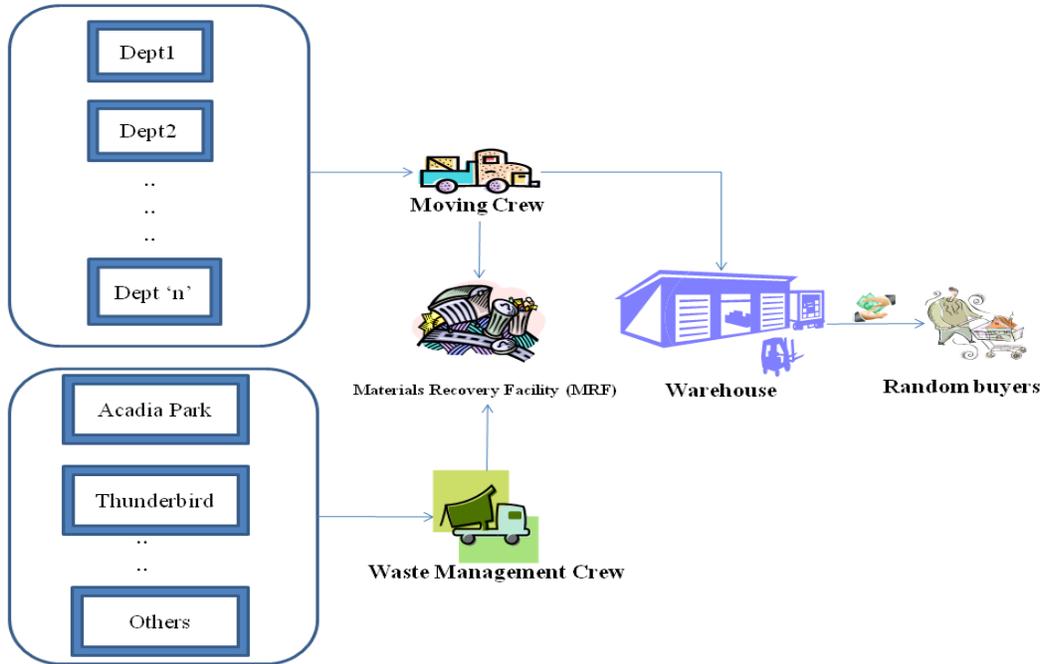
If the supply of the furniture from different departments and the students declines, then there will be lesser amount of furniture available to be sold or if the re-usable furniture supplied by the departments or the students are of low quality then there will be few takers for that furniture and ultimately it will impact the revenues of the enterprise.

- UBC's Hierarchical Structure

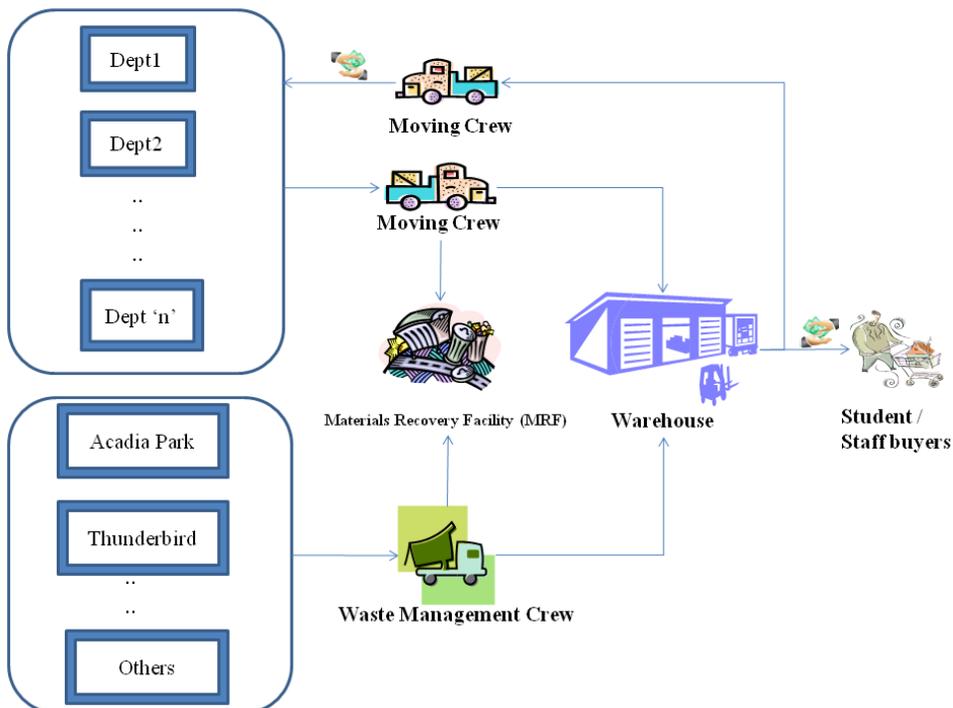
The enterprise is part of UBC. Any major change or a decision that will be taken will have to go through approval process of the board, which can be slow as well as time-consuming.

11 APPENDICES

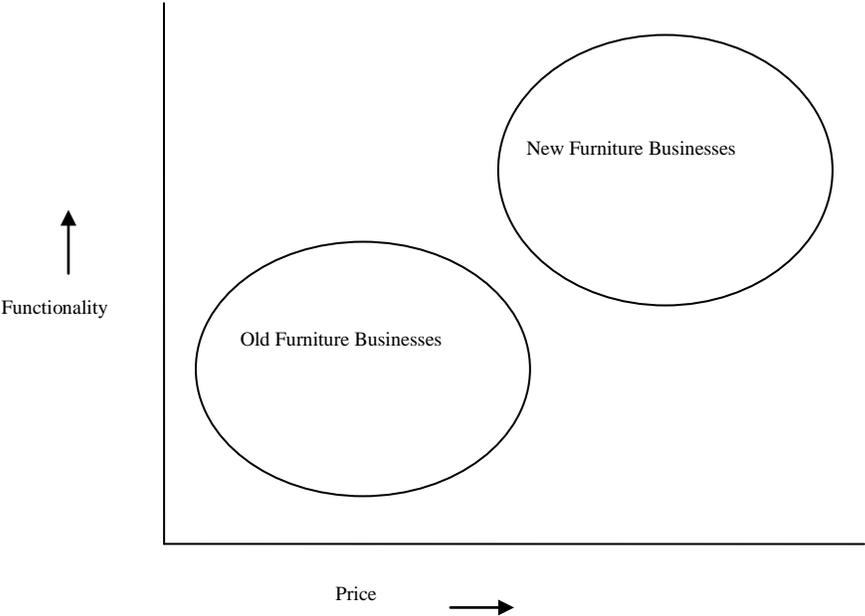
11.1 APPENDIX 1: Current Operations



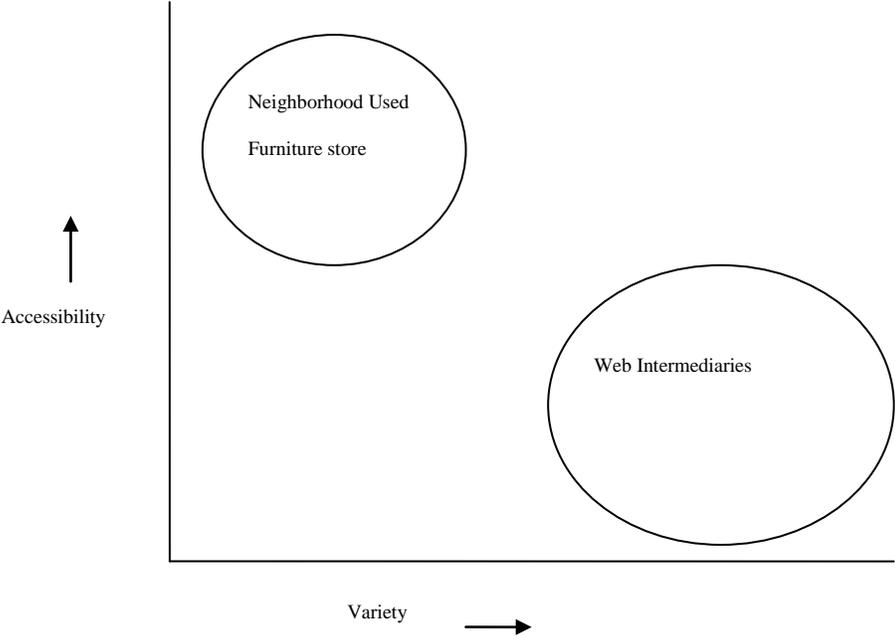
11.2 APPENDIX 2: Proposed Operations



11.3 APPENDIX 3: Perceptual map of Furniture Market



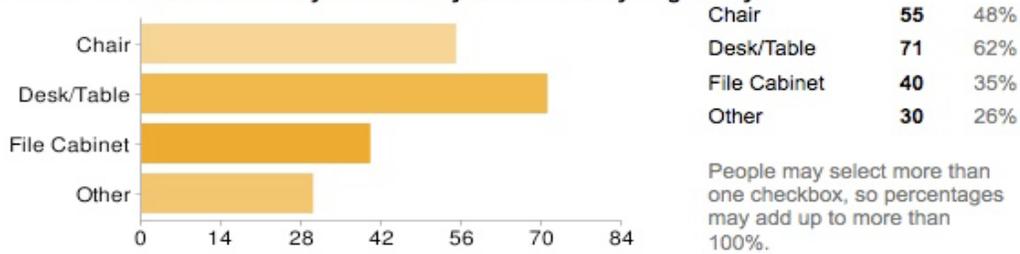
11.4 APPENDIX: 4 Perceptual Map of used furniture market



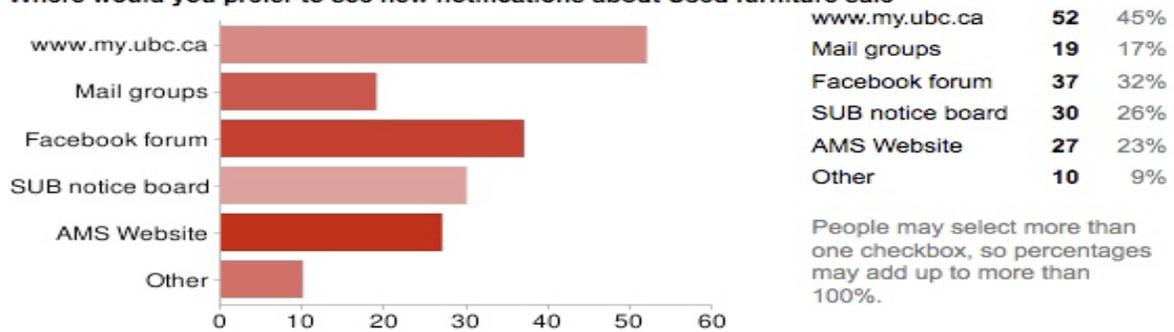
11.5 APPENDIX 5: Primary Market Survey results

Results of market survey						
	Sample size	Sample %	Population	Margin of error	Minimum Demand	Maximum Demand
Total response	115		10579			
Students Relocated	63	55%	6082			
On Campus	37	59%				
Off Campus	26	41%				
On Campus	15	35%				
Off Campus	28	65%				
Students who bought furniture	43	37%				
Used	22	51%				
New	21	49%				
Students who bought used furniture	22	19%				
On Campus	10	45%				
Off Campus	12	55%				
Student who relocated and bought furniture	30	48%		10%	2288	3504
Used furniture	22	19%				
Delivered by seller	6	27%				
Delivered by buyer	16	73%				
Students who want to buy used furniture from UBC	90	78%		10%	7221	9337
Delivery						
Willing to pay for Delivery	74	82%				
Expect free Delivery	8	9%				
Ready to arrange Delivery	8	9%				

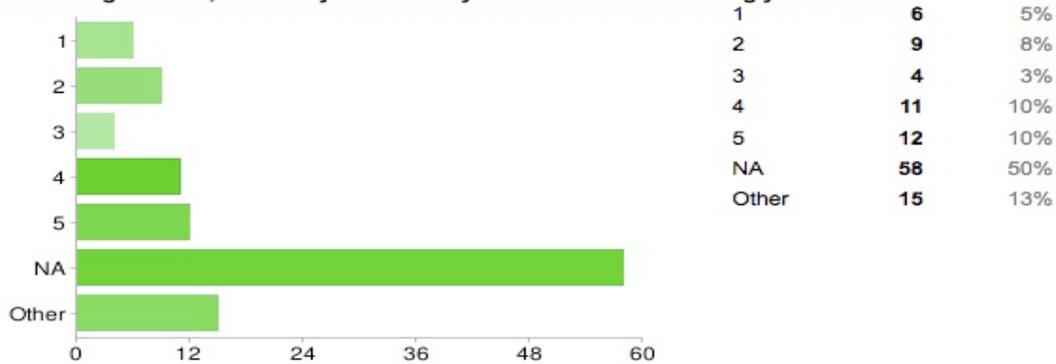
What kind of furniture would you like to buy from UBC Recycling facility?



Where would you prefer to see new notifications about Used furniture sale



In a rating of 1 to 5, how many times were you successful in reselling your furniture?



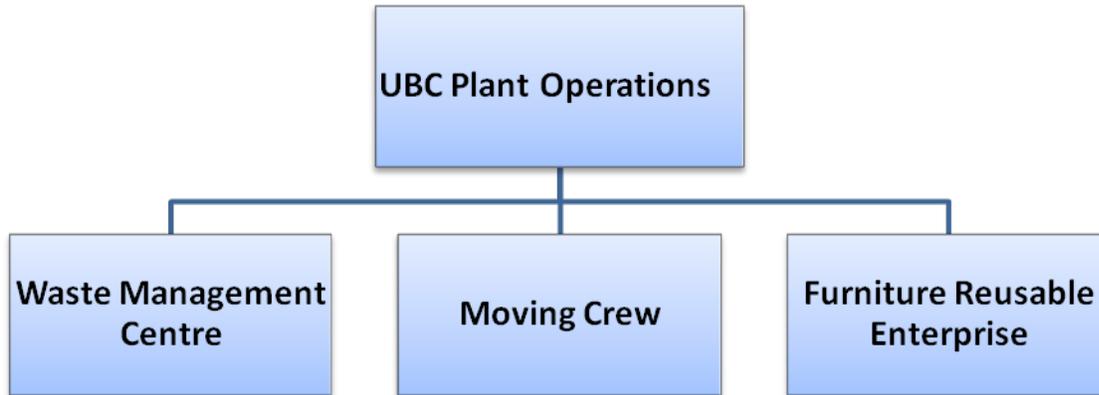
11.6 APPENDIX 6: Secondary Market Research

SECONDARY MARKET RESEARCH					
University	Store space	Marketing channels	Sales channel	Customer service	URL
University of Oregon				Paid pickup	http://surplus.uoregon.edu/
Michigan State University	Yes	Website, facebook, Blog, twitter	Store, eBay	Free pickup, Paid Delivery	http://www.msusurplusstore.com/servlet/StoreFront
University of Wisconsin	Yes	Website	Store	Pickup and Delivery on campus	http://www.uwsp.edu/Surplus/Default.aspx
University of Iowa	Yes	Website	Store eBay	Delivery available within the Iowa City (\$30 dollar per truckload fee).	http://www.uiowa.edu/~fusmm/surplus.html
University of Utah	Yes	Website	Store	Free pickup	http://fbs.admin.utah.edu/index.php/surplus/
University of Washington	Yes	Website	Store	Paid pickup	http://www.washington.edu/facilities/transportation/movingandsurplus/
University of Missouri	Yes	Website	Store, eBay	Paid pickup	http://www.surplus.missouri.edu/
Indiana University	Yes	Website	Store	Paid pickup	http://www.indiana.edu/~surplus/
Simon Fraser University	Yes	Website	Store	Paid pickup	http://www.sfu.ca/policies/admin/ad11-10.htm
University of Calgary	No	Website		Paid pickup	http://www.ucalgary.ca/scm/surplus
University of Saskatchewan	Yes	Website	Store	Paid pickup	http://facilities.usask.ca/units/logistics_mgmt/surplus_equipment/

11.7 APPENDIX 7: Secondary Quantitative Market Research

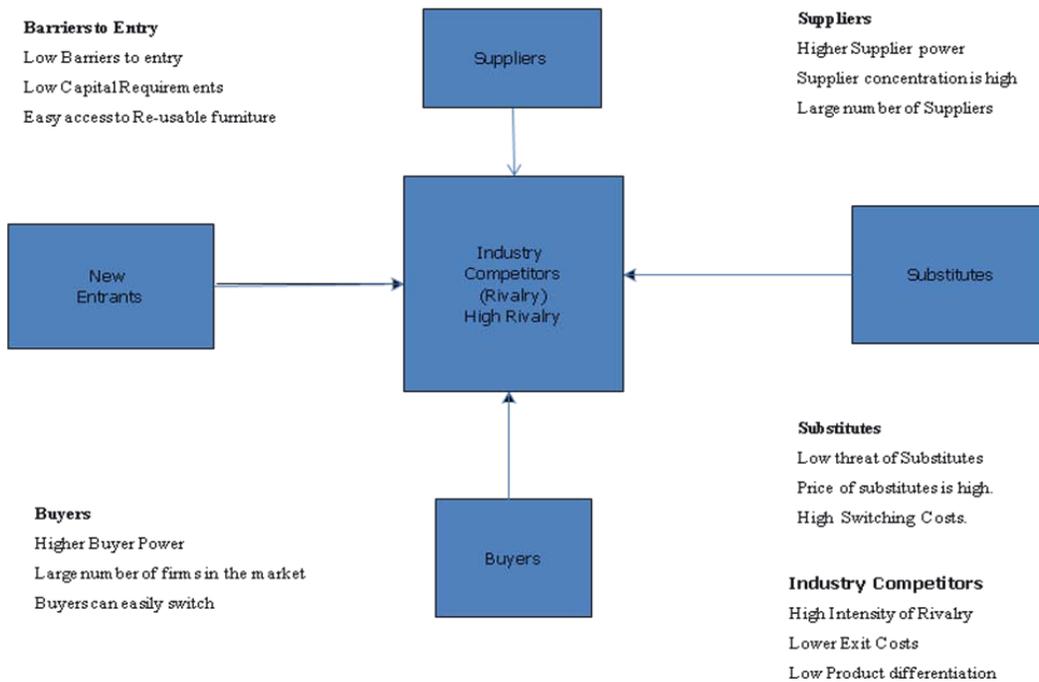
Quantitative Data on Student Population	
Category	Size
Undergraduate	
Full Time	25334
Part Time	12447
Graduate	
Full Time	7875
Part Time	957
Continuing	176
Total	46789
Number of undergraduate students admitted in 2009	7591
Number of Graduate students admitted in 2009	2988
Total New Admissions	10579
Number of International Graduate Students	865
Estimated number of Graduate students outside Vancouver	1000
Total Number of Graduate students outside Vancouver	1865
Undergraduate Students new to Vancouver every year	4,217
Grand Total new students outside Vancouver every year	6,082

11.8 APPENDIX 8: Organizational Structure



11.9 APPENDIX : Porters Analysis

The Porter's Five-Forces



11.10 APPENDIX 10: Dumping Charges For Departments

Dumping Charges Calculations			
	Metal	Wood	Misc
Approximate content in 40 Yards of dumped furniture	3	7	30
Approximate weight/Yard (lbs)	500	280	350
Approximate weight/Yard (tonnes)	0.25	0.14	0.175
Approximate Weight/40 yards (tonnes)	0.75	0.98	5.25
Dumping Charges/ton (\$)	56	15	56
Dumping Charges/40 yard (\$)	42.00	14.70	294.00
Total dumping charges/ 40 yards	351		

1lbs = 0.0005 tonnes

<http://www.recyclecddebris.com/rCDd/Handbook/Chapter06.aspx>

11.11 APPENDIX 11: Sales Mix

Sales Mix Calculations			
	Desks	Chairs	Cabinets
Quantity of items in 10 yards	9	12	6
Average Price/Unit (\$)	25	12	20
Revenue/10 yards of furniture (\$)	225	144	120
Total Revenue from sale of 10 yards of furniture	489		

11.12 APPENDIX 12: Start-Up Investment Costs

Start-Up Investment			
Website			
Concept	Quantity	Total Cost (\$)	Annual Depreciation
Website designing	1	1500	500
Total		\$1,500.00	\$500.00
Equipment Cost			
Computer	1	500	167
Camera	1	120	40
Printer	1	100	33
Total		\$720.00	\$240.00
Promotional Activities			
Small Banners	150	50	
Big Banners	30	20	
Promotional Banners	5000	300	
Glue (kg)	2	40	
Pen	5	2	
Marker	5	5	
Cell Tape	5	10	
Labels	100	20	
Lock	1	30	
Bill Book	1	5	
Total		\$482.00	
Other Current expenses			
Monthly Salary	2	989	
Maintenance	1	50	
Other	1	50	
Total		1089	
Grand Total		\$3,791.00	\$740.00

11.13 APPENDIX 13: Monthly Income Statement

Furniture Re-use Enterprise													
Income Statement Forecast (First year)													
	Month 0	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
Sales	0	1467	1467	1956	1956	1956	1956	2445	1956	1956	1956	1956	1956
Cost of Sales	0	0	0	0	0	0	0	0	0	0	0	0	0
Gross Margin	0	1467	1467	1956	1956	1956	1956	2445	1956	1956	1956	1956	1956
Direct Labour Cost	989	989	989	989	989	989	989	989	989	989	989	989	989
Total Labour cost	989												
Promotional Activities	500	100	100	50	50	50	50	300	50	50	50	50	50
Office Expenses	50	50	50	50	50	50	50	50	50	50	50	50	50
Website Hosting Charges	15	15	15	15	15	15	15	15	15	15	15	15	15
Depreciation	0	62	62	62	62	62	62	62	62	62	62	62	62
Total Administrative Expenses	565	227	227	177	177	177	177	427	177	177	177	177	177
Operating Margin	-1554	252	252	791	791	791	791	1030	791	791	791	791	791
Net Income	-1554	252	252	791	791	791	791	1030	791	791	791	791	791

* UBC is a not for profit entity and is also a registered charity and therefore exempt from income taxes under section 49 of the Income Tax Act.

Refer http://www.finance.ubc.ca/documents/financial_statements/2004-05/notes_for_statements_2005.pdf

*As per UBC's policies, Buildings will be capitalized by Financial Services only.

Refer <http://www.finance.ubc.ca/financialreporting/accountingforcapitalitems.cfm>

*As per UBC's policies, computers and related equipments are depreciated over a period of 3 years using straight line depreciation method.

11.14 APPENDIX 14: Income Statement for first 5 years

Furniture Re-use Enterprise					
Income Statement Forecasts					
	Year 1	Year 2	Year 3	Year 4	Year 5
Sales	23000	23472	23472	23472	23472
Cost of Sales	0	0	0	0	0
Gross Margin	23000	23472	23472	23472	23472
Direct Labour Cost	11868	11868	11868	11868	11868
Total Labour Cost	11868	11868	11868	11868	11868
Promotional Activities	1450	1450	1000	1000	1000
Office Expenses	650	600	600	600	600
Website Hosting Charges	195	195	195	195	195
Depreciation	740	740	740	740	740
Total Administrative Expenses	3035	2985	2535	2535	2535
Operating Margin	8097	8619	9069	9069	9069
Net Income	8097	8619	9069	9069	9069

11.15 APPENDIX 15: Statement of Cash Flow for first 5 years

Furniture Reuse Enterprise					
Statement of Cash Flows					
	Year 1	Year 2	Year 3	Year 4	Year 5
Operating Activities					
Net Profit	8080	8602	9052	9052	9052
Depreciation	740	740	740	740	740
Change in cash due to Operating Activities	8820	9342	9792	9792	9792
Investing Activities					
Website Development	-1500	0	0	-1500	0
Computer	-500	0	0	-500	0
Camera	-120	0	0	-120	0
Printer	-100	0	0	-100	0
Change in Cash due to Investing Activities	-2220	0	0	-2220	0
Financing Activities					
Funding From Sustainability Office	5000	0	0	0	0
Change in Cash due to Financing Activities	5000	0	0	0	0
Increase or Decrease in Cash	11600	9342	9792	7572	9792
Cash at the beginning of the period	0	11600	25942	40734	53306
Cash at the end of period	11600	20942	35734	48306	63098

11.16 APPENDIX 16: Generation of Value in the whole chain

Annual Value generated at each point in the Chain	
Annual Savings by Departments	
Dumping Cost	4212
New Furniture Cost	42984
Average Cost Savings by students	8424
Income generated by Furniture Dept	9069
Annual Space Savings by Landfill Dept.	480 Yards
Total Savings of \$64889 and 480*480 yards space	

Dumping Cost = Cost of dumping 40 yards of furniture every month(12*40 cubic yards)

New Furniture Cost = Difference in cost of purchasing 20 yards of furniture from outside

11.17 APPENDIX 17: Annual Savings for Students and Departments of UBC

Savings for Departments and Students (all figures in \$)			
	Desk	Chair	File Cabinet
Price Charged for All	25	12	20
Department Savings			
Price for alternative for Departments	120	50	100
Estimated Annual Quantity purchased by departments	216	288	144
Estimated Savings for Departments	20520	10944	11520
Estimated Total Savings for Departments	42984		
Students Savings			
Price of alternative for students	40	20	40
Estimated Annual Quantity purchased by students	216	288	144
Estimated Savings for Students	3240	2304	2880
Estimated Total Savings for Students	8424		
Total Estimated Savings	51408		

11.18 APPENDIX 18: Value generated over a period of 5 years

Furniture Re-use Enterprise					
Re-use value generated Forecasts					
	Year 1	Year 2	Year 3	Year 4	Year 5
Annual Savings by Departments					
Dumping Cost	4212	4212	4212	4212	4212
New Furniture Cost	42984	42984	42984	42984	42984
Average Cost Savings by students	8424	8424	8424	8424	8424
Income generated by Furniture Dept	8097	8619	9069	9069	9069
Annual Space Savings by LandFill Dept.	480 Yards				
Total \$ Value generated by furniture Re-use	\$62717 & 480 Yards space	\$64239 & 480 Yards space	\$64689 & 480 Yards space	\$64689 & 480 Yards space	\$64689 & 480 Yards space

11.19 APPENDIX 19: Contribution Analysis for sales of furniture.

Contribution Margin/Yard					
Furniture Sales Mix					
Furniture Type	Sales Price	Quantity/10 Yard	Sales/10 Yard	Variable Cost	Contribution Margin
Desk	25	9	225	0	225
Chair	12	12	144	0	144
File Cabinet	20	6	120	0	120
Contribution Margin/10 Yard					489
Contribution Margin/Yard					48.9

11.20 APPENDIX 20: Breakeven calculations

Break-Even Calculation			
Month	Initial Cost	Profit/Month	Cumulative Profit
0	3790		
1		252	252
2		252	504
3		791	1295
4		791	2086
5		791	2877
6		791	3668
7		1030	4698
8		791	5489
9		791	6280
10		791	7071
11		791	7862
12		791	8653

11.21 APPENDIX 20: Sensitivity Analysis

Sensitivity Analysis		
Number of Customers		
Goal: 50 customers per day		
% change	Yards Furniture Sale	Profit (\$)
-40%	24	-337
-30%	28	2010
-20%	32	4358
-10%	36	6705
0%	40	9052
10%	44	11399
20%	48	13746
30%	52	16094
40%	56	18441
50%	60	20788

12 REFERENCES:

1. University Leaders for a Sustainable Future
(http://www.ulsf.org/programs_talloires.html)
2. Climate action Plan, Government of British Columbia,
(<http://www.livesmartbc.ca/government/plan.html>)
3. Sustainability Office, UBC (www.sustain.ubc.ca)
4. Diversion Statistics for 2006-'07 and 2007-'08 Obtained from Sarah Orchard, Outreach Coordinator, Waste Management, Plant Operations, UBC
5. Dumping fees in Vancouver Landfill is 65\$ per MT
6. Dry wood is approximately 50% carbon by weight. For every 1 ton of carbon, there is 3.67 tons of carbon dioxide equivalent, because of the atomic weights of atoms of Carbon (6) and Oxygen (8). Hence 1 tonne of wood is equivalent to $0.5 \times 3.67 = 1.84$ tonne of CO₂ (<http://www.pprc.info/html/biorefining.htm>,)
7. Offsetting cost of 1 tonne of CO₂ is \$50
(<http://commontragedies.wordpress.com/2008/04/02/fifty-dollars-per-ton-of-carbon-dioxide/>)
8. Planning and Research Institute, UBC
(<http://pair.ubc.ca/statistics/students/students.htm>)
9. Student Services, UBC (<http://www.students.ubc.ca/facultystaff/buildings.cfm>)
10. Margin of error -10% is calculated for 95% confidence interval. Planning and Research

11.

<p>Liska Rischer, Coordinator, SEEDS Program, Sustainability Office, UBC</p>	<p>Bruce Franklin Facilities Coordinator Sauder School of Business Bruce.franklin@sauder.ubc.ca</p>
<p>Kara Bowen, Coordinator Sustainability Program Sustainability Office, UBC</p>	<p>Christian Beaudrie, OutReach Coordinator, Waste Management Department, UBC christian@recycle.ubc.ca</p>
<p>Colin Gibson, Moving Crew, Plant Operations, UBC re.use@ubc.ca</p>	<p>Gary Wolfram Operations Head, Waste Management Department, UBC</p>
<p>Dean Shourounis, Supervisor, Moving Crew, Plant Operations, UBC dean.shourounis@ubc.ca</p>	<p>Sara Orchard, OutReach Coordinator, Waste Management Department, UBC sara@recycle.ubc.ca</p>
<p>Karyn Kaplan Campus Recycling program University of Oregon knowaste@uoregon.edu</p>	<p>Lionel Johnson Furnishing Services University of Calgary ljohns@ucalgary.ca</p>

12. Administrators of Building facilities contacted for Market Research

<p>Nancy Wiggs Administrator, Law Department, UBC wiggs@law.ubc.ca.</p>	<p>Rita Zamluk. Administrator. Liu Institute for Global Issues, UBC</p>
<p>Simon Naeme Assistant Director, Irving K. Barber Learning Centre, UBC</p>	<p>Linda. K. Tommasini Associate Director, Facilities Operations and Administration Sauder School of Business, UBC Linda.tommasini@sauder.ubc.ca</p>

13. Websites of MSU Surplus store(<http://www.msusurplusstore.com/servlet/StoreFront>);

University Surplus, The University of Iowa(<http://www.uiowa.edu/~fusmm/surplus.html>);

Surplus Property, University of Missouri(<http://www.surplus.missouri.edu/>)