

Supplemental Materials: Contributions, Interview
Questions, Partnership Opportunities, and SWOT
Analysis

Sophie Loree, Xavier Morales, and Lily Wolf
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Table of Contents

Contributions	2
Supplemental Material A: Close the Loop Interview Questions	3
Supplemental Material B: Advanced Circular Polymers (ACP) Interview Questions	4
Supplemental Material C: Downer Interview Questions	5
Supplemental Material D: Integra Systems Interview Questions	6
Supplemental Material E: Enable IT Interview Questions	7
Supplemental Material F: IPS Supercart Interview Questions	8
Supplemental Material G: Reimaginarium Interview Questions	9
Supplemental Material H: Hume Landfill Services Interview Questions	10
Supplemental Material I: Hub Partnerships Opportunities	11
Supplemental Material J: SWOT Analysis	14

Contributions

Sophie Loree was the main communicator with company and business executives that were interviewed for the project, and took detailed notes during our on-site visits. She acted as an editor for the introduction, background, findings, methods, SWOT analysis, conclusion, and action plan, and was the main writer of the supplemental materials document. She ensured that each source and image was correctly documented and cited in the correct format.

Xavier Morales provided a leadership role throughout both terms of the project that helped us stay on track with deadlines and writing. He was also the main writer, organizer and editor for the introduction, background, findings, methods, SWOT analysis, conclusion, and action plan. He was a main contributor to the development and organization of the final presentation as well as several other presentations, and contributed to making flow charts regarding key aspects of our prototype model.

Lily Wolf was the main creator of graphics, diagrams, and flowcharts for our report and presentation, as well as the main designer for the report booklet. She was a main researcher during our process of gathering data, especially through online and literary resources. She was also a writer, editor, and organizer for the introduction, background, findings, methods, SWOT analysis, conclusion, and action plan. She headed the development and organization of the final presentation, as well as several other presentations.

Supplemental Material A: Close the Loop Interview Questions

1. How did Close the Loop get into the business of repurposing waste?
2. What types of waste streams do you deal with most?
3. What limitations have you experienced with certain types of plastics and which ones have worked best with your project?
4. In what ways has Close the Loop utilized items such as metals and wood?
5. What are the opportunities, growth potential, and challenges Close the Loop faced with repurposing waste?
6. Other than your partnership with Downer, do you have any other projects that could benefit from working with the Hume City Council or would benefit the Hume City Council?
7. Do you have other projects working with other councils?
 - a. Would you be willing to provide referrals?

Supplemental Material B: Advanced Circular Polymers (ACP) Interview Questions

1. How did your company get into the business of repurposing plastics?
2. Where do you get the plastic from? Is it mostly from households, industrial use, etc.?
3. How does the process work?
4. If you do find traces of metal or other material streams when sorting, what do you do with them?
5. Who do you redistribute your products to / what do they use them for?
6. What are the opportunities, growth potential, and challenges has ACP faced with repurposing plastics?
7. If you were to partner with the hub, would the plastic need to be separated already? (ie. plastic broken down from refrigerators, etc.)
8. Do you have partnerships with any other councils?
 - Referrals

Supplemental Material C: Downer Interview Questions

1. How did you get into this business?
2. Where did you learn the science behind reconaphalt?
3. What business unit within Downer primarily focuses on reconaphalt?
4. What's the current state of the reconaphalt business?
 - a. Hard numbers (economic viability and growth)
 - b. What economic/technical/feasibility challenges have you experienced?
 - c. Any issues with marketing?
 - d. How has it changed compared to articles we used for research from 2018
5. Where do you acquire most of your materials for reconaphalt?
6. About how much waste is collected compared to how much is returned to use?
7. What businesses/companies have you worked with?
 - a. Suppliers
8. What is the biggest challenge you have faced with the reconaphalt project?
9. What kinds of plastics does the reconaphalt project use?
10. Other uses for recovered materials that Downer has implemented or is considering?
11. Could you see a partnership with the hub helpful for the reconaphalt project or anything else Downer is working on?
12. Do you know any other companies that may be interested in working on this project that correlates to our work?

Supplemental Material D: Integra Systems Interview Questions

1. When was this business founded?
2. Has the company goal of circularity and waste minimization created any challenges?
 - a. What about the successes and opportunities?
3. Can you tell us more about Cradle 2 Cradle?
 - a. How does the company ensure 100% of a product can be either recycled, repurposed, or reused?
4. What do the labor requirements look like?
 - a. How much training/past experience is needed?
5. Could the DigiSMART collection help the organization of the hub (ie. help workers & residents, stay organized, collect data, etc.)?
6. Could Integra Systems help design and manufacture sorting bins for the hub through its partnership with Brink Industrial?

Supplemental Material E: Enable IT Interview Questions

1. When was this business founded?
2. How did the Renew Tech for Good Initiative get started?
 - a. What has driven the company's circularity principles?
3. We understand that the company has a goal of redistributing 1000 electronics, what challenges have occurred in working towards this goal so far?
 - a. Market-wise and material-wise?
4. What do the labor requirements look like?
 - a. How much training/past experience is needed?
5. What type of e-waste do you see most?
6. How much e-waste can generally be reused/resold?
 - a. What happens to the e-waste that cannot be saved?
 - i. What's stopping you from saving the e-waste that isn't salvageable
7. Could you benefit from a partnership with the hub?

Supplemental Material F: IPS Supercart Interview Questions

1. How was this project developed?
 - a. What challenges has the company faced when manufacturing these trolleys?
 - i. Material-wise and economic/market-wise?
 - b. What do the labor requirements look like?
 - i. How much training/past experience is needed?
 - c. Who are some of your partners?
 - d. Has the company considered expanding to other products?
2. What types of recycled plastic do the trolleys use?
 - a. Where does the company acquire the materials?
 - b. Has there been any research on using additional waste streams for the trolley?
3. Could you use recycled steel for the other parts of the trolley?

Supplemental Material G: ReImaginarium Interview Questions

1. What do you feel is the biggest challenge the ReImaginarium faces?
2. What aspects do you feel are important to consider when setting up a redistribution and recovery hub?
3. What things have you noticed that work well?
4. Besides textiles, what items are difficult to repurpose and reuse?

Supplemental Material H: Hume Landfill Services Interview Questions

1. What is the process by which the city of Hume collects hard waste?
2. How does Hume's city council differ from others in terms of handling hard waste?
3. What factors do you feel contribute most to the illegal dumping of hard waste?
4. How many customers do you get per day on average?
 - a. For drop off?
 - b. For the tip shop?
5. Which hard waste items are the most difficult to process and recycle?
6. What items do you most see commonly dropped off?

Supplemental Material I: Hub Partnerships Opportunities

Business/Company	Did We Interview Them (Y/N)	What They Do	Where They Fit Into The Model
The ReImaginarium	Y	Repair and refurbish older goods	Have a location in the mall and/or send items to them
Tufright	N	Production of plastic wood	Have a location in the mall and/or send plastics to them
IPS, Supercart	Y	Manufacture shopping carts from plastic milk cartons	Send plastics to them
Close the Loop	Y	Manufacture plastic packaging from recycled plastics and provide soft plastics, glass, and printer toner to Downer for Reconaphalt	Send soft plastics and glass parts to them
Ability Works	N	Repurpose sawdust and wood waste to produce biochar	Send sawdust and wood waste from repairing and scraping furniture to them
Brainwave Bikes	N	Collect and refurbish bicycles	Have a location in the mall and/or Send parts to them
Downer	Y	Manufacture Reconaphalt from soft plastics, printer toner, and glass	Send individual parts to them
Integra Systems	Y	Design and manufacture kiosks, standing desks, and waste bins from recycled metal	Provide kiosks and waste bins in the hub and reuse mall
Enable IT	Y	Repair and refurbish items electronics as well as taking apart irreparable electronic items and sorting the materials	Have a location in the mall and/or send parts to them
Australian Men's Shed Association	N	Retired workers that repair and manufacture goods such as furniture, bikes, and lawnmowers	Work in the repair facility
Advanced Circular	Y	Recycle plastics to be remade	Send individual plastic parts

Polymers		into new plastics	to them
BlueScope	N	Steel producer	Send steel parts to them
National Tyre Stewardship Association	N	Recycle Tyres	Send tyres to them from the repair/sorting portion of the hub
Australian Furniture Association	N	Repair and refurbish furniture	Have a location in the hub to repair and refurbish furniture brought to the hub
Sunbury Repair Cafe	N	Repair bikes and electronics	Aid with repairing electronics and bikes brought to hub
CEV Internship Program (Thermagal and CEV)	N	A program that is exploring the concept of sorting textile types using AI	Useable textiles and textile waste could be sorted at the hub via AI
Thread Together	N	Help divert clothes away from retail going to landfill to local charities	Have a location in the hub that sells clothes have been
VU Business School	N	Teach students marketing and business	Produce videos to provide education on waste management and help advertise the hub
Digiteo / ACEHub Metrics Working Group / Edge Enviro / Monash University/ Planet Price	N	Entities that work in the data collection and analysis space	Help with data tracking involving the hub as well as help develop other businesses circularity
SCRG Group	N	Rehome unwanted clothing and textiles	Collect clothing and textile waste from hub to be resold, used for rags, or converted to biofuel

Fitted for Work	N	Organization that helps get woman who are disadvantaged obtain work clothes and training	Clothing items could be circulated from the hub to their location or they could have a location in the hub that takes in work clothes brought to the hub
KANGAN TAFE	N	Provide education related to trade professions	Provide the hub with student employees/ volunteers from the TAFE
RMIT Activator	Y	Provides an entrepreneurial and innovation space for businesses, companies and start-ups associated with the circular economy.	Continue to work with the hub as it runs and hold collaboration events to help improve the hub's efficiency
Brite Industries	N	Provide training and job opportunities for individuals with disabilities	Provide the Hub with training for employees with disabilities and volunteers

Supplemental Material J: SWOT Analysis

Transportation	
Strengths	Weaknesses
<p><i>Ford Location:</i></p> <ol style="list-style-type: none"> 1. This location includes an existing factory that used to be owned by Ford, meaning that there is a lot of space already to build out from the inside and expand overtime. <p><i>Bolinda Road Location:</i></p> <ol style="list-style-type: none"> 2. The Hume City Council already owns this land. <p><i>Kangan Institute Location:</i></p> <ol style="list-style-type: none"> 3. This location is centrally located in Broadmeadows, which makes for greater resident accessibility. 4. This location could be operated directly on the Kangan Institute campus 	<ol style="list-style-type: none"> 1. The current pickup system is inconvenient due to size limitations and difficulty of scheduling.
Opportunities	Threats
<ol style="list-style-type: none"> 1. Local businesses all outsource transportation separately, meaning that there are a variety of trucks moving items in and out of Hume already, many of which are relatively empty. These could be utilized to transport items for multiple companies, i.e. their current business and the hub. 	

Customers	
Strengths	Weaknesses
<ol style="list-style-type: none"> 1. The tip shop currently experiences significant traffic, and many customers stop by multiple times a day to buy goods that they refurbish and resell for profit themselves. This shows the existing market for second-hand items at low prices. The reuse mall would build upon this interest and significantly expand the current operations. 2. A wide variety of items exist in the waste stream, and many are in good enough condition to either be repaired or sold as-is. No two items would be the exact same. 	<ol style="list-style-type: none"> 1. No surveys or interviews have been conducted to gauge community interest in the hub model. 2. The migrant population may be culturally predisposed to dumping. 3. There is a lack of awareness of hard waste disposal methods among community members.
Opportunities	Threats
<ol style="list-style-type: none"> 1. The low income population in Hume provides a potential market for used goods. 	<ol style="list-style-type: none"> 1. The hub does not have an established reputation in the resale space as compared to bigger competitors, such as Savers. It will take time for residents to trust and use this hub regularly. 2. The stigma around reused, repaired, and repurposed goods have the potential to cause residents to be wary of second-hand shops within the hub. 3. Widespread customer behavior change takes time. 4. A lot of illegal dumping is commercial, based on info from Kirsty Laino from the Campbellfield and Sunbury resource recovery hub tours. Companies that don't want to pay large fees to dispose of waste simply leave everything in big open spaces whenever there's nobody around.

Employment

<p>Strengths</p>	<p>Weaknesses</p>
<ol style="list-style-type: none"> 1. The hub creates employment opportunities for people with a variety of skills. 2. Working at the hub would foster development of valuable skills in various areas, such as trade, marketing, sales, etc. Through the hub employment, unskilled workers would receive training and gain experience that they could then take to find other employment opportunities. In this way, the hub would act as a factory that develops employable individuals. 	<ol style="list-style-type: none"> 1. The presence of the hub could undermine the operations of local businesses by taking from their employment pool and providing the same functionality. 2. Employing disadvantaged individuals requires significant training and supervision.
<p>Opportunities</p>	<p>Threats</p>
<ol style="list-style-type: none"> 1. Employing disadvantaged individuals such as people with disabilities would give the hub access to outside social enterprise funding. 2. Based on Hume population data, there is an expected increase of Hume residents by about 137,000 people. This could increase the potential workforce of the hub, specifically in terms of unskilled migrant employees. 3. Training could be beneficial for under-employed/disadvantaged individuals when searching for further employment after some time at the hub. 4. The presence of the TAFE would provide an employee base for both the collection and redistribution hub and the reuse mall. 5. Partnership with The Men’s Shed Association. 	<ol style="list-style-type: none"> 1. In general, it can be difficult to find workers willing to fill non-desirable employment roles such as sorting hard waste. 2. It may be difficult to find volunteers to take on supervisor roles for disadvantaged employees. 3. Shortage of skilled workers in repair trades.

Locations	
Strengths	Weaknesses
<p><i>Ford Location:</i></p> <ol style="list-style-type: none"> 1. Includes an existing factory that used to be owned by Ford, meaning that there is a lot of space already to build out from the inside and expand overtime. 2. The proposed location for the hub is next to Hume Highway, making for easy access for people coming from further areas of Hume or different suburbs altogether. <p><i>Boldina Road Location:</i></p> <ol style="list-style-type: none"> 2. The Hume City Council already owns this land. <p><i>Kangan Institute Location:</i></p> <ol style="list-style-type: none"> 3. Centrally located in Broadmeadows for resident accessibility. 4. Operate on the Kangan Institute campus. 	<p><i>Ford Location:</i></p> <ol style="list-style-type: none"> 1. The proposed hub location is not accessible via public transport.
Opportunities	Threats
<p><i>Ford Location:</i></p> <ol style="list-style-type: none"> 1. The potential hub location is surrounded by many existing industries in Hume. This gives the opportunity for partnerships with the hub, especially because a handful of businesses focus on recycled goods (i.e. IPS, ACP, etc.). 2. New industries and businesses are coming to Hume's industry sector that have the potential to work with the hub. <p><i>Bolinda Road Location:</i></p> <ol style="list-style-type: none"> 1. New development (apartments, offices, etc.) near the current resource recovery hub is already in initial stages. 2. The potential hub location is surrounded by many existing industries in Hume. This gives the opportunity for partnerships with the hub, especially because a handful of businesses focus on recycled goods (i.e. IPS, ACP, etc.) <p><i>Kangan Institute Location:</i></p> <ol style="list-style-type: none"> 1. TAFE school being directly associated with the hub could foster various partnership options between the two. Younger students could work at the hub to gain practical experience, or older students could gain experience in a more supervisory role if they already have skills in a relevant trade. 2. The potential hub location is surrounded by many existing industries in Hume. This gives the opportunity for partnerships with the hub, especially because a handful of businesses focus on recycled goods (i.e. IPS, ACP, etc.). 	<p><i>Ford Location:</i></p> <ol style="list-style-type: none"> 1. A Salvation Army (Salvo's) warehouse is just a four-minute drive from the proposed location of the hub and may cause competition with the hub. <p><i>Bolinda Road Location:</i></p> <ol style="list-style-type: none"> 1. This location may pose a source of skepticism, given its history as a drop off center. <p><i>Kangan Institute Location:</i></p> <ol style="list-style-type: none"> 1. Located right next to the Broadmeadows shopping center.

Operations	
Strengths	Weaknesses
<ol style="list-style-type: none"> 1. The two current tip shops located in the Resource Recovery Centers sell items in the condition they are given. The hub would focus on selling newly repaired, refurbished, and cleaned products, putting the items back in nearly perfect condition. 2. Digital operations are more efficient. 	<ol style="list-style-type: none"> 1. The stores within the mall are dependent on the number of drop-offs from residents. 2. The Hume City Council has a limited budget available.
Opportunities	Threats
<ol style="list-style-type: none"> 1. Research-based partnerships with universities would foster innovations that could then be used to improve operations throughout the hub. 2. International hub models, especially the ReTuna reuse mall, serve as insight into the potential success of Hume’s own hub. 	<ol style="list-style-type: none"> 1. Digitalization is expensive and requires a lot of expertise. 2. Landfill fees are increasing, which would increase the cost of handling any non-recyclable material.