

# GNG2101 Project Deliverable G: Business Model and Economics Report

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## **Abstract**

This report covers the business expenses and economic plan for the seatbelt aid company *Belt Buddies*. The model shown below will be the manufacturing model, which combines the materials and components to sell the item to customers. The report will cover a business report as well as an economic report. The expenses included are rent, salaries, marketing, material costs, equipment, program subscription, utilities and overhead. Each expense is classified as either variable, fixed, direct or indirect. The economic report will also provide income statements, NPV analysis and justification for assumptions. Any references that were used will be included at the end of the report.

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## **1. Introduction**

The seat belt guide concept is not only a beneficial aid to those with physical disabilities similar to that of the original client's, it also has applications within the markets of the elderly and children. Developing and selling this concept would prove a very commercially viable product, as it would be purchased by the three large consumer groups (children, elderly, those with mobility issues/disabilities) that would purchase the product as a necessity to help them with the everyday task of securing themselves in a standard 3-point car seat belt. The following sections will present the hypothetical company's potential business model, a list of expenses based on the manufacturing process, an income statement to determine the fiscal viability, and finally a Net Present Value (NPV) analysis will be performed to determine the breakeven point of the company. The document's business report, economics report, and stated assumptions serves as the basis for turning the seat belt guide idea into a functional start-up company.

## **2. Business Model**

The business model that would best suit the car seat belt guide production company would be the "manufacture model". The specific business model is optimal as it uses raw materials and components to produce and distribute final products right to the customers. The product is designed on computer assisted design (CAD) software as a 3D object, before being printed with PLA filament on a 3D printer. The raw PLA filament is constructed and printed into the seat belt guide, which then can be directly sold to the consumers, the exact business model of the "manufacturer model". Additionally, this product being sold would not fit the other business models such as the refilling, maintenance, subscription, and etc.; as the seat belt guide is two physical hardware components designed to last at least 10 years, assisting those in buckling

themselves in car seats. The following figure is the Triple Bottom Line Business Model of the seat belt guide company.

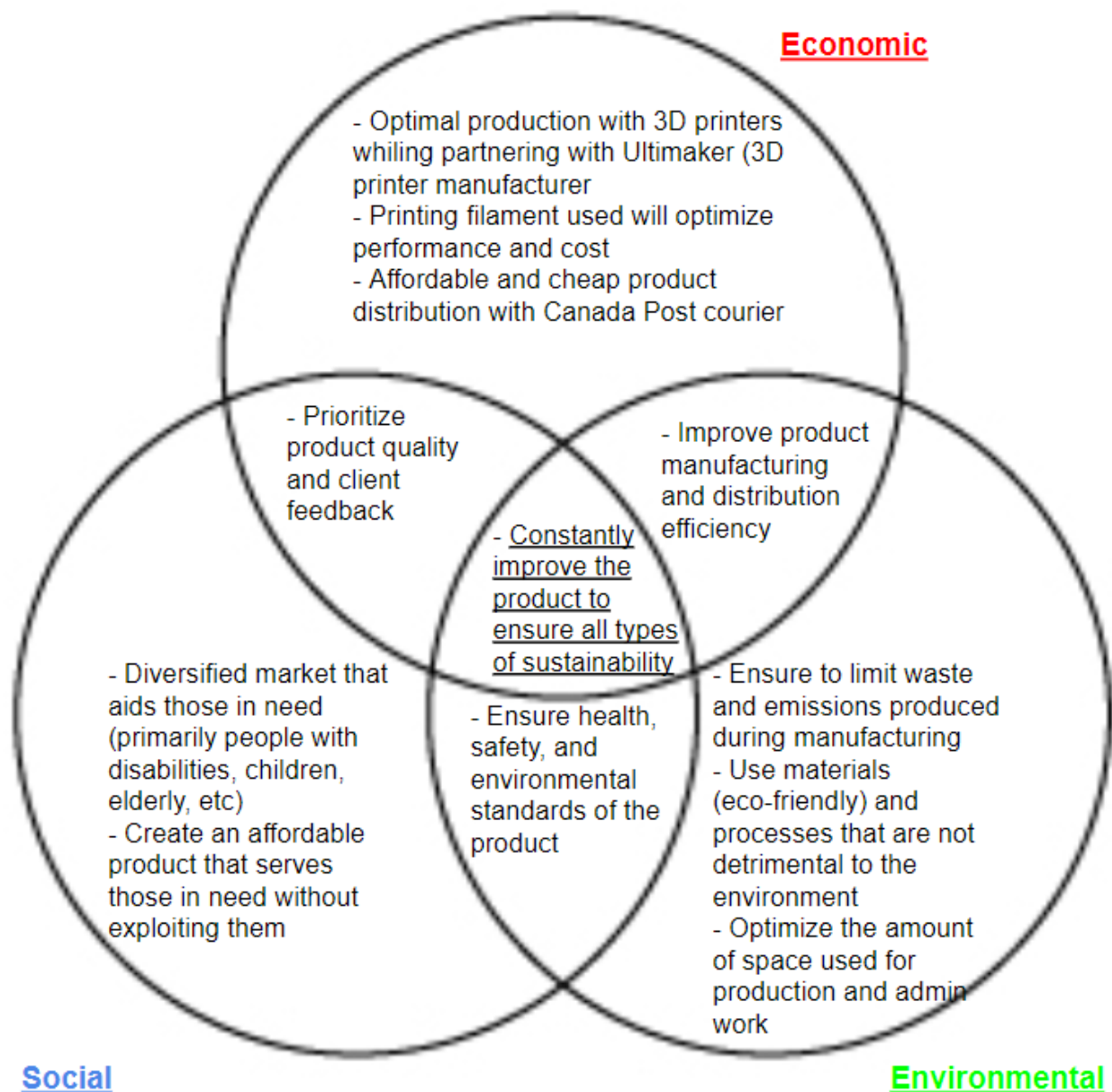


Figure 1: Triple Bottom Line Business Model

This following section will outline the assumptions made for the triple bottom line business model, and the business and economic reports of the deliverable. The first assumption is the consumer demographic being that of people with physical disabilities similar to that of arthrofibrosis (and any other mobility related ones), young children, and elderly people that has difficulty securing themselves in car seat belts. The next assumption is that the company will focus on the production and selling of the product, no refilling, repairing, maintenance, or subscription services will be provided. The company will not have strong customer relations as its primary goal is to produce the seat belt guide, only taking customer feedback to potentially improve the product. The company will depend on its shipment courier for the distribution of the product. Finally, the only source of income of the company will be from the sales of the seat belt guide products. The primary stakeholders/partners of the business are the courier, the 3D printer manufacturers, and the printing filament providers, as they are all necessary to the production of the product. All these assumptions outlines the company's manufacturer business model of focusing on the production of the selt belt guide.

### **3. Economics Report**

#### **3.1 Expenses**

Each expense is classified as either variable, fixed, direct or indirect cost based on the manufacturing and sales of the team's product. The cost estimations are based on research for similar companies such as Veigel and Seat Belt Extender Pros.

Table 1: Expense Classifications

<b>Expenses</b>	<b>Classifications</b>	<b>Research</b>	<b>Cost/Year</b>
<b>Labour</b>	Fixed/Indirect	Average salary/year of 6 employees	\$294,500



		=\$45,000  Vacation, Holiday, and Sick Leave =8,000  Health Insurance =\$7,000  Pension Costs =\$9,500	
<b>Material</b>	Variable/Direct	3D printer ink per one roll that produces 27 products =\$40/unit  Grab Handles =\$3/unit	\$4.48/unit
<b>Equipment</b>	Fixed/Direct	Five Ultimaker 2 and Connect 3D printer =\$3,531	\$17,655
<b>Packing and Shipping</b>	Variable/Direct	Cost per unit =\$5	\$5/unit
<b>Overhead</b>			
<b>Rent</b>	Fixed/Indirect	Yearly rent of 4030 sf warehouse = \$26.56 sf/year	\$107,025
<b>Utilities</b>	Variable/Indirect	Electricity = \$2,300/month  Water Consumption =\$61/month	\$28,332
<b>Office Supplies</b>	Variable/Indirect	Average cost of office supplies =\$4,300	\$4,300
<b>Program Subscription</b>	Fixed/Indirect	Yearly Subscription of CAD =\$1,775	\$1,775
<b>Marketing</b>	Fixed/Indirect	Fixed yearly budget =\$50,000	\$50,000
<b>Accounting and Legal Expenses</b>	Semi-variable/Indirect	Average cost =\$7,500	\$7,500

### **3.2 Income Statement**

An income statement can be generated for the company for its 3 years of operation, showing the gross profit on sales, total operating expenses (based on the expenses of Section 3.1 of this report) , operating income and net income.

Table 2: Income Statement

Sales (\$60 CAD/unit *40000 units)		\$2400000
Less Cost of goods sold:		
Shipping and packaging (\$5/unit)	\$200000	
Ink(\$1.28/unit)	\$51200	
Handle(\$3/unit)	\$120000	
Gross profit on sales		\$2028800

Non operating expenses	Price per year/\$(CAD)	Total price for 3 years/S(CAD)
Electricity and water	28332	84996
Marketing campaigns	50000	150000
Salaries	294500	883500
Rent	107025	321075
Depreciation of Equipment	1765.5	5296.5
Accounting and legal expenses	7500	22500
Office Supplies	4300	12900
Equipment	One type purchase	17655
Program subscription	1775	5325

Operating income before taxes (Gross profit on sales less Non operating expenses)	\$525553
Less Income Tax (15%*525553)	\$78833
Net Income	\$446720

### **3.3 NPV Analysis**

NPV analysis will be done to compare the income and expense over a period of 3 years and using a monthly compounding interest rate.

#### **Assumptions:**

- Monthly Expenses are rent, utilities and labour which total to \$25 000
- To purchase equipment, it will cost \$17,655
- \$50 000 will be spent on marketing each year
- Each following year, \$2,000 is spent on repairs and upgrades to equipment
- Material cost is dependent on the number of units sold and are bought at the start of the year
- Interest rate is 1% compounded monthly
- Calculated monthly over a 3-year period
- N is units sold per month
- Only Income comes from sales
- Based on benchmarking unit price should be \$43

**Expense NPV: Replace 51000 by 25000** Total Expense NPV =  $900\,000 + 12 * N * 21$

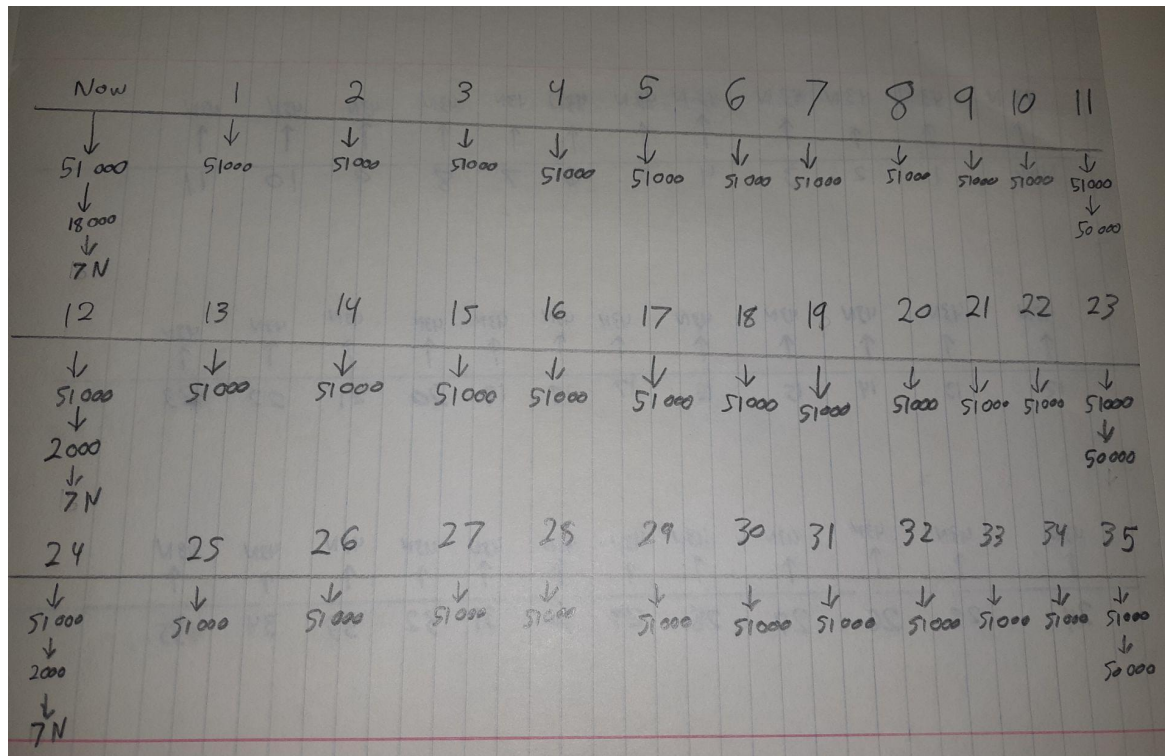


Figure 2. NPV Analysis Part 1

**Income NPV: Replace 43N by 60N** Total Income NPV=  $N \times 2160$

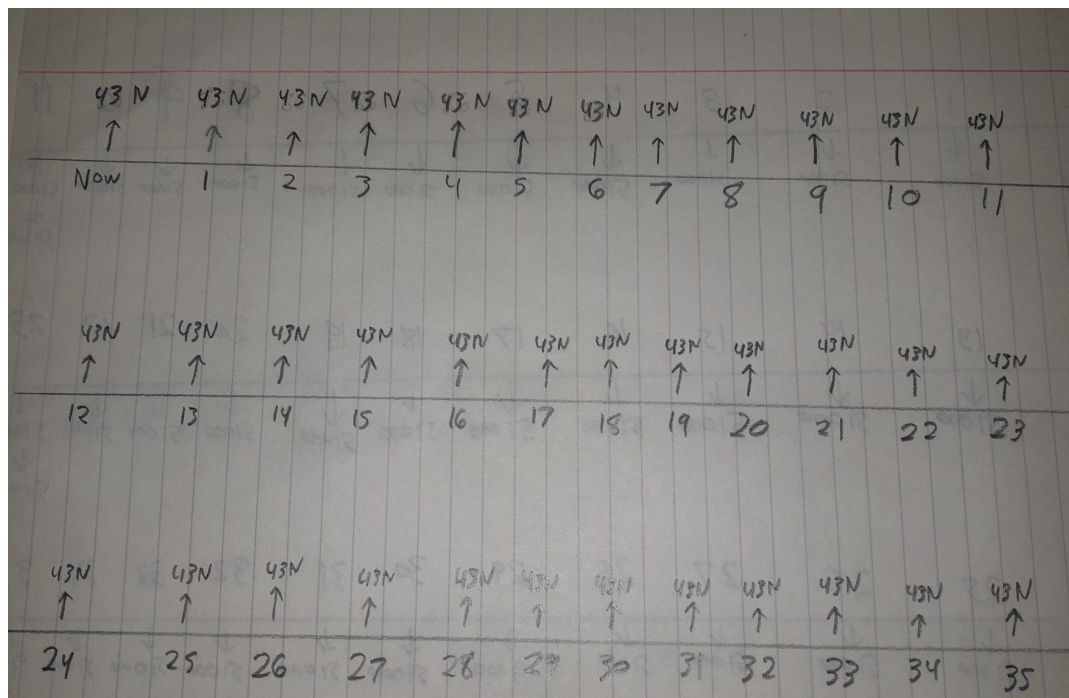


Figure 3. NPV Analysis Part 2

Break Even:

To determine how many units the company needs to sell the expenses need to be compared to the income and find the difference. Both the income and expenses are parameterized for the number of units sold and the function will be solved for N which is the number of units sold per month.

Total Expense NPV = Total Income NPV

$$900,000 + 12 * N * 21 = N * 2160$$

$$900,000 = 1908N$$

$$N = 472$$

To break even 472 units, need to be sold each month, which is 5664 units a year.

### **3.4 Assumption Justification**

According to CommercialCafe (2020), the average office rent per square foot in Ontario in 2020 is \$26.56. Therefore, to rent a facility that is approximately 4000 square feet, the total rent would cost \$107,025 per year.

For utilities, electrical energy cost per square foot for commercial buildings in Ontario is \$1.42, which makes up \$2,300 of electrical bill per month.

Another assumption the team has made is a production worker's salary in Ontario. The average salary of production workers is \$32,367 per year. Since there are various positions in the company, the average salary of the employees would be approximately \$45,000.

Hiring accountants and lawyers is essential for organizing the company's financial statements and reports. The accounting and legal service would cost \$176 per hour (Matich,

2018). The yearly service fee will be \$7,500 but since this is a semi-variable cost, it could cost more from time to time.

The depreciation rate of equipment is assumed to be 10% per year because the life expectancy of the printer is assumed to be 10 years. Income tax is taken as 15% (Government of Canada, 2022).

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## Wrike Updates

<https://www.wrike.com/frontend/ganttchart/index.html?snapshotId=TL3O4y6N3MleJPeV58i3ooldXxnV0XGy%7CIE2DSNZVHA2DELSTGIYA>

