**Section 2**

**Team 8**

**Fall 2023**

**Business Plan**

**AirArmor**

An Inflatable helmet made with Kevlar and Butyl Rubber to appeal to urban bicyclists.

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**Executive Summary**

AirArmor

Olivia Smith

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**Phone:** (757)-679-1594

**E-mail:** smithor@dukes.jmu.edu

**Management:**

Titles:

Chief Executive Officer

Vice President(s)

Operations Manager

Media Manager

**Industry:** Sporting and athletic good manufacturing

**Number of Employees:** 10

**Amount of Financing Sought:** $100,000 bank loan at 8.5% interest for 5 years. $200,000 of convertible notes with 6% interest from investors.

**Investment Sources:** $100,000 from owners. Convertible debt from angel investor(s).

**Use of Funds:** Purchase of machinery and raw materials.

**Product/service selling price**: $104

**Business Description:** Small manufacturing LLC that produces inflatable helmets to ensure the safety of our consumers.

**Products/Services:** Our product is an inflatable helmet designed to be safe and convenient to store for urban cyclist commuters. All six of our materials are from U.S. manufacturers and our product is made in the U.S.. The cost to make our inflatable helmet is $25.95.

**Competitive Advantage:** Our compact design for our product is hard to imitate for potential customers. Our product is higher quality than other helmets in the bicycle market.

**Markets:** Our target market is millennial U.S. bikers. Some segments that may exist within this target market are: urban and suburban bikers, recreational and transportation use, and varying income levels. The potential market size of this se

gment is 46.37 million with a growth rate of -0.022% in total over the next 5 years

**Distribution Channels:** We are using a business to consumer model with most sales expected to be through our website. We plan on selling to Amazon and Dick’s starting in year 2. Online orders will be shipped via UPS and retail orders will be shipped via Old Dominion Freight Line.

**Competition:** Our competition base is composed of sellers of standardized bike helmets. The bike helmet industry is composed of big chain sports retailers. Within those, exclusive helmet retailers exist. Looking into the future, we expect to see helmet retailers on this rise due to the increase of the population of our target market.

**Financial Projections (Unaudited):**

 2023 2024 2025 2026 2027

Revenue: 1944.8 2662.4 3868.8 5896.8 9583.6 (dollars in thousands)

EBIT: (1.78) 142.76 100.13 719.12. 1950.88

1. **Elevator pitch**

800 people on average die from cycling accidents each year, but only 18% of people wear a bike helmet. Why is that? Too clunky to lug around? Or not “cool” enough to wear in public? We are a manufacturing startup based out of Charlotte, North Carolina, and we have a solution. Our product, AirArmor, is an inflatable helmet that can easily fit in your bag. Made of puncture-proof Kevlar and Butyl Rubber, we can ensure our customers will know their heads are protected. And with our target market always being on the go, we know our easy-to-transport product is exactly what they need. Safety is our top priority, but we don’t skip out on convenience or aesthetics to ensure our product is desirable on the market. We’re seeking $200,000 of convertible debt at 6% interest to turn this idea into reality.

1. **Product/Service**

Our product is inflatable and deflatable so the customer can store their helmet easily in their bag. Made from Kevlar and Butyl Rubber, our customer can take it on the go without the inconvenience of a typical helmet’s size and weight. Due to the inflatability our helmet is one size fits all and fits snug on your head due to a Velcro strap. Our helmet is one-size fits all due to our unique Velcro strap.

1. **Competitive Advantage**

Our offer to the marketplace is advantageous because we have first movers advantage, because our helmet can be folded and fit into small places where existing helmets cannot. We have the infrastructure to create this type of helmet with high quality materials and a uniquely innovative and efficient process compared to our current competitors.

1. **Value Proposition**

Due to our unique product and top-of-the-line manufacturing process, there is an opportunity to be bought out by competitors or seize significant market share. We are set to be profitable by year 2 and increase our growth profit through year 5.

1. **Business Strategy**

AirArmor’s business strategy of differentiation will enable us to carve out a large niche in the industry. Our high quality will enable us to command a higher price and thus a greater profit margin, as well as garner a strong reputation. To achieve this from an operational standpoint, we run multiple quality assurance tests throughout the process. Simultaneously, we will offer various benefits and utilize other strategies that will reduce turnover to have more experienced and reliable employees in the long term as our Human Resource strategy, which will help us maintain our quality standards.

1. **Business Location**

Charlotte, North Carolina is a thriving city with a large population, strong labor market and healthy manufacturing sector (*Manufacturing in the Charlotte Region* 2021). The city is simultaneously in a state with very low union membership, making it advantageous for startups in manufacturing (*Union members - 2022 - U.S. Bureau of Labor Statistics* 2022). North Carolina also has the lowest statutory corporate tax rate in the US, making it a great place to plant our roots (Fritts, *State corporate income tax rates and brackets* 2023). The warm climate of the region will prevent supply chain interference during winter due to cold conditions. We are also positioned comfortably on the east coast with fast access to crucial highways for distribution of goods and arrival of supplies.

1. **Outsourced**

The manufacturing of the air pump that comes with the helmet was outsourced due to it being cheaper by approximately $0.70 per unit. For management, Information Technology & Accounting are both outsourced due to the small scope of the firm, and therein the lack of necessary resources to perform these functions efficiently when compared to outsourcing these functions to larger companies (E.g., Deloitte for Accounting and Tax). Cleaning is outsourced due to the efficiency benefit of a separated cleaning schedule and similar resource discrepancies. These outsourcing decisions are made with the intention of increasing efficiency of in-house functions and maintaining a high degree of quality elsewhere.

1. **Financial Performance**

AirArmor is in a strong position in our first year of business, making $1,994,800 in sales revenue. Though we experience a net loss of ($15,578) in year one, we jump to a positive net income of $130,762 in year two. In years four and five our revenue rapidly increases, with net income totaling $712,689 and $1,947,551, respectively. Our total assets remain steady for the first three years of business, then climb to $1,451,070 in the fourth year, and $3,407,460 in our fifth year. Total liabilities remain manageable, never exceeding $441,223. Paying our debt will never be an issue with a times interest earned ratio above the industry average.

**Exhibit 1: Organizational Chart**



NOTE: Chart is not indicative of all employment positions intended to be filled in later years.

**Exhibit 2: Wages, Deductions, Benefits, Incentives**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **JOB TITLE** | **Yearly Base Pay** | **Base Hourly Wage** | **State Income Tax (5.25%)** | **FICA/State Insurance (7.25%)** | **Fed. Income Tax** **(10-37%)** | **Raise/Year Possible (3% Base)** | **Severance Pay** **(3 mo.)** | **Take Home Pay** |
| General manager | $130,000.00 | X | $6,825.00 | $9,945.00 | $31,200.00 | $3,900.00 | $32,500.00 | **$82,030.00** |
| Operations Manager | $104,000.00 | $50.00 | $5,460.00 | $7,956.00 | $24,960.00 | $3,120.00 | $26,000.00 | **$65,624.00** |
| Marketing Manager | $100,880.00 | X | $5,296.20 | $7,717.32 | $24,211.20 | $3,026.40 | $25,220.00 | **$63,655.28** |
| Financial Associate | $80,080.00 | X | $4,204.20 | $6,126.12 | $19,219.20 | $2,402.40 | $20,020.00 | **$50,530.48** |
| Media Controller | $71,760.00 | X  | $3,767.40 | $5,489.64 | $15,787.20 | $2,152.80 | $17,940.00 | **$46,715.76** |
| Design Associate | $66,560.00 | X | $3,494.40 | $5,091.84 | $14,643.20 | $1,996.80 | $16,640.00 | **$43,330.56** |
| Customer Support | $62,400.00 | $30.00 | $3,276.00 | $4,773.60 | $13,728.00 | $1,872.00 | $15,600.00 | **$40,622.40** |
| Salespeople\* | $54,080.00 | X  | $2,839.20 | $4,137.12 | $11,897.60 | $1,622.40 | $13,520.00 | **$35,206.08** |
| Distributions | $52,000.00 | $25.00 | $2,730.00 | $3,978.00 | $11,440.00 | $1,560.00 | $13,000.00 | **$33,852.00** |
| Manufacturing | $44,550.00 | $22.50 | $2,338.88 | $3,408.08 | $5,346.00 | $1,336.50 | $11,137.50 | **$33,457.05** |

\*Additional pay earned on commission, up to $80,000.00

**Skills, Knowledge, Abilities:**

|  |  |
| --- | --- |
| General Manager | Prior related-industry experience in upper-managerial role with strong results, educated |
| Other Managers | Prior related-industry experience in managerial role with specialized education |
| Financial Associate | Financial background (Education and/or experience), related-industry familiarity |
| Design Associate | Background education, design portfolio with strong results indicating experience |
| Salespeople | Marketer experience, related-industry familiarity, strong people skills/networking skills |
| Media Controller | Digital advertising & online presence expertise, related-industry familiarity |
| Customer Support | Communications/support experience, people skills, patient demeanor pref. |
| Distributions | Skills in inventory scanning & packing arrangement, organized and physically capable |
| Manufacturing | Physically capable with some craftmanship skills, dedication to quality of work |

|  |
| --- |
| **Benefits** |
| Basic Healthcare Plan for all employees ($350/month per employee)Minimum 2 weeks per year Paid Vacation, up to 4 weeks possible (Incentive)Retirement Contribution (Match employee contributions up to $1,250/year per employee)Severance Pay **(\*Severance Pay = 3 months of full-time wage)** |
| **Motivation/Incentives****Performance**: Increased Vacation Time; Variable Bonuses (Manager’s discretion, surplus)**Performance:** Pay Raises (Yearly, **up to** 3% of Annual Base Wage based on performance)**Loyalty**: Inflation Protected Wages (Scaled to reported inflation for prior fiscal year) |

**NOTE**1: IT, Accounting, & Cleaning are all outsourced in this model.

**NOTE**2: Employment totals for Years 1 through 5 are **11**, **16**, **21**, **27**, and **34** respectively.

**Exhibit 3: Marketing Segmentation Analysis / Target Market Selection**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Target Name** | **Size (# of People or Households in Segment)** | **Growth Projection** | **Description** | **Priority level for targeting** | **Justification for Targeting** |
| **Millennial U.S. Bikers** | 46.37 million (Statista Market Insights, 2023). | Over the next 5 years total -0.022% (Statista Market Insights, 2023). | Ages 25-34, Income between $60-100k annually, primarily males, middle class, people who live in urban areas, areas with a stable climate, outgoing bikers with the desire to "look cool", people with moderate discretionary income. | 1 | One of the main reasons that people don't wear helmets is because they are viewed as "uncool". Our goal is to reverse that stereotype. We want to target a younger audience that bike recreationally and for transport, which adults do more than youth. (Statista Research Department 2023). |

**Exhibit 4: Market Quantification**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Year** | **Tot Mkt Potential** **(# Customers)\*** | **Mkt Growth Projection\*\*** | **Market Share\*\*\*** | **Product**  | **Annual Unit Sales** | **Unit Price or Weighted ASP** | **Annual $ Revenue** |
| Year 1 | 14.96 million | 5.30% | 0.50% | Inflatable Helmet | 18,700 | $104.00 | $1,944,800 |
| Year 2 | 15.75 million | 5.00% | 0.65% | Inflatable Helmet | 25,600 | $104.00 | $2,662,400 |
| Year3 | 16.53 million | 5.60% | 0.90% | Inflatable Helmet | 37,200 | $104.00 | $3,868,800 |
| Year 4 | 17.46 million | 5.35% | 1.30% | Inflatable Helmet | 56,700 | $104.00 | $5,896,800 |
| Year 5 | 18.40 million | 5.50% | 2.00% | Inflatable Helmet | 92,150 | $104.00 | $9,583,600 |
| We determined our total market potential by multiplying the global helmet market size (Astute Analytica, 2023) by the compounding annual growth rate (Nandi, 2021). We then multiplied that number by the percentage of helmet sales in North America (Nandi, 2021). |
| We determined our growth projections using the compound annual growth rate from the last answer.  |
| To determine our market share by looking at the market share of the most competitive helmet in the bike helmet industry (Helmets.org, 2023) and divided them by the market shares of the *other* companies listed in the source. Because our product is going into such a competitive industry and with the implications of a safety bike helmet, we came out to the number of 2% by year 5 and worked backwards.  |
| We determined our annual unit sales amount by multiplying total market potential of customers x annual purchase amount x market share. Annual purchase amount is determined by how often our consumers buy a helmet, which is once every three years.  |
| **Forecast by month** | **Units** | **Revenue ($)** |
| May '24 | 100 | $10,400 |
| Jun | 150 | $15,600 |
| Jul | 400 | $41,600 |
| Aug | 750 | $78,000 |
| Sep | 1300 | $135,200 |
| Oct | 1400 | $145,600 |
| Nov | 1600 | $166,400 |
| Dec | 1900 | $197,600 |
| Jan '25 | 2000 | $208,000 |
| Feb | 2500 | $260,000 |
| Mar | 3200 | $332,800 |
| Apr | 3400 | $353,600 |



**Exhibit 5: Positioning / Competitive Analysis**



**Exhibit 6: Marketing Mix**

|  |
| --- |
| **Product/Service Branding** |
| Our brand promise is 'Providing safety and style across America'. Our brand name is AirArmor. Our logo can be viewed here: [Logo](https://www.canva.com/design/DAFwUkSQJpA/1kXP5MDgZLbjSAVyBxWHgw/edit). Our slogan is 'Inspire your inner rider'. The branding strategy we are using is line extension, planning to expand into the snow sports and motorcross market after year 5. The helmet industry is currently in the maturity stage. |
| **Pricing** |  |  |  |  |  |  |
|  | **2024** | **2025** | **2026** | **2027** | **2028** |   |
| **Unit Variable Cost:** | $25.95 | $25.95  | $25.95  | $25.95  | $25.95  |   |
| **Wholesale Price:** | X | $52  | $52  | $52  | $52  |   |
| **Retail Price:** | $104  | $104  | $104  | $104  | $104  |   |
| Our competition floor consists of the cost of making our product, 25.95 and our competition ceiling with the most expensive helmet in our market at around $200. Our product is priced at $104 to compete with the top bike helmets in the industry along with other inflatable helmets. Wholesale price should be double your cost of goods sold which is $25.95 x 2 = $52 (Canlas, J, 2023). Following, Cost of goods sold should be 25% of your retail price, giving you 25.95 x 4 = $104.00 (QuickBooks, 2017)  |
| **Distribution/Location Strategy** |  |  |  |  |  |
| We do not have a physical store to sell our product, but we are looking to use direct distribution in our first year, distributing exclusively on our website Year 1, then begin using a mix of direct and selective distribution to wholesale it to Amazon and Dick's Sporting Goods in year 2 and then on. We will distribute our product from our website to customers using UPS, from our warehouse in Charlotte NC. We will be using Old Dominion Freight Line to distribute our wholesale sales to Amazon warehouses and Dick's Sporting Goods stores. |
| **Promotional Strategy** | **(in thousands of $ - verify $ are correct)** |  |
|  | **2024** | **2025** | **2026** | **2027** | **2028** |   |
| Total IMC Budget: |  $ 194.50  |  $ 266.20  |  $ 386.90  |  $ 590.00  |  $ 958.40  |   |
| Advertising Exp: |  $ 97.25  |  $ 133.10  |  $ 193.45  |  $ 295.00  |  $ 479.20  |   |
| Sales Promo Exp: |  $ 58.35  |  $ 79.86  |  $ 116.07  |  $ 177.00  |  $ 287.52  |   |
| PR Exp: |  $ 29.18  |  $ 39.93  |  $ 58.04  |  $ 88.50  |  $ 143.76  |   |
| Other Promo Exp: |  $ 9.73  |  $ 13.31  |  $ 19.35  |  $ 29.50  |  $ 47.92  |   |
| We decided that we would put 10% of our sales revenue each year into our Total IMC Budget. Within that budget, we want to spend 50% on advertising and 30% on sales promotion to try to get our name out there. Then 15% on PR to ensure our company is in public good standing, and the remaining 5% to other promotional expenses such as 4 Sporting good trade shows each year. Because helmets aren't purchased very frequently (on average every 4 years). We are relying on word-of-mouth marketing and sales promotion events. |
| # of Salespeople: | 2 | 2 | 3 | 4 | 5 |   |
| Compensation Method: | $54,080 fixed salary with 20% commissions, maximum total earnings $80,000 |
| In year 1, we are going to only have one salesperson, and add more as demand increases. Since we are a startup, we don’t have the demand nor finances to allow for anymore salespeople. We are going to pay them $54,080 as a fixed salary with 20% commissions, with maximum total earnings capped at $80,000. We want to give our salespeople a fair base salary and a commissions percentage that will incentivize them to put in their best effort into selling our product. |

**Exhibit 7: Flow Chart**



Source for time estimates: (Morris, 2020)

For each major quality step:

|  |  |  |  |
| --- | --- | --- | --- |
| **Quality Step** | **What is measured?** | **How often?** | **How will you ensure quality?** |
| Q1 | Quality of supplies | Per delivery | Sample test two from each delivery. Insure correct dimensions of all materials, no fraying of Kevlar, and no holes in Butyl Rubber sheets.  |
| Q2 | Ability to hold air | One each day | Inflate to 8 PSI. Pass if PSI is above 7.97 PSI by next day. |
| Q3 | Durability | One each day | Drop from 2 meters with enough weight in helmet to reach 14 mph upon impact of flat anvil (Bicycle Helmet Safety Institute, 2022). |

For each critical resource:

|  |  |  |  |
| --- | --- | --- | --- |
| **Critical Resource** | **Brief Description** | **Unit Cost (in appropriate unit)** | **How many?** |
| CR1 | Hydraulic Press | $74,000 | 1 |
| CR2 | Vulcanizer | $15,000 | 1 |
| CR3 | Professional stitcher | $22.50 per hour | 2 |

Briefly describe your main facility - provide information about layout and dimensions.

It is a 10,905 square foot warehouse located in Charlotte, NC. It is capable of holding all our machines and finished goods inventory for shipping. Our manufacturing process will represent a flow shop layout.

**Exhibit 8: Quality**

|  |  |  |
| --- | --- | --- |
| **Indicate the Dimensions of Quality on which you will focus.**  | **Why is this dimension important, given your industry & target market?**  | **Identify the Quality Step(s) on the Process Flowchart / Service Blueprint to which this corresponds.**  |
| Durability  | It is critical that the helmet provides superior protection. A failure to create a durable helmet would result in customer safety issues, a poor company reputation, and potential liability.   | Q1, Q2, Q3  |
| Special Features  | The ability to inflate and deflate the helmet to make it portable and easily stored gives us an edge over the competition and appeals to our target market.  | Q2, Q3  |
| Perceived Quality  | It is important that the helmet appears and feels like a luxury item to command a higher price than the industry average. | Q1, Q3  |
| Aesthetics  | The helmet must have a visually appealing design, as our customers will be seen wearing it in public.  | Q3  |

|  |
| --- |
| **Use the space below to describe any additional Proactive Quality Assurance Plans that are not connected to a specific activity on your Process Flowchart / Service Blueprint.**  |
|  Each week, one finished helmet will be inspected by our Vice President of Technology to check the maximum impact in pounds of force the helmet (inflated to 8 PSI) can withstand before destruction. The max force the helmet can withstand from each week will be recorded and improved with our quality improvement methodologies. |
| **Describe any reactive quality assurance plans. Include a recovery plan should a customer receive poor quality goods and/or services.**  |
| We will provide full refunds for defective products as well as a free replacement. Complaints about quality will be handled and recorded by our customer support team and provided with a free replacement. |

|  |
| --- |
| **If you will utilize a quality/process improvement methodology, indicate which:**[ ]  NA [x]  TQM [x]  Six Sigma [ ]  ISO [ ]  Benchmarking [ ]  Other (specify what): ***Note: You will not use all of them; only those with highest relevance.*** |
| **Provide a specific explanation of how your chosen quality methodology relates to your business and how it will be applied:** |
| We will implement Six Sigma by having a four-week trained “black belt” using DMAIC with a focus on achieving the Pareto effect. We will reduce variation by having our black belt oversee trained employees. We will standardize processes using automation where possible to remove human error. TQM continuous improvement will occur because our Champion will record where and why each defect occurs and work to improve the processes that cause the majority of errors. Whenever there is an opportunity to improve our process we will implement the change immediately, to achieve continuous improvement. Involvement of everyone will allow employees to record defects and encourage them to participate in management meetings. We will achieve customer satisfaction via quality at the source, so employees are all individually incentivized to meet specifications and correct mistakes.  |

**Operations Exhibit 9A: Inventory, Suppliers and Distribution**

***RAW MATERIAL INVENTORY & SUPPLIER SELECTION*** *If your organization does not have raw material inventory, please check this box*: [ ] NA

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Item(s)** | **Supplier Name & Location (City, State, Country)** | **Reason for selecting this supplier** | **Supplier lead time (in days)** | **Frequency of replenishment (in days)** | **System of Management** | **Mode(s) of Transportation** |
| Butyl rubber | CGR Products Inc. (Greensboro, NC) | Location. Strong track record with big name customers.  | 1 day | 30 days | Choose an item. | [x]  Highway [ ]  Rail[ ]  Waterway [ ]  Air |
| Kevlar  | Fibre Glast Developments Corp. (Brookville, OH) | Cheapest product for highest quality. | 1 day | 30 days | Choose an item. | [x]  Highway [ ]  Rail[ ]  Waterway [ ]  Air |
| Air valve | Woods Manufacturing Co. (Wood Dale, IL) | Custom make valve required for cheap. | 4 days | 30 days | Choose an item. | [x]  Highway [ ]  Rail[ ]  Waterway [ ]  Air |
| Adhesive | Aron Alpha Industrial Krazy Glue. (West Jefferson, OH) | Highest quality adhesive. | 4 days | 90 days | Choose an item. | [x]  Highway [ ]  Rail[ ]  Waterway [ ]  Air |
| Velcro | Heico Fasteners Inc. (Hickory, NC) | Location. | 1 day | 90 days | Choose an item. | [x]  Highway [ ]  Rail[ ]  Waterway [ ]  Air |

Note: Air Pump ordered as Finished Good

***FINISHED GOODS INVENTORY*** *If your organization does not have finished goods inventory, please check this box*: [ ] NA

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Finished goods produced** **(per hour)** | **Frequency of shipping finished goods** | **Average level of Finished goods inventory on site** | **Amount of safety stock on site** |
| At the end of Year 1 | 9.35 | 1 day | 37.4 units |  |
| At the end of Year 2 | 12.8 | O: 1 day R: 5 days | O: 46.08 units R: 25.6 units |  |
| At the end of Year 3 | 18.6 | O: 1 day R: 5 days | O: 66.96 units R: 37.2 units |  |
| At the end of Year 4 | 28.35 | O: 1 day R: 5 days | O: 90.72 units R: 113.4 units |  |
| At the end of Year 5 | 46.075 | O: 1 day R: 5 days | O: 129.01 units R: 276.45 units |  |

O = online orders. R = retailer orders. Expected percentage of retailer orders by year: 1 = 0% 2 = 10% 3 = 10% 4 = 20% 5 = 30%

*Unlimited lifespan, no perishability.*

**DISTRIBUTION** *If your organization does not require distribution, please check this box*: [ ] NA

|  |  |  |
| --- | --- | --- |
| **Name of transportation provider/carrier** | **Reason(s) for selecting this provider/carrier** | **Frequency of Pick Up / Drop off** |
| UPS | Most suitable for online orders. Well-known and reliable. Cheap rates. | Everyday |
| Old Dominion Freight Line | Cheaper and more suitable for retailer orders. Industry leading low claims rate. | Once per week (Friday) |

**Exhibit 10: Capacity & Resources**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Demand****(per hour)** | **Capacity****(per hour)** | **Utilization****(%)** | **Hours of Operation**  | **Bottleneck name and description**  | **How will you manage /adjust the bottleneck to ensure you can appropriately serve or supply your customers?** |
| At the end of Year 1 | 9.35 | 12 | 77.92% | 9:00am-5:00pm | Vulcanizing- process takes 5 min per unit. | New Vulcanizer and Machine press + hire 2 workers. |
| At the end of Year 2 | 12.8 | 15 | 85.33% | 9:00am-5:00pm | Stitching + attach Velcro. Stitching Kevlar to Rubber + Velcro to straps. | New stitching machine + hire 1 worker. |
| At the end of Year 3 | 18.6 | 20 | 93% | 9:00am-5:00pm | Stitching + attach Velcro. | New Vulcanizer + Separate stitching from attach Velcro + separate machine pressing from attaching valve + hire 3 workers. |
| At the end of Year 4 | 28.35 | 30 | 94.5% | 9:00am-5:00pm | Stitching + attach Velcro | 2 New stitching machines + New Vulcanizer + New Machine Press + New saw to cut Kevlar + hire 5 workers. |
| At the end of Year 5 | 46.075 | 48 | 95.99% | 9:00am-5:00pm | Vulcanizing | Adjust bottleneck with similar methods to previous depending on demand. |

**Show your calculations for the following parameters at the end of Year 1.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Hours of operation/month**  | **Demand/month** | **Demand/hour** | **Capacity/month**  | **Capacity/hour** | **Utilization**  |
| 250 days \* 8 hours / 12 months = 166.67 | 166.67hrs \* 9.35 (demand per hour) = 1558.33 demand/month | 18700 /250 days /8 hours = 9.35 demand/ hour | 160 hours \* 12 = 1920 capacity/month | Year 1 bottleneck is 12/hour | 9.35 demand per hour / 12 capacity per hour = 77.92% |

|  |
| --- |
| Machine pressing of rubber and stitching Kevlar and strap to the helmet have a significant impact on capacity at start up. These are appropriate because they will be able to meet the demand without too low of a utilization rate and the capacities are able to be increased easily individually.  |
| As resource requirements vary with time, we will adjust with the following. Prior to year 4, Machine rubber press and Using adhesive to attach valve along with Stitch Kevlar to helmet and attach Velcro to strap will no longer be completed by the same workers. Two workers will be hired to complete attaching Velcro to strap and Using adhesive to attach valve individually. The other adjustments to machines and workers can be seen in the table at the top of this exhibit.  |

**How will you manage seasonality?** *If your organization does not have seasonal demand, please check this box*: [ ] NA

Demand variation by month is minimal. A slightly higher utilization will be used September- December.

**Exhibit 11: Income Statement**

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**Exhibit 12: Balance Sheet**



**Exhibit 13: Cash Flow Statement**

**Exhibit 14: Financial Statement Notes**

Note 1: Accounting methods.

The Company uses straight line depreciation rates for depreciation in accordance with the MACRS rates set by the IRS. The asset classes for assets are 22.2, 30.1, and 30.11 (<https://www.irs.gov/publications/p946#en_US_2022_publink1000107513>)

Note 2: Assumptions

The assumptions below are made while creating the pro forma financial statements.

* Accrued wages are assumed to be the last two weeks of the annual wages.
* The accounts payable are assumed to be the first purchase of inventory for the next year.
* Research and development is assumed to be 8% of revenue.
* Advertising is assumed to be 10% of annual revenue.

Note 3: Investment

The start up cost will be funded by a $100,000 bank loan for 5 years at 8.5% interest. Along with $200,000 of convertible notes with 6% interest. We also have $100,000 of capital supplied by the owners’ personal funds.

Note 4: Capital investment.

The company uses $17,507.50 of the bank loan and $17,507.50 from the owners’ funds to invest in machinery used in producing the product. The rest of the funds are used to invest in inventory for the company in year 1. All other purchases are made with cash from the business operations.

Note 5: Risks

* Risk with ride share apps: With the advance in technology for transportation it is not certain if many people will use these apps instead of bikes as transportation in metropolitan areas.
* Risk with year one efficiency: With the current state of asset turnover and cycle time, it is unpredictable if the company will make it to the point of being more efficient and moving inventory into products in later years.
* Risk with other products: There is a risk that consumers might choose to go with a product similar to ours or just pick a normal helmet. We do not yet know how people will compare our product to the already existing product.

**Exhibit 15: Financial Ratios**



**Exhibit 16: Financial Ratios**

**Liquidity:**

Our company’s current ratio is slightly above the industry average in the first 3 years. In years 4 and 5 it increases much higher than the industry average. This is the same as our quick ratio, it starts above the industry average and continues to rise. In our company we did not have to spend a lot of money on machinery to meet the demand. This is different compared to most of the industries, where they spend much more on equipment. The issue our company has is the operating cycle. We do not invest a large amount of money at the beginning of year 1 on equipment we are not as efficient. As the years go on, we get the operating cycle lower than the industry average. By having an above average operating cycle and keeping our current inventory numbers, we will always have a surplus in inventory.

**Financial Leverage:**

Our company did not take on a lot of debt at the beginning. Our company pays off all debt by year 5 and uses cash to purchase the majority of what it needs with current operation levels. This is different from the industry, where the average company has a lot of debt and the burden of high interest payments. The debt that our company took out was for beginning inventory and half of the value of equipment. $200,000 of this came from angel investors in the form of convertible debt, $100,000 from a bank loan, and $100,000 from owners’ funds.

**Asset Management:**

The inventory turnover is much lower than the industry average, which might indicate that too much inventory is on hand during that time. Although this might be the case, in recent years with COVID-19 supply chain problems, having more inventory is potentially a good thing.

**Profitability:**

The company profit ratios show that the business will be profitable after the first year. Having less debt at the start with minimal start-up costs enables the company to make profits early and invest the profits back into the business. The gross profit margin is consistently above the industry average and shows that the business will be able to make a profit earlier than most other companies in the industry. The operating profit margin begins below the industry average until year 4, then rises above the average. With the return to assets starting below the industry average in the first year, then staying above average, we are getting more out of our assets than competitors. In the long run, having ROA above the industry average can give us an advantage in the market.

**DuPont Analysis:**

The company will have returns that differ from those of the industry average. We have an asset turnover that is below the industry average, an equity multiplier that is above the industry average, and a profit margin that starts below the industry average then rises above it. Buying excess inventory is what makes the difference with our company and, going forward, buying less to get closer to the average.

**Valuation Method:**

To conduct our evaluation, we used the method of multiples. We used our projected revenues from our ratios and calculations and applied them to the price sales ratio. With these calculations we know that our P/S ratio is 0.73.

**Meet Our Team**

|  |  |
| --- | --- |
|  | My name is Samantha Elliott, and I am a junior Marketing major at James Madison University. I am from Philadelphia, Pennsylvania and I am a member of Women in Business and the American Marketing Association. I enjoy spending time with my family, friends, and cats. My hobbies include horseback riding, reading, and listening to music.   |
|  | My name is Matthew Guins, and I am from Virginia Beach, Virginia. I am an accounting major at James Madison University. I am the Vice President of the JMU Club Golf team, and work as a manager at the university's recreation center. When I have free time, I like to work on my golf game.  |
| Inserting image... | My name is Nicholas Marks. I am from Virginia Beach, Virginia, and have lived there my whole life. I am a junior finance major at James Madison University. I am involved in the Financial Management Association and manage a personal portfolio of equities. In my free time, I enjoy surfing, snowboarding, and working out.  |
|  | My name is Nicholas Pike, and I’m from Gainesville, Virginia. I’m a junior management major at James Madison University. I have participated in an entrepreneurial accelerator program at the Gilliam Center in the University. I’m currently learning German and plan to move there after graduating. I love pets and have two dogs at home.   |
|  | My name is Austin Polhamus, and I am from Ashburn, Virginia. I am majoring in Marketing with a minor in Sports Communication. In my free time I like to play soccer, workout, and watch a lot of sports such as soccer, hockey, and football.  |
|  | My name is Darius Shuler, and I am from Lorton, Virgina. I am a Marketing major at James Madison University. I am currently in a professional development organization called Phi Gamma Nu as well as Black Student Alliance. In my free time, I enjoy reading, exercising, and watching sports.   |
|  | My name is Olivia Smith, and I am from Norfolk, Virginia. I am a junior accounting major here at James Madison University. I play club field hockey for JMU and am joining Boarderline, a ski and snowboard club this semester. I like to spend my free time with family and friends as well as crocheting, cooking and walking my dogs.   |

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