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Goodyear Project - Mile Marker 0

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Last Mile Delivery

Mile Marker 0

Benjamin Benton, Tyler Henning, Nolan Howard, Matthew Kennelly, Catherine Rardin

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Introduction

There are many rapid changes and trends that are going on in the current automotive marketplace. These trends going on with ridesharing, autonomous vehicles, electric vehicles, platooning, and many more are all going to change the way consumers interact with the industry and Goodyear would be wise to expand and invest into many of these growing markets. Our team has been tasked with helping Goodyear explore into a new area and we have decided to focus on last mile delivery because it is expanding at an extreme rate and has a large opportunity for Goodyear to join as a large player in the market.

Our goal is to provide Goodyear with an industry analysis and ideas for how they can capitalize on the current boom in the market to fill a hole in the current last mile delivery market. Before we can make recommendations on how Goodyear should proceed into the market, we do research in order to get an understanding of where Goodyear can fit in. By doing this we will be able to get an understanding of not only what last mile delivery is and what is going on in the last mile delivery market, but also understand what Goodyear currently offers and their position in the market. We will also be able to understand what competitors there are not only in the last mile delivery market, but also what competitors Goodyear faces in their current parts and services industry. By analyzing the current standing of the industry and what already exists and what obstacles are in place, we will get an understanding of exactly where we believe Goodyear should position themselves in this market and what they will be able to do.

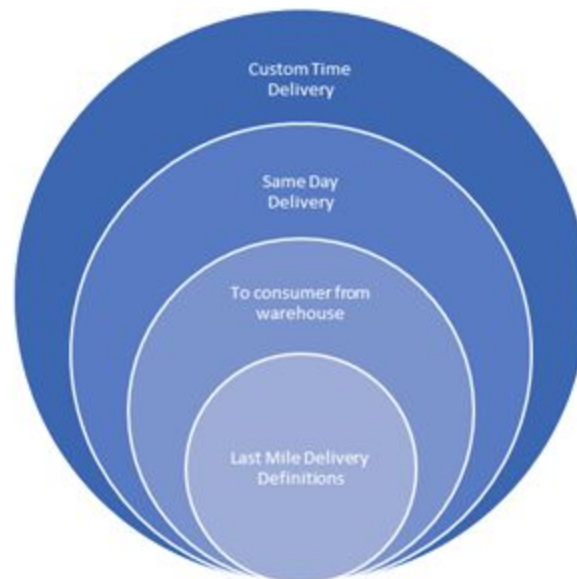
The goal of this report is to get an advanced understanding from an outsiders' perspective so we will have more insight and direction to guide us for our primary research. By expanding

our knowledge in the secondary research phase, we will have more to offer once we begin to reach out to insiders during the primary research.

Before the analysis of the market can begin, the term “last-mile delivery” must be defined. We will define this term even though the industry does not seem to be able to come to a consensus on what exactly last-mile delivery is. In one of the pioneering pieces written about last-mile delivery: “Whatever You Call It, Just Don’t Think of Last-Mile Logistics, Last”, many different experts give their own opinion of what they believe last-mile delivery to be (Goodman 2005). The CEO of Distribution Solutions International defines it as “the point from which the consumer or commercial address receives the individual order”. The CEO of NonstopDelivery came to a similar conclusion, defining last-mile delivery as the last-mile from a distribution point like a store or warehouse (Goodman 2005).

However, not everyone finds the definition to be this simple. Many experts believe that there is a time element that must be considered when speaking on the topic. RedPrairie’s VP of transportation equates last-mile delivery with same-day delivery. Similarly, the VP of Critical Service Logistics defined it as “It’s the time-sensitive delivery of parts to the ultimate end user in a way that’s time-specific as opposed to, you get there when you get there on the route or when the parcel delivers. It’s a custom time delivery.” (Goodman 2005). The time element has become even more prevalent than ever between companies like Amazon offering free two-day delivery and many grocery chains offering to deliver groceries to the customer’s home hours after they put in an order.

Consumers have higher expectations from companies as to when they should receive the products. This applies not only to individuals but also to companies that are ordering supplies or machinery that are essential to their business. Many of these companies will pay a premium in order to receive their products faster. However, with the current offerings Amazon and other companies have, low costs are becoming an expectation. Below is a graph that shows the relationship between these definitions. The circles start with what they all have in common and each new outer layer is how a firm took another firm's simpler definition and expanded it with another concept.



For our purposes, both the distance and time elements will be integral to our definition and recommendations. Our definition of last-mile delivery is: “the process of delivering products from the storage facility to the end user during a strict, short time period”. Just as important as the transporting of goods from the warehouse or storage facility to the customer is the timeframe in which this transport gets done in. Customers expect the process to be streamlined and faster

than traditional delivery options such as the USPS postal service (excluding options like next-day delivery, which can be considered last-mile delivery in many respects). The focus regarding last-mile delivery will be the combination of efficiently delivering goods from a warehouse or other receiving plant to the customer in a timeframe that is faster than other shipping options.

While last-mile delivery seems like a novel concept that has arisen in the last few years, it was attempted during the dot-com bubble in the late 1990s (Duiven, Tipping, Laseter; 2018). During this time, players like Webvan emerged and were trying to take advantage of the booming e-commerce industry blossoming at the time. However, like many companies that started up at this time, they were unable to make it through the crash of the market surrounding internet companies. Many companies at this time were being overvalued and inflated due to other successful giants like Google, Microsoft, and Yahoo. Investors were trying to get in on the next big computer company. However, this falsely drove up prices to points that these companies could never hope to reach, and thousands of companies failed.

This was the case for these predecessors in the last-mile delivery market. Companies like Webvan and Kozmo ran into the issue of limited internet sales and high costs of delivery at the time (Laseter 2000). This was especially an issue for these providers because they had limited warehouses and distribution centers. They also were only able to sell products that they could have on hand in order to be able to meet the quick delivery turnaround. Most of these companies planned on being able to specialize in specific products that consumers would want within a few

hours of ordering and try to offer those products for delivery the same day within hours of ordering.

However, this model was very inefficient and expensive. For example, Laseter assumes that the cheapest delivery costs for Kozmo were \$10 per delivery (excluding overhead). Their average order was only \$15, and delivery is offered free. This would become a major issue because it doesn't factor in the cost of the actual product and it is easy to see how Kozmo is losing money on their average delivery. Within a few years of their startups, these companies were starting to fail and go under with other online businesses. Nevertheless, these companies would lay the groundwork for future successes.

The largest player in the current last-mile delivery market is Amazon with their two-day delivery model. This started out in 2005 and has been expanding exponentially ever since (Rubin 2019). Amazon rolled this process out as a part of Amazon Prime, which started in the same year. Amazon Prime offers consumers the opportunity to pay a flat fee upfront and receive free two-day shipping for numerous products. Amazon Prime is also expanding at rates that are unmatched. In 2015, there was a growth of 35% during the year, with the final number of subscribers being estimated at 54 million (Isidore 2016). In April of 2018, Jeff Bezos admitted that there were more than 100 million Amazon Prime members (Kelly 2018). Amazon did expand their offerings under prime into many other services, but there is no longer the issue of whether there are enough sales to sustain the industry. They are the largest company that offers last mile delivery without being focused mainly on delivery (such as UPS and FedEx).

As the industry has continued to grow, there have been many new competitors and opportunities that have sprung forward. Many companies are pulling out all the stops and trying to expand into the market. As our industry analysis will clearly show, there is a lot of room for growth within last-mile delivery.

Industry and Market Analysis

Introduction

This industry and market analysis section will be covering several topics that affect Goodyear. The first topic to be considered will talk about the industry itself and our findings about the industry through our secondary research means. After elaborating on the industry, it is essential to focus on what competition there is within this industry. The discussion on competition will only be brief in this section but will be much more in-depth in our next section titled Competitors Within Last Mile Delivery and Potential Hurdles. Following the overview of competitors an outlook of what is expected of the industry will take place. This outlook will also be essential for Goodyear to know as they will not want to proceed into an industry that has no potential to grow. As a wrap up of the Market analysis section, we will try and make an assertion on what market segment should Goodyear target.

Industry Analysis

As explained in the introduction to the report, last mile delivery focuses on the delivery and time components associated with the shipping process to get the product in need to the consumer. One of the problems with researching this material is the fact that last mile delivery

should probably be its own industry. Last mile delivery should be its own industry, at least soon, due to how different and how specialized it is compared to normal delivery services. However, since last mile delivery is relatively new compared to other industries and has not really achieved a point of universal satisfaction, it must be lumped in with the couriers and local delivery services industry.

For the sake of consistency, any mention of the word industry within this section will relate to the couriers and local delivery services industry. Companies that are looking into last mile delivery should know about the difficulties of trying to succeed in this industry. High startup costs and wasteful inefficiencies are bound to exist within this industry according to carriers and retailers (Hadad 2018). Something to note within the industry is that there is a staggering number of competitors alone within the industry. Over 191,000 companies are currently competing in this highly concentrated industry with the United Parcel Service Inc, also known as UPS, and FedEx Corporation leading the market (Hadad 2018). While there is a staggering amount of companies within this industry, this can be taken lightly for the most part as not every company will be able to perform last mile delivery. While it is certain that there are few actual last mile delivery businesses, it is uncertain as to the actual amount of total last mile delivery businesses.

As previously mentioned, last mile delivery is costly and inefficient. If one company were to specialize in last mile delivery, they would have a huge advantage in that geographic area. This is due in part because it is very likely that no other company would be able to perform the same type of last mile delivery services since it is hard to replicate. No companies have

optimally performed last mile delivery. The companies that are closest to optimizing last mile delivery are Amazon and UPS. For more information about competitors and these companies, please refer to the Competitors Within Last Mile Delivery and Potential Hurdles section.

Market Analysis

The market for last mile delivery is continuously expanding. With brick and mortar stores closing, people are buying more and more from online stores. Purchasing from online stores means that the products need to be shipped from one point to another, a local warehouse to the consumer. The problem with this for online retailers is that they do not have the capacity to deliver goods efficiently. Amazon, FedEx, and UPS all struggle to deliver the goods on time without going through ethical concerns like Amazon. When they do deliver goods on time, it is extremely costly as these companies are overly utilizing every resource available. Some companies have taken to try and reduce this cost and increase efficiency through other means. As most of these means will be discussed in the next section, we will only focus on Walmart for the time being and how it will relate to Goodyear.

Walmart has tried to work with the last mile delivery system by using their employees as a gateway for deliveries. Walmart decided that it would be best to have store employees deliver orders from the store to its destination on their way home from work (Hadad 2018). According to the source, Walmart did not receive positive results in terms of this experiment. Another source elaborates on this citing several issues that were brought up by anonymous employees involved in the trial. These issues were a lack of legal awareness and preparedness, lack of valued compensation, and overall skepticism from the employees (Bose, 2018). This led to the corporate

giant cutting the program as they continue to find a way that is less costly and more efficient to deliver goods straight to the customer.

The significance of this is that a similar technique, or any technique that is very large in scale, will likely not work for Goodyear. Goodyear's size in terms of dealers and locations rivals that of Walmart. Walmart is a large company that hoped to utilize its size by allowing employees from every location to participate in its own last mile delivery system. Goodyear would also likely want to utilize its size the same way, however; they will likely still face the same problems Walmart has. To compensate for this, Goodyear can try to work and make its employees aware of the legal agreements and issues that could arise such as who would pay for the car insurance. They can also find ways to manage proper compensation for its employees which may also solve the skepticism problem at the same time. But to do this on such a massive scale might prove difficult like Walmart's experience as this specific practice would be new. Likely, employees would not have heard of this initiative before and would still be skeptical if this is being implemented globally. Adding onto this is that retail employees would likely be more open and less skeptical to delivering retail goods and should theoretically be less skeptical than mechanics delivering parts or products to consumers. Since this statement is only theoretical, this would be a great question to ask Goodyear in our primary research.

Since focusing on a larger scale may prove difficult, focusing on a smaller scale would likely be better. Focusing on a smaller scale would allow Goodyear to build trust in its employees for this type of system. By building trust with its employees, Goodyear should be able to eliminate any extreme skepticism that would hurt the last mile delivery movement. The reason

for saying extreme skepticism is that we do not want to eliminate all skepticism as this is a prototype and will want true feedback in which skepticism is good. Regardless of the method chosen for introducing the small-scale last mile delivery, reducing skepticism to anything new will bring benefits to the new system. Working in a small scale will also prove beneficial due to the high startup costs preventing much rapid growth globally. The much lower startup costs for implementing any last mile delivery on a smaller scale should be reasonable and advantageous. Operating on a smaller scale and other topics involving what Goodyear can do with last mile delivery will further be discussed in the last section titled Goodyear, and How They Can Utilize Last Mile Delivery.

Competitors Within Last Mile Delivery and Potential Hurdles

This section of the report will discuss the current state of the competition within the Last Mile Delivery market, and it will also look at the potential hurdles or issues that companies will face or are facing in the market. It will discuss the different competitors who currently have a large market share, such as United Parcel Service (UPS) and Federal Express (FedEx), and it will discuss the up-and-coming companies within the market, like Amazon.

Competition Within the Market

The following section will discuss the landscape of the Last Mile Delivery market, and the different competitors within the market. The analysis will focus on the larger players in the market, UPS and FedEx, as well as the newer companies entering the market, like Amazon. In terms of the Last Mile Delivery market, this paper will not include the United States Postal Service (USPS) as that company is considered to be operating in the “Postal Service” industry,

and not the “Couriers & Local Delivery Services” industry (IBIS World, 2019). There are also different types of Last Mile Delivery that smaller companies are beginning to implement, an example being “crowdsourcing,” where companies like Postmates and UberRush post a delivery job to one of their apps, and then independent delivery drivers are able to claim a job (Shiphero, 2019). This type of delivery method is smaller and newer, so a lot of companies are just starting to investigate this type of delivery.

According to IBIS World, the current market is dominated by the companies mentioned above, UPS and FedEx, with a market share of 53.1% for UPS and 24% for FedEx (IBIS World, 2019). That adds up to 77.1% of the industry tied up between the two largest companies in the market. An important thing to note about this industry is that while it is highly concentrated to the two largest companies in UPS and FedEx, it is also very fragmented. The industry is fragmented when it comes to the segmented local markets. It is very possible for a company to “dominate” a local city or town without having a large percentage of the overall market share (IBIS World, 2019). This is due to many companies operating their business within a specific market or geographical area.

Another part of the industry that is important for the analysis is the type of delivery these companies do. The main types of delivery that occur in this market is “Ground Deliveries” and “Air Transit Services,” and Ground Services account for 55.7% of the service segment within this delivery, and Air Transit accounts for 43.0% (IBIS World, 2019). It is worth mentioning that the Air Transit Services is concerned with the long-distance shipping services offered by airplanes to get packages to the appropriate destination quicker, not the idea of drone delivery or

similar “air” service. Very briefly discussing drone delivery, delivery of packages would only ever account for 1.3% (or less) of the market (IBIS world, 2019). This is not to say that the idea of implementing drone delivery as a standard option in the near future is out of the question, just that currently it is a very small percentage of the overall market due to potential problems with large-scale commercial drone delivery, such as a greater level of theft, weather impact, and drone abuse (Enderle, 2019).

Continuing on with a more in-depth analysis of that small 1.3%, another growing trend that has the potential to grow even more is the idea of Unmanned Delivery, and Unmanned Delivery means delivery of parcels or packages by autonomous vehicles, unmanned aerial vehicles (drones), or by intelligent robots (Wang, Wang, Ma, Liu, 2019). Autonomous vehicles discuss the idea of having an unmanned vehicle make deliveries, using the most efficient routes and by decreasing the need for human labor. The obvious issue with this idea is that driverless vehicles are just not ready to be used in that sense yet, as the technology is not there. For example, Toyota had to recall 31,000 Prius’ with automatic braking, where the system installed faulted and would automatically brake at high speed, and a Tesla car accelerated into a highway barrier and killed its driver (Hobbes, 2019). The unmanned aerial vehicles, or drones, is something that has been slowly implemented in select places globally. Companies like Amazon Prime Air and Google Wing are actively testing and using this type of delivery system (Wang, Wang, Ma, Liu, 2019). This new type of delivery system does not come without issues, as there are concerns of, “restricted applicable regions, limited coverage, and high device costs” (Wang, Wang, Ma, Liu, 2019). Finally, there are also companies that are looking to implement intelligent robots as a possible way to increase the efficiency of the last mile delivery market.

Intelligent robots are already being used in many large corporations, such as Amazon and Alibaba, the Chinese E-Commerce giant, have already been using robots to increase the automation of their warehouses (Chai, 2018). Companies are beginning to replace humans with robots to do simple “on-campus” parcel delivery, or delivery within the campus of the company. However, due to several challenges within the environment for robots, they are primarily used as secondary delivery carriers due to the limited capacity they have and the geographic limit they face (Wang, Wang, Ma, Liu, 2019).

The next section will look at the Last Mile Delivery market and look at the challenges that the industry is facing.

Hurdles

This portion will have a primary focus on the problems or hurdles that companies within the Last Mile Delivery market are facing. These problems include inefficiency, the consumer need of transparency (shipment tracking), as the industry describes it, friction, and high cost. These problems or hurdles are the main issues within the market, but there are smaller ones that will also be discussed in this section.

The first and likely the most important issue that all companies and players within the market are facing has to do with the efficiency of the last mile delivery. An IBIS World article suggests that while Last Mile delivery is the last leg of the trip (i.e. a package getting delivered), it is the least efficient segment on the delivery process (Hadad, 2018). Another way to think of the efficiency issue within the market is to compare it to travelling between two different cities versus travelling within one. It costs roughly \$300 to travel from Seattle to Miami on a plane.

When compared to traveling the same distance of 3,300 miles by taxi, at \$2.70 per mile (Seattle's average taxi rate), the cost is reaching \$9,000 for that same trip (Hadad, 2018). This is because companies that offer services within the Last Mile delivery market are unable to take advantage of economies of scale. Encyclopedia Britannica defines economy of scale as, "...the relationship between the size of a plant or industry and the lowest possible cost of a product. When a factory increases output, a reduction in the average cost of a product is usually obtained" (Encyclopædia Britannica, 2011). Last Mile Delivery is inefficient largely due to the cost of transporting individualized shipments to distinct, often unreliable destinations through constantly changing routes (Lopez, 2017). What this means is that the last mile of the delivery of a package to someone is often unpredictable. Drivers must deal with the uncertainty of customer availability, which includes customers being able to be handed their package to avoid theft. Also, a delivery driver in a busy metropolitan area may have to drive on a different route than what is fastest, deal with congestion on their routes, or they might have to sit in traffic for long periods of time. All of this is combined with the expectations of having packages guaranteed to be delivered within a 2-day window after ordering.

People are increasingly demanding to know where their package is always and want to know exactly when it will be delivered. Currently, courier companies like UPS, FedEx, and USPS update their customers when the product is scanned at a location (such as, when an item is scanned into the shipping center, when the item is scanned as it enters the truck, when it is scanned as it enters a fulfilment center, etc.) (UPS, 2019). Now, thanks to the real-time technology and GPS tracking of certain companies like Uber or Lyft, people are starting to expect the same thing from their delivery services. It is still in its early stages, as companies are

just starting to focus on bringing this feature to its shipping services. For example, there is a new startup company called Tive, that has created a product that helps solve this problem. Tive released the Tive Solo, a real-time visibility tracker, which, “provides real-time visibility across the supply chain” (SupplyChain24/7, 2019). The sensor is currently being used primarily in the B2B sector, and it allows supply chain managers to keep track of their shipments and the condition of them in real time. This is something that Last Mile delivery companies can start to look into (if they haven’t already, such as FedEx with their system called SenseAware, something they just introduced this year (FedEx, 2019)), and begin to implement it on the consumer side.

A third hurdle that courier companies in the Last Mile delivery industry must deal with is this idea of a “frictionless” delivery system. What friction means in this sense is the experience and communication between the customer and their delivery, whether this is post-delivery or pre-delivery. An example of what consumers expect when getting their deliveries is found in an article titled *Demystifying the Crowd Intelligence in Last Mile Parcel Delivery for Smart Cities*, where it states, “...it is difficult to achieve time-precise delivery. Users always prefer more convenient and secure delivery service such as home delivery with a signature of reception rather than dropping off parcels at the door. If no specific time window is allowed, the missing reception rate can be high since recipients are not likely to wait at home all day” (Wang, Wang, Ma, Lui, 2019). This is what “friction” refers to. The friction in the industry comes from when people cannot receive their package, and get a note on the door saying, “We’ll try again tomorrow.” This then leads the consumer to become irritated or even mad at the parcel-delivery companies like FedEx or UPS over their package not being delivered, or it causes them to

contact customer service or something similar and complain or request more information. This requires much a representative from the company to then be involved with this shipment, where had the package been delivered, this would not be an issue. This problem is something that all companies must plan for, as packages are not delivered constantly, or packages are stolen or delivered to the wrong address. Companies must have a system set up to address this issue.

Another prevalent obstacle within the Last Mile delivery market is the high cost. Carrey Mantey writes in her article titled *Overcoming Last-Mile Delivery & Urban Logistics Obstacles*, “Last-mile delivery is historically inefficient and requires a higher percent of cost compared to other areas of the transportation process—up to 40 percent of total transportation costs can be weighted in the last couple of miles of delivery” (Mantey, 2017). She later goes on and discusses that one of the main reasons Last Mile delivery is so costly is due to the changes in “urban logistics,” which is the delivery of goods in cities. Urban logistics are changing, as cities are beginning to use and implement regulations around truck access, after-hour delivery times, noise reduction, and pollution (Mantey, 2017). A challenge for many companies that provide service in this industry is how they try to meet the demand of consumers for quick and easy package delivery, but while also maintaining a profit while doing so. This problem is something that people are beginning to look towards AI and other similar technology upgrades to try and help solve.

Last Mile Delivery Utilization

In this section of the analysis, we will evaluate the possible uses of last mile delivery, and what sorts of products and/or services that Goodyear can incorporate into their business for

maximum productivity and profitability. Of course, manufacturing and selling tires is a huge part of Goodyear's business model. They produce tires for many different forms of equipment such as automobiles, trucks, motorcycles, and even planes. Thus, it can be said that Goodyear has an enormous market share in the field of selling tires. However, Goodyear has been underperforming as of lately. Shares fell 16.5% in August of this year, 2019, only continuing their subpar stock performance in 2019 (spglobal). They need something innovative, something that can significantly boost company performance and can catapult them into the needs and wants of the modern world. The answer to that is last mile delivery.

Products and Services

If Goodyear would like to further grow their brand, they need to expand upon the products that they are currently selling. According to Ibisworld, falling demand from automobile manufacturers and a rise in foreign competition will cause the tire manufacturing industry to decline, so they need something new. A way to accomplish that would be to offer other additional parts and services to customers that are in need. Statistics show that projections of revenue of automobile body, paint, interior, and glass repair in the U.S. will amount to approximately 49.2 billion U.S. Dollars by 2023 (statista). Currently, it is at about 39.73 billion. The fact shows that with more automobiles being built each year, the market for repairs is only going to continue to grow. People who own any kind of vehicle are always at risk, some more than others depending on the make and year of the vehicle, of something failing or needing a tune-up. This is where Goodyear comes into play. Not only will they have the capability to

service these people, they will also be able to reach them with the product and service that they need at expeditious rates. This will be explained in the following paragraphs.

Market Opportunities

As stated previously, companies like Amazon are dominating the e-commerce world. They are implementing continuous improvements and innovations into their core business model, allowing them to generate large amounts of revenue and net income. At the base of all that though, is last mile delivery. A survey last year concluded that 46% of people would trust Amazon to deliver their packages more than FedEx, UPS, USPS, and DHL (statista). That is a significant amount and goes to show that there is potential for Goodyear to go far with using last mile delivery. Many people out there are open to other delivery methods from the big transportation companies like FedEx and UPS, as evident with Amazon. Goodyear needs to jump at this opportunity and incorporate the last mile into their operations. By offering customers the option to order parts and services for their vehicles and having them delivered at speedy rates, the opportunities are endless.

The world of e-commerce is constantly changing and evolving, so companies like Goodyear would need to stay on top of that and change with it. Staying up to date with the latest industry trends can help retailers adjust and optimize their order fulfillment process as needed. Specifically, for Goodyear, certain trends are more fitting than others. Topics that we are recommending for Goodyear to utilize are the following: rapid order fulfillment, in-house delivery services, upselling during delivery, and improved traceability.

Rapid Order Fulfillment

Rapid order fulfillment is essential for any company looking to stay competitive within the e-commerce industry. Delivery times such as 2-day, 1-day, and even same-day have become the norm nowadays. Retrieving orders as quickly as possible is very important as evident of the fact that 41% of consumers said they would be willing to pay more for same-day delivery (Masters, 2019). These are obtainable through various methods such as warehousing in major cities, minimizing route inefficiencies, and using different forms of transportation such as planes or drones. Having warehouses set up in the major cities across the world will significantly reduce delivery time. Orders placed by customers can be conveniently pulled from local warehouses, packaged, and sent out. This is ideal because products do not need to be taken a far distance to get to the customer. Another way to accomplish rapid order fulfillment is to minimize route inefficiencies. Have a route that is set up where deliveries can move swiftly from one location to the next. This means not having overlapping routes and/or delivering packages to locations that are too out of the way. Each delivery vehicle should have a certain area that it covers. Lastly, utilizing different forms of transportation is essential to getting the order in the hands of the customer. When ground transportation is too time-consuming, other methods of delivery such as planes and even drones should be considered. Currently, there are many constraints associated with drone delivery related to flight range and load carrying capacity, but it could still be a viable option (Karak, 2019).

In-House Delivery

The second trend that Goodyear should consider is in-house delivery. In-house delivery means that a company is using their own delivery staff and own fleet of vehicles to get orders to customers. This is a great means of reducing costs when compared to using third-party delivery; outsourcing delivery operations to a third-party company and paying them a delivery fee for it. Many times, customers experience problems when using third-party delivery services and afterwards hold the company responsible for those errors. By utilizing in-house delivery, Goodyear does not have to place the responsibility in companies like FedEx or UPS. They can make sure that they are providing the sure care that each order should have. Also, if a customer is requiring a service for their vehicle, in-house delivery would be necessary. The Goodyear delivery driver will possess the knowledge and expertise on how to service the customer's vehicle in any way that is needed. Obviously, that would not be able to happen if third-party companies were being used. There is potential for a downside here. Technicians might be wasting their time driving around if they are not making any repairs. If it is a sure fact that no repairs are needed, then it would be acceptable to send drivers out that might not know how to perform repairs. If not, then a person that possesses that kind of knowledge should be used to make the delivery and/or perform the repair.

Upselling

Another innovative method to utilizing last mile delivery would be to incorporate upselling into the delivery process. Upselling is simply the act of persuading customers to purchase a product or service at a higher level (Guillet, 2019). In a similar vein, Goodyear delivery drivers can stock their vehicles with items the consumer has ordered in the past or might

need, potentially processing an additional order in person when the delivery is completed. In addition, these drivers can also suggest services that the consumer might need on their vehicle. They can make the delivery, ask to look at the consumer's vehicle, and make suggestions of what it might need, whether that is a new paint job, headlight, or even an oil change. If utilized effectively and in connection with revenue management strategies, upselling has the potential to increase revenues and cut down costs. Upselling focuses on increasing the transaction size per customer rather than acquiring new customers, which helps to cut down the selling cost (Guillet, 2019).

Improved Traceability

Not only do modern customers want to receive their orders more quickly, but they also want to be able to track them throughout the entire delivery process. Improving traceability is essential for a company's success in using e-commerce. In providing last mile delivery, Goodyear needs to utilize the improvements in technology that have made it possible for companies to provide step-by-step tracking information. This way when customers are desperate need of the part or service they ordered; they know exactly when it is set to arrive. A common challenge associated with step-by-step tracking is when national carriers are used. It is easier for packages to go unscanned or even get lost. In-house tracking does not totally solve this problem due to potential network issues, however, it will still be comparably better than not using in-house delivery.

SWOT Analysis

Goodyear benefits from being an already well-established company with a widely recognized brand all over the world and stable economic condition. This recognition will make it easier to enter the last mile delivery market because Goodyear already has a strong customer base that will use its services. People may already see Goodyear as a reliable brand due to past experiences with their products and be more open to buying them. Others may not know as much about other brands, but know of Goodyear, which can compel them to buy from them based on recognition alone. The wide variety of products offered by Goodyear and Goodyear trademarks gives customers the ability to utilize last mile delivery to fulfill many different needs, such as purchasing motorcycle or even airplane tires.

One potential weakness that can be changed to an opportunity are the tire products themselves. Some people may need an immediate tire placement but aren't sure how to install one. It may be beneficial to Goodyear to send mechanics as drivers to deliver the items and install them for an additional fee if possible. This could add a new form of revenue for Goodyear and offset the cost of new delivery and mechanic employees.

Another concern is the overall cost and reliability of last mile delivery. According to IBIS World, the final process of delivery is the most inefficient. Not only is delivery from a distribution center to a direct customer more expensive than shipping items in bulk across the country, but there is a risk that the product could be stolen if left in front of the customer's house, or the delivery man will have to return to the home to deliver the product later.

On a more positive note, the last mile delivery industry has been growing and becoming more profitable according to BusinessWire. People from all over the world utilize it, so

Goodyear can benefit from the growing market at an international level. Goodyear can also capitalize on prospective solutions to the expenses of last mile delivery, such as allowing customers to choose a time to have their item(s) delivered. Alternatively, mechanics can map out their own routes and decide which areas they would like to deliver supplies and operate in. This could raise employee satisfaction and make deliveries faster if the drivers know the area well, saving costs from the time it takes for products to arrive at the destination.

Current delivery services such as UPS and businesses that already utilizing last mile delivery such as Amazon are Goodyear's biggest threats to entering the market. These companies send Goodyear products to customers, which can shut out direct interaction with Goodyear and keep the business from inserting itself into the industry. However, by offering professional services at delivery, Goodyear will offer a unique quality that should allow it to create a competitive advantage.

Conclusion of Secondary Research

With all the information the team found, it is reasonable that Goodyear can enter the last mile delivery as an independent company, rather than relying on other delivery services such as Amazon, by offering on-site services at the time of delivery. Providing both services and delivery at the same time while simultaneously allowing customers to schedule the deliveries will take advantage of the global trend of bringing items directly to customers rather than leaving them in distribution centers or certain shops for pick up. Thanks to Goodyear's global brand, the organization can set a solid competitive advantage in the growing last mile industry by offering services as well.

Introduction to Primary Research

The secondary research that was conducted and provided above shows that the last mile delivery market is something that has potential for Goodyear. The following will provide an overview of what we think would be the most beneficial modes of entry for Goodyear. The report that follows will also contain recommendations and implementation methods for the recommendations.

However, before the discussion of the modes of entry Goodyear could benefit from, there must be a general discussion of what type of research was done, how it was conducted, and what we gained from it. It was made abundantly clear during the secondary research process that last mile delivery is a market that is inefficient, with high startup costs and wasteful inefficiencies bound to exist within this industry according to carriers and retailers (Hadad 2018). The majority of companies operating within the last mile delivery market have a difficult time reaching maximum productivity, and many companies end up wasting resources or manpower, or failing to make the best use of time or resource.

Many companies deal with similar issues. One issue is downtime when a delivery vehicle breaks down or needs to be fixed. When this happens, this can delay the rest of the deliveries for the day, costing the company a lot of lost money. Another issue many face is the lack of staffing measures, which is discussed later in the report. These issues were the issues that stood out as the most important, and, since companies within the last mile delivery market generally face the same issues and inefficient across the board, there is a large opportunity for a company like Goodyear to enter and try to solve the issue of inefficiency.

With this idea in mind, the main idea for the primary research we conducted revolved around the idea of “Speed within the Last Mile Delivery.” In this context, speed pertains to how Goodyear can enter the last mile delivery market as a company that tries to eliminate as much as the downtime and as many of the inefficiencies that other companies face. We have come up with 2 recommendations for methods of entry for Goodyear to potentially enter the last mile delivery market,

The first recommendation we will discuss will be the idea of having an emergency response team. This idea is discussed much more in depth in the following sections, however the main idea is that Goodyear can provide a service for other delivery vehicles, where if a vehicle were to break down or need repairs while out making deliveries, this service would be called and repair the vehicle, decreasing the time the vehicle is out of commission and decreasing the time and money lost.

The second recommendation that is discussed in the report is the idea of offering an insurance service for companies operating within the last mile delivery market. Insurance can provide companies a way to reduce their failure costs. Again, this is further discussed in the report.

Solution #1: Emergency Response Teams

Overview

For Goodyear to be able to expand into servicing the rapidly expanding industry of last-mile delivery, it must focus on the points-of-emphasis for the major players in the last-mile delivery market. For Amazon, the dominant player in the market and the main company Goodyear should hope to pair with, it is all about speed and efficiency. Amazon has captured a large market share by consistently being able to reduce the time that a customer must wait in order to receive their goods. Most goods currently offered on Amazon can be delivered to the customer in two days with a premium Amazon subscription and many household items are now being promised for delivery within a few hours of ordering. This is how Amazon has been able to set themselves apart from their competition and one of their biggest competitive advantages. As such, any hiccup in the process can prove to be detrimental to their reputation or very costly to fix in order to not disappoint customers.

One of the main areas where delays can happen for Amazon is during the last-mile delivery itself. If one of their delivery trucks breaks down, it can be both costly and time-consuming. Currently, when an Amazon van breaks down during their route, they must call another Amazon deliverer and a tow truck to arrive. The second Amazon deliverer comes to pick up the goods the first van didn't deliver on their route and the tow truck then comes to haul the van away (Benton, Interview with unnamed Amazon Driver, 2020). The major cost during this time is going to be the added cost of labor to get these deliveries done on time and meet the deadlines promised to customers.

In order for the second van to be able to deliver the goods from the broken-down van and deliver their own packages, the driver is going to have to work overtime. Not only is Amazon going to have to pay for extra hours for this driver, but those hours are going to come at a 50% premium due to the laws that require overtime be compensated at a higher rate than regular hours. This is also happening while Amazon is paying the driver of the broken-down van to be out of commission and unable to make deliveries (Benton, Interview with unnamed Amazon Driver, 2020).

The other major cost during this time is the opportunity cost of a van being out of service. The longer that this specific van is out of service, the more other drivers will have to add packages to their routes (leading to them likely needing overtime to get everything delivered that day) or Amazon will have to scale down the number of deliveries it does in a day, which can cause customer expectations not to be met. For a company like Amazon, who prioritizes speed and efficiency, these logistical issues are a nightmare waiting to happen.

For Goodyear, finding a way to solve this could land them a huge contract for servicing the Amazon delivery vehicles that would increase revenues and profits considerably from this service line. Our first solution for Goodyear and Amazon would be the creation of emergency response teams. The goal of these emergency response teams would be to expedite the process of fixing a delivery vehicle so it can get back to making deliveries as soon as possible. These teams are modeled after the medical emergency response teams such as paramedics or EMTs.

The first way that these teams could put vehicles back in service would be through immediate on the spot repairs. Items that could be fixed in a timely manner at the point of breakdown rather than requiring the vehicle to wait on a tow to their current service center and

then addressing the fix at the service center. Examples of possible on the spot repairs include (but are not limited to): changing a tire, refill of necessary fluids (gas, oil, etc.), and replacing a windshield.

This would be very similar to how paramedics are able to come to the scene of a medical emergency and fix the issue at hand in a quick manner as opposed to the person waiting in line at a hospital or doctor's office (which in many times is not a viable option). For Amazon, if a company like Goodyear can rush onto the scene and repair an issue in a matter of minutes instead of hours or even days, this leads to major cost savings. If Goodyear can replace a tire in about an hour as opposed to making the delivery van transfer over all of its goods to another delivery vehicle and making the van out of service for the rest of the day, Amazon would be willing to pay a premium for that service (Benton, Interview with unnamed Amazon Driver, 2020).

The second way that these teams could speed up the process of putting a van back in service is by expediting the process at a repair center. Not all issues can be fixed on the spot at the point of breakdown. There is no way Goodyear could have every piece of equipment necessary for every single type of breakdown a delivery van can have in a portable fashion. Goodyear cannot realistically become a full force service center on wheels much in the way that an ambulance and paramedic team is not a hospital on wheels.

However, Goodyear can once again take its cues from a medical response team as to how they can expedite the process. Even though paramedics cannot fix every issue, they can diagnose the problem and pass this along to medical professionals in order to save the medical professionals time. The Goodyear response teams could do the same with a broken down van.

They could diagnose whether the issue is with a specific part of the engine or transmission, etc. in order to let the full service center know what they need to focus on as opposed to doing a full diagnosis.

The other way that paramedics help is by having their patients “skip the line” and alerting medical professionals what station they may need to set up ahead of time. When individuals are brought to a hospital by an ambulance, they are often given immediate attention as opposed to having to wait in the waiting room like they probably would if they came in under their own power. The individuals being brought in by paramedics get special treatment due to their emergency status. The paramedics also alert the hospital when they are on their way and the patient will need a special machine like an X-Ray so that the machine can be prepped and ready for the patients’ arrival and the patient doesn’t have to wait for the machine to be set up after they arrive.

Both of these concepts are things that Goodyear could easily apply into their own service shops and response teams. For example, if a vehicle is brought in by the response team, it could jump the line and be serviced ahead of walk-ins or other services where the team has slack time. This would allow the team to get this vehicle in service much faster than typical shops that are a first-come first-serve basis. The teams could also call their full service shop and let them set up ahead of time in order to get the vehicle fixed in a faster manner. For example, if a van will need brake pads replaced, the response team could call their service center and let them know so they could prime a station and have the brake pads ready upon arrival.

Implementation and Research

The most important aspect of an emergency response team is their ability to arrive at and fix issues in a timely manner. While there are many similarities between the medical teams and service teams, Goodyear cannot simply station themselves exactly like firehouses. This is due to two main reasons: capabilities and severity. Something that ambulance teams are capable of that these service teams aren't is using lights and sirens. These allow the medical team to arrive through traffic much faster than any civilian car could. This means that these teams do not have to account for traffic and speed limits in their arrival time nearly as much as Goodyear would.

However, these capabilities are needed due to the severity paramedics deal with. They need to be able to get to a scene as soon as possible because arriving seconds later could be a matter of life or death. This is something that Goodyear cannot match in terms of importance. If they take a long time to arrive on scene, it is a matter of an additional cost for the delivery company and not life or limb. As such, these service centers do not need to be as densely populated on the map as fire houses/ ambulance centers do. Thirty minutes is fast for the arrival of a team to fix a vehicle; it is not for a medical team. With a time threshold of thirty minutes in mind, it is next imperative to see how far away service centers can be stationed and still arrive within ten minutes.

Given that the average speed limit is 25 mph on residential roads, a team could travel 12.5 miles in thirty minutes (FHWA n.d.). However, this does not account for the amount of time it takes a team to load into the vehicle and hit the road or stoppages like traffic and red lights. If about twenty percent of the time is at a standstill due to loading up and stoppages, this would leave 24 minutes of constant motion or a ten-mile radius. Now there will be some variance due to changes in speed limits and frequency of stoppages; however, this analysis is

theoretical and best used to give Goodyear a rough idea of how many emergency teams they would need in one small area (Northeast Ohio).

Many other factors would come into play that cannot currently be accounted for by this project and would require further research by a Goodyear team like the cost and availability of land in areas where a potential team could be stationed, what specific roads exist in a prospective area, etc. With a radius of ten miles, Goodyear could cover 314 square miles per emergency team while meeting the 30 minute response. With Northeast Ohio being roughly 8,500 square miles, Goodyear would need at least 27 service response teams. However, due to possible overlaps and limited areas due to bodies of water, we would recommend thirty service response teams. During the downtimes for these teams, they could be doing simple services at their center which would not require large capital investments. Repairs like tire changes and oil changes do not require expensive machinery and would allow for the teams to be able to work while waiting on a call.

While expanding the emergency teams, Goodyear should also expand the number of full service centers. Goodyear could hub its emergency teams out of full service centers in areas where they already have service centers, saving the cost of purchasing new buildings. They also would want to expand their full service centers in areas where they do not have one along the map (example: the Trumbull/Ashtabula/Middleburg area is very sparse comparatively speaking).

When deciding where to put a new full service center, they should use a weighted average like the one that is taught in Dr. Gehani's class. To use a local example, assume Goodyear needed a service center to service Amazon's new center in Rolling Acres and the Amazon store right by campus on Exchange St. With Rolling Acres being much larger and

having many more vehicles arriving and departing on behalf of Amazon, it should carry a heavier weight.

We will assign it a seventy percent weight and the Exchange St. will receive a thirty percent weight. To find the new location, you will add $.7 (41.0488, -81.5839) + .3 (41.0716, -81.5097)$ to get new coordinates of $(41.0056, -81.5616)$ (Gehani 2018). This is located in the 3600 block of Highspire Drive. Goodyear should get as close to this location as possible in order to be positioned best to suit the needs of both Amazon centers. Goodyear could use this formula when estimating where to put their new centers based upon the numbers of deliveries in an area. For example, if there are more deliveries in Ashtabula than Trumbull or Middleburg, they should locate a new center closer to Ashtabula.

The possible implementation costs associated with this project can vary wildly depending on how Goodyear decides to incorporate it. The cost per team unit could be very low if they decide to repurpose current employees into members of this team. Likewise, depending on the number of members per team, hiring a whole new team could be very costly. The average cost should be between \$120,000-\$200,000 for each team. There would be costs for a service van and tow truck. These could total out to roughly \$40,000 combined depending on how much Goodyear would like to spend on the vehicles and if they purchase them new or used.

The other cost would be the pay for workers. The minimum number for each team would be two (a van driver and tow truck driver who also can diagnose and fix the vehicle) and the realistic maximum would be 4 people. Any more would face the problem of being severely overstaffed for the amount of work flowing in. The average mechanic salary is about \$40,000 (ZipRecruiter 2020). This would make the total costs add up to the aforementioned costs.

However, these costs are not sunk if this does not pan out exactly as planned. These hired mechanics could still work on regular vehicles that come in for service in their downtime. Furthermore, they could expand their speedy service model to consumers who would be willing to pay a premium in order to get their vehicles fixed in a more timely fashion. Even if the service didn't get the contracts they expected, they should still be able to recoup many of the associated costs and not incur severe losses.

As stated previously, Amazon will be a prime candidate to offer these services to. The company continues to grow significantly each year due to four main factors; its breadth of customers, international expansion, third-party sellers, and innovation. Innovation, however, is the key here. It is something that is unmatched by competing companies no matter how much time and money they invest.

One of the biggest concepts Amazon has introduced is Business Prime. Business Prime deals with Business to Business transactions and offers the same two-day shipping benefits for enterprise customers as the Amazon Prime membership offers for regular consumers. Enterprise customers are the larger, more complex business customers that typically manage hundreds or even thousands of employees. With Business Prime, businesses can now purchase goods in bulk for employees, enabling fast shipping for company needs. Innovative solutions such as this provides Goodyear with reasons why teaming up with Amazon would provide countless opportunities to grow and expand their company. Jumping into the business of last-mile delivery and providing business-to-business solutions to problems that are associated with last-mile delivery is almost a no-brainer.

Amazon delivery drivers are the main driving forces behind last mile delivery. Every single driver is an important asset to the team because of the significant responsibilities they have every day of their job. To gain further insight and knowledge into what a day of an Amazon delivery driver looks like and the problems they face, we interviewed a former Amazon delivery driver (Exhibit 1). This individual worked at the distribution center located in Akron, Ohio.

A normal day for him consisted of first arriving at the distribution center in the morning, picking up the van, and inspecting it for any issues. Then, he would gather all the packages and sort them in the van in the proper manner allowing him to make the most efficient deliveries possible. After that, he logged onto the computer system to see the route he would take for the day. Once all the deliveries were completed, he would head back to the distribution center to drop off the van and clock out.

Normal working hours for an Amazon delivery driver was from 6 A.M. until 4:30 P.M. On an average day, there are anywhere from 150 to 170 stops with about 250 packages. Being out on the road for this long and with these many stops is going to increase the chances of a van breaking down or needing service repair. Every day, each van tacks on about 50 to 60 miles from their delivery routes. This will start to add up in no time, and with more miles on a van means more susceptibility for that van to break down.

The specific distribution center where our interviewee worked at was a relatively new location. They have only been open for about a year, meaning all the vehicles were next to brand new. Brand new vehicles are naturally going to have a lower chance of having problems. For Amazon's distribution centers such as ones like this, no more than one or two emergency teams should be assigned there. Vehicle breakdowns are not going to be as common as they would be

with distribution centers that are, for example, five years or older. In addition to that, vehicles are inspected every morning before being used to make sure everything is in check. Of course, it is possible that a delivery driver might forget to check something that can cause delays later in the delivery route, but that is unlikely since performing daily inspections is part of their job.

Amazon has a vehicle protocol in place that when a vehicle breaks down they will send a new van out immediately. Delivering packages for Amazon is a very time sensitive job because of the services they offer including now same-day delivery so it is of utmost importance that these packages will be delivered on time. Twenty deliveries per hour was considered a regular pace that delivery drivers should try to complete. Making deliveries under these time constraints are already hard enough with traffic, high-rise apartment complexes, and other potential delays that vehicles needing serviced mid-route are unacceptable.

This is where Goodyear would come in. Having emergency response teams ready to come out and service vehicles at any time would be a huge benefit to Amazon. Amazon would not have to worry about sending an available driver out to the van to replace it with a new van every time one breaks down. A Goodyear mechanic would be sent out to the van with the problem and will fix it as fast as possible. For Amazon, having this option allows them to free up costs as well as increase revenue. They will no longer have to have extra drivers available to drive out and replace a van. This will decrease the amount of salary they pay out. Also, if deliveries are being made when they are supposed to, customers will be happy and continue to use the service.

There is always the possibility that the vehicle is not able to be fixed and will require deeper work done to it to get it back onto the road. This could include problems such as engine

failure or alternator failure. If this is the case, an Amazon delivery driver will have to come out, pick up the packages, and finish the delivery.

This, however, can be done by delivery drivers that are already in the area. That way, the distribution center will not have to send an employee out with a new van. Most of the time though repairs of that caliber are not needed, and small issues such as a dead battery or flat tire can be quickly attended to by Goodyear employees. Having service centers in the relative vicinity of Amazon stores/distribution centers is essential to fast response times. These service centers would encompass most if not all of the delivery routes that a certain Amazon facility would have to make. It would serve no good having a Goodyear service center with emergency teams ready to be in a location that is nowhere near an Amazon store/distribution center.

Solution #2: Insurance

Overview

While maintaining a focus on speed within last mile delivery, there is another path that Goodyear may be able to take. Rather than being totally invested into last mile delivery, Goodyear can instead look into providing insurance for companies that decide to embark in last mile delivery, or for companies that are currently dealing with a normal supply chain. Supply chain activities and last mile delivery activities are very similar in that they both generally involve highway transportation to some extent. While last mile delivery focuses on getting products directly into the hands of a consumer, supply chain activities account for the entire process and do not have to be contained to the individual last mile process.

This option offers the flexibility that Goodyear can switch back and forth between the companies and industries that they operate in, focusing on last mile delivery or supply chain

insurance activities for each respective industry. This also can be seen as a potentially safer option for Goodyear since not many companies are focusing only on last mile delivery. There is also the potential for certain companies to eventually shift from normal supply chain activities to working directly with the consumer in last mile delivery activities as the industry will eventually grow.

Speed is of utmost importance as has been discussed in this paper at least in terms of last mile delivery. When companies like Amazon are processing and promising orders to be shipped within two days with their prime delivery service, having the necessary equipment and staff make sure that the product makes it there on time can be costly already. This is especially costly if a vehicle were to break down on an important route. Last mile routes tend to be important routes because they can have the most expensive failure costs in what are called external failure costs.

External failure costs are often the most expensive because the company's image and brand can be damaged. The customer also directly notices these mistakes as they are involved in the process. A package that has to arrive a day or two later than promised is directly known by the customer. Using preventative or appraisal measures in order to keep these potential failures within the company so that no customer gets to see these mishaps is the least expensive option. A very good appraisal option is to use insurance which can be offered to these companies to make sure that they do not have to face as many external failure costs which result from a lack of speed.

Implementation and Research

Providing insurance to last mile delivery and supply chain companies is a way to reduce the total costs of operations for those companies. Goodyear can implement an insurance policy that reacts in similar fashion to the previously suggested emergency response team in order to improve the overall speed of the operations.

This leads into what the insurance could actually provide that would improve the speed of operations. Insurance can range from a number of coverages including but not limited to; cost of freight, replacement trucking / shipping, roadside repair, and routine maintenance.

The cost of freight insurance opportunity would cover the amount of material that is in transport for important goods. This is required for some goods as seen in a response from Exhibit 2 - Confidential Interview. In Exhibit 2, the interviewee is a procurement analyst for a large consumer packaged goods company. They report that “we require our 3rd party logistics companies to carry insurance to cover the goods in transit.” (Confidential, Personal Interview, April 18 2020).

This presents an opportunity for Goodyear. Goodyear can try to find a way, whether it be through the company itself or the 3rd party logistics company to enter into contractual agreements and provide for a portion of the coverage fee. This coverage fee could be a per transit payment that would allocate for the risk of potential damage or destruction to the goods in transit. This interviewee reports that the cost of goods can exceed over \$1 million which for a one time payment could be detrimental for a company not prepared. Goodyear in this instance would be prepared if they were to offer their own insurance by using data analytics to figure out the best possible solution to the amount that they need to charge comparative to the amount of risk they are willing to take.

If the amount is too much, then it could also be possible to cover a portion of the goods. A portion of the goods would be better off covered and provided for rather than no goods because the complications of not having the capital to finance the lost goods would find its impact on the sad consumer. Goodyear could also try and lump this in with other insurance opportunities that other companies likely would not be able to provide due to Goodyear's mechanical and tire background.

Another insurance opportunity is with replacement trucking and shipping. This relates very closely to emergency response teams with the exception that a new vehicle comes to replace the vehicle in transit. Companies may need to have their vehicle repaired and bring a new vehicle out. Rather than having to find one of their own workers and pay them for overtime, Goodyear can send out one of its employees to the site where the vehicle is broken down and try to quickly load the shipment onto the new vehicle that Goodyear brings out. This will alleviate some of the stress that supply chain or last mile delivery companies may have because they will not have to worry about this process. Companies will also be able to operate more efficiently as they do not have to keep their own vehicles out of service just for the slight chance that a vehicle could no longer perform its route. Goodyear can charge a rate whether it is per route based or for a certain period of time that is based upon the risk factor. Companies will most likely be receptive to the idea since they will not have to worry about overtime cost and warehouse space for its non-operating vehicle.

Roadside repair and maintenance are both very similar in what they can provide and are exactly the same as emergency response teams. This can take the form of both insurance and on a per-treatment basis. The insurance can cover certain packages for example tire replacements

for a certain price whenever needed. To help with this method, Goodyear could use the project Mobi to provide for these tires. In Exhibit 3 there is information about how “when a tire costs \$100 in Mobi, it was \$100 pure” (Ciosanni, Personal Interview, April 2020). This should make it fairly easy to calculate how much to charge for an insurance coverage plan that includes tire coverage and repair.

For example, take the amount of times that tires are predicted to need repair, multiply it by the cost of the tires, and multiply it by the target profit margin to get the cost that it would be to the consumer. However, a per-treatment basis could also be useful for unusual repairs or replacements such as engine replacements. These replacements would be quite expensive and most likely not attract companies from purchasing plans that would involve these. Instead, acknowledge that these certain parts are not likely to break down, but that there would be a standard fee to replace this and offer the possibility of replacement should it ever become needed. Maintenance activities would be the exact same as roadside repair activities, just happening back in that company’s warehouse or wherever the vehicle is stationed.

One of the questions brought up by these insurance methods is where would the company operate. The insurance section could operate in any area that Goodyear has available room. Some suggestions could be opening up or building an insurance department within the Goodyear Headquarters in Akron, Ohio so that there is a central place of organization for the insurance department. As per the store layout for this operation, Goodyear can use existing stores for access to supplies needed for repairs and to save money by not building as many new buildings.

Since this operation could involve the supply chain industry, it may also be a smart idea to position buildings or places where trucks can park nearby major highways or significant risk

areas. These significant risk areas could be defined as where an accident is likely to occur. For example, if there are no reported trucking accidents or delays on I-80, it would make sense to spread out the places of operation further since there is less risk of activity happening in that region. In another example is if I-80 is where frequent trucking accidents or delays occur, then there should be more locations within a shorter distance of each other near that specific I-80 risk area.

Calculating location is also slightly different if taking the supply chain route. Assuming the average speed for highways is around 60 mph (accounting for some traffic), if the target goal is to reach the faulty vehicle within 30 minutes, then Goodyear should have trucking locations within 30 miles of popular highway sites when positioned next to that highway. Assuming that the highway is a straight line for simplicity, Goodyear should position these sites every 60 miles to reach their entire highway coverage area within 30 minutes. These trucking locations could also hold very small amounts of Goodyear inventory in the case that a repair is needed, however the main use for these highway positioned trucking sites is to get a new truck to the location as fast as possible.

Referencing Exhibit 2, the confidential individual reports “for an East Coast route, I estimate the delay is around 3-12 hours. For a cross country route, the delay can be 1-2 days.” when using their 3rd party trucking company (Confidential, Personal Interview, April 18 2020). If Goodyear can get to any vehicle used for transportation by its covered company within 30 minutes and solve the issues quickly, then Goodyear can dramatically decrease the amount of time that is lost through these accidents saving even days for cross-country routes at least for this individual’s organization.

Fulfilling Staffing Needs

As Goodyear prepares to implement last-mile delivery, one issue that may arise is staffing. Lauren Dix, a supply chain and fleet manager for DHL, explained that the hardest part of handling her staff was the lack of it. (Exhibit 4). A lack of drivers can slow down the supply chain when someone is unavailable to work, because it can prove difficult to find a replacement. Like last-mile delivery, the operations at DHL are time sensitive, as the truck drivers range from those that bring mail to the warehouse to be sorted to drivers that deliver, unload, and arrange products for stores. Each task is expected to be accomplished within a certain amount of time for best efficiency, and so delays can affect the entire fleet.

To mitigate this, DHL's own recruitment methods were discussed and expounded on here. Goodyear should continue to utilize social media and online job boards such as Indeed.com to search for drivers and mechanics, as well as attend career fairs. However, rather than focusing on university career fairs, Goodyear should attend local fairs and connect with temp agencies. It would also be pertinent to contact local career service centers, such as the Portage Lakes Career Center, for interns or part time employees interested in trades such as vehicle driving or car maintenance. Employing as many avenues as possible to find workers can satisfy the needs of such a time sensitive process as last-mile delivery.

Closing

As we mentioned throughout the report, the last mile delivery market is a growing market, and a growing market will require many different support offerings. These support offerings can range from delivery vehicle production, delivery vehicle maintenance, manufacturing of hardware and automotive parts for these vehicles, and several others. The last

mile delivery market is a somewhat new market, and a lot of these support systems are not currently in place.

After doing an extensive amount of secondary research and primary research, we think that the above mentioned support systems will provide value to companies currently operating within the market, as well as will provide Goodyear a way to enter into this market. The support system of an emergency response team allows Goodyear to provide a service to delivery companies currently operating in the industry. It provides Goodyear a way to create value by decreasing the downtime of broken down vehicles, which in turn will allow these companies to save money. Goodyear can also create and provide a support system with insurance for these delivery companies. Insurance can provide a stable option for support and insurance for external failures will help save the image and face of a company.

Exhibit List

Exhibit 1

1. What does a normal day look like for you? **Picked up the van, got all the packages and sorted them in the van in a proper manner. Logged onto the computer system which took me through the route for the day. After delivering all the packages I would click done and it routed me back to the distribution center where I would drop back off the van and clock out for the day.**
2. How long would you be out delivering on an average day? **A normal day was 6AM-4:30PM.**
3. How many stops would you have on an average day? **150-170 stops on average with 250 packages**
4. How many miles? **50-60 miles because they give you a certain area to cover**
5. How often did vehicles need assistance? **All vehicles were brand new and they only started a year ago so not often. Every morning I inspected the van to see if everything was in check.**
6. Broken-down vehicle protocol? **If my vehicle was to breakdown I would call the distribution center and they would get a new van to me immediately.**

7. Are deliveries very time restrained? **Yes, I tried to do 20 deliveries per hour.**

8. What are things that may cause delivery delay? **Traffic, apartment complexes that may be difficult to get through. High rise apartments where I may have to go up to the 12th floor.**

9. Are there any vehicles decommissioned? **No, because we were at a new distribution center.**

10. How many drivers? **75 divers per shift, about 150 total**

Exhibit 2 - Confidential Interview

Some of the information in this Exhibit has been removed (marked by black highlighter and with text "removed") for confidentiality.

This first set of questions is to try and understand your background in supply chain.

How big is the company you work for (1,000+ employees; 500-999 employees; 250-499 employees; less than 250)?

1000+ employees (5,000-10,000)

Relatively, how many people work within the supply chain department in your company?

150-200

What background do you have in supply chain (Degrees, experience, amount of companies worked for)?

I've worked for my current company (a large Consumer Package Goods company) for [REDACTED] (since I graduated from undergrad). I have an undergraduate degree in Accounting and a Master's in Supply Chain Management. I have supported the supply chain organization as their procurement analyst for [REDACTED].

How important would you consider your position in the company?

I'd say it's fairly important. I help the supply chain organization with most of their distribution needs, including establishing agreements with 3rd party warehousing and transportation companies.

How much do you know about the supply chain process for your company and industry?

I know a significant amount. Without going into too much detail, we purchase raw materials from across the world. A majority of these materials are sourced domestically, but we also make significant purchases of raw materials in the European Union and China. Supplies coming from overseas typically take several weeks to arrive to the US. These supplies are shipped on container ships transatlantic (if EU) / transpacific (if China). We ship using container ships (as opposed to air cargo) since the raw materials have a low \$ value/weight ratio. Depending on the lead time and weekly usage of a given material, we will maintain additional raw materials at local warehouses near our factories. Additionally, we require our suppliers to carry sufficient safety stock in the event their supply chain is disrupted. Once our goods are produced, there are two ways they enter our distribution network. First, a majority of our finished goods (about 90%) from our [REDACTED] main factories go to a centralized warehouse near these [REDACTED] factories. This warehouse then distributes to a network of (20-30) smaller warehouses (located across the U.S.) that serve wholesalers. These wholesalers then distribute to retail locations (such as Walmart, 7/11, etc.). The finished

goods from our other factory skip the centralized warehouse step and instead go directly to the smaller warehouses for distribution. We do not own any of the smaller warehouses. However, we do own the centralized warehouse. We contract with a 3rd party to manage the centralized warehouse. Our products from both the factories and the centralized warehouse are transported via trucking freight. All of our freight lines are run by 3rd parties that own their own trucks.

How vertically involved is your company in the supply chain? For example, do you produce your own raw materials?

We are not vertically integrated. We take raw materials which we buy from suppliers to manufacture our products. We then hire trucking companies to distribute our products through 3rd parties.

This next section deals more specifically on the transportation component of the supply chain process.

What is the most common method of transportation used in your supply chain?

Trucking freight. We contract with logistics companies across the U.S. for our distribution to 3rd party warehouse locations. Additionally, all products arrive at our manufacturing facilities on the back of trucks.

How often does your company make yourselves responsible for transportation? When you buy/sell products, which Free on Board is most commonly used?

We own the products from once they're manufactured until they arrive at wholesalers' warehouses. Since we contract with logistics companies for transportation, they are contractually liable if product is lost/stolen in transportation. When the product is sitting at the centralized warehouse or the network of smaller warehouses, we also own the product, but the warehouse owner is responsible for security of the product.

On a scale of 1-10 how critical is the transportation component to your supply chain with (1) being not critical at all and (10) being bottleneck critical?

5 out of 10. Transportation is important to our product. The retail value of one load of our finished goods is greater than \$1M. However, given our distribution network, we are able to go weeks without shipping product (from our manufacturing locations) to wholesalers without risk of stockouts at retail. This is in part because wholesalers like to keep a few weeks of inventory in their networks, as well as our centralized warehouse holding weeks of additional inventory.

What is a generic reason as to why you selected your previous answer (examples include general price of cargo, frequency of shipments, importance of the product)?

As stated above, our distribution network is able to go several weeks without shipments from our factories without risk of stockout. That said, each individual shipment has an extremely high retail value.

If highway transportation has any role in your supply chain, how often do the vehicles break down (whether it be in or outside of the warehouse)?

Unfortunately, I don't know the answer to this.

What are the typical delays you experience if a vehicle breaks down?

The logistics companies we contract with usually handle several shipments a day on each route they drive for us. If a truck breaks down, there will typically be another truck able to take the broken down load to its final destination. However, some of our route (particularly cross-country routes) can experience longer delays than routes on the East Coast. For an East Coast route, I estimate the delay is around 3-12 hours. For a cross country route, the delay can be 1-2 days.

Who handles delays and breakdowns (you, your company, or an outsourced company)?

The outsourced company is responsible for the delays and breakdowns. However, in the event the outsourced company is unable to find another driver/truck to complete the route, our company can utilize another supplier to complete the delivery. Needing to switch companies is extremely rare though.

This final section asks questions about your company's thoughts about a new service involving transportation within your supply chain.

Do your deliveries in the supply chain have insurance on them (this does not necessarily mean the vehicle itself, but rather the entire shipment)?

Yes. We require our 3rd party logistics companies to carry insurance to cover the goods in transit. Since we don't own the trucks, I'm unsure if we require any insurance on the trucks themselves.

If you know about per vehicle insurance, does your vehicles' insurance provider provide services like roadside assistance?

I'm unsure, but I think some of our 3rd party logistics providers have roadside assistance.

If you could receive assistance in person within 30 minutes including but not limited to completely loading your shipment onto another trusted company's vehicle, fixing or repairing your vehicle, or routine maintenance within your own warehouses, would you be interested in learning more about such an opportunity?

Yes. Although we don't own the trucks, it may be something we'd require our 3rd party logistics companies to have as a level of service.

What would be the most interesting component to you about this new service?

I'd have to say having fixing/repairing the vehicle in a short matter of time would be the most interesting component.

How likely are you to spread this opportunity to your peers?

I'd definitely let them know that this service existed.

Is there anything that you would like to know more about?

What areas of the country would this service cover? Would it be countrywide (including Alaska and Hawaii), or just certain regions? How would pricing work? Would it be a fixed monthly subscription fee + a given amount per incident?

Exhibit 3: Rodrigo Ciossani of Goodyear - Mobi (Phone Interview)

- Can you just refresh me on the background in Mobi?
 - Father, born roughly a year and a half to two years ago
 - Ran experiments on business model thesis
 - Running currently as an incubation
- How did employees get hired at Mobi? What were the key factors you looked for?
 - Quite simple
 - One technician already in Goodyear, specifically for this
 - Marketing background
 - In charge of social media, search engine ads
- How successful?
 - Pretty successful, Goodyear has become a premium brand
 - An attempt to create value with tier 2 or 3 product / cheaper products. Make process lean and simple
 - Trying to win the easiest way to keep the vehicle going
 - Incubation pretty successful
 - Profitability was lower
 - Higher volume
 - Stopped incubation
- What happened
 - Covid, use more on commerce
 - In the freezer
- You plan on bringing it back?
 - No, very limited resources
- What was your training process? Do you hire anyone with car experience and train them to work, or do you specifically hire someone like a tire specialist
 - Experimental mindset
 - Not fully corporate operation mode
 - Experience with digital marketing
 - Analytics
 - Online transactions purely
 - Candidate had experience with e-commerce in all parts
- How different is this from just normal goodyear operations
 - One type of product / One type of tire in different sizes
 - Five different prices only following rim size
 - Anywhere you go to buy tires, you are going to have a tire product, but then they have the fees and etc
 - Wanted to eliminate the prices that generate a lot of frustration from the extra fees
 - “When a tire costs \$100 in Mobi, it was \$100 pure.”
- How big of an area do they cover in Chicago
 - 8 zip codes under operation

- Calculated mostly by operational constraints
- Van parked by a store in which they held inventory
- Reach of 40 miles
- Rarely served the south areas because it was a sort of small operation
- How many customers did you reach
 - Designing for a certain group
 - Targeting a younger demographic
 - Lower price and income level, think middle class and below
 - “Elderly people actually bought such as retired people or 87 year olds”
 - When you focus on something really simple for young people, you attract elderly people too for simplicity
 - Served 300 vehicles, mostly from the 3rd and 4th month and beyond
 - 45 to 60 days from knowing they need tires to actually getting them
 - “1 vehicle a day and ended with 3.8 vehicles on average”
 - Limit was 4
- How is Mobi’s back end business operated
 - Dedicated website to generate internet traffic
 - Purchased many ads but no influencers
 - Had the theme working with external marketing agency
 - Had the team of 3 / 4 people operating the process and the orders
 - A lot of things were done by hand because the operation was so small
 - DoS system
 - Logistics database where you can look up specific SKU, order, forecasts, inventory, shipping from manufacturing. Same system that feeds Goodyear e-commerce
 - Orders processed would inform guy in the van
 - Using google tools
 - Once an appointment is confirmed or order put, calendar immediately locked
 - Store provided inventory, and van served store
- What is Mobi’s average response time?
 - Consumer had a longer journey
 - Arrive at Mobi, looking for references
 - Decide for Mobi, they go online for a checkout process that doesn’t charge them online, just a quote
 - Shows a calendar and they book an appointment
 - Receive an email to take a picture of a sticker on driver side door for tire information
 - Once received, by the day they come to your address and they perform the job, and you pay the technician
- Whenever a scheduled mobile repair / tire change is made, how do you make sure that you get the job done on time
 - Operating the vans for some time
 - One hour is enough to do a repair / replacement

- Reserved one hour of commuting time around that slot
- No need for tracking because they were being so consistent
- No problems at all
- Had ability to change schedule due to traffic jams etc.
- What organizational systems do you use
 - Tripod
 - Manufacturing forecast
 - Manufacturing output
 - Tire distribution
 - DoS system, works really well but is old
 - Searching for specific SKU was easy
 - Very common seeing one store have one van
 - Organize for set of specific tires to be shipped from one place to another
- Price limit?
 - 1 mil budget
 - Used only about \$350,000 total
 - Only pay was not included in this amount
 - \$50,000 per month

Exhibit 4: Interview With Lauren Dix

- DHL is currently partnered with Goodyear.
- Run a low-planning center. Plan truck load shipments and routes from the main office.
Goodyear drops orders, DHL plans delivery truck load routes, outbound/inbound, raw materials, import/export.
- Lauren deals with corporate customers: no small packages.
- Problems: trailers not ready in time, delays at suppliers, cars getting in the way of departure, shortage of drivers (most prevalent).
- More digitization with use of radios and computer systems in vehicles makes for more efficient communication.
- Communication remains an issue - individuals rely on it too much or too little.
- Shift teams are assembled based on availability and Lauren tries to maximize their strengths.
- Final mile delivery window is very tight: bring supplies inside of the store, create proof of delivery (signed invoice), organize order the way the buyer wants, pick up and scan returns. Customer service heavy work.
- Biggest expenses are equipment, labor, fuel, overhead, tablets, and scanners (for delivery and pickup).
- Drivers can call in or send pictures when there are issues.

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