

2. Company Summary

2.1 Company Description

SCDLS LLC will be established as a limited liability corporation, allowing higher credibility, lower tax rates and little limitation on company ownership. Choosing an LLC will allow equal distribution between all current partners. The current partners are George Hilliard, Lee Sargent, Emily Dance, Preston Stinson, and Hagan Walker; each representing a 20% share of the company. As time progresses and funding is needed, an equal distribution equity stake could be considered.

2.2 Company Location and Facilities

SCDLS plans to request space at the MSU Business Incubator facility. This would be the most cost effective solution as it is subsidized by the university. At this stage of development all of the machining and PCB production and assembly will be outsourced, requiring only in house assembly and packaging. As a result, our space needs are drastically reduced.

2.3 Company Strategy

SCDLS' first goal is to become a limited liability company (LLC). Once this goal is met, SCDLS can begin to reach their target market of municipalities and beta facilities. The target municipality is one in a city with high level pedestrian traffic and high level auto traffic, and large cities and college campuses both have these characteristics. Angel investors will be the main source of initial funding. An angel investor will be the first choice in investors, and a loan will be the backup plan. Once we have acquired the initial funds, we will manufacture several systems and market and sell them to a few municipalities and college campuses of varying sizes. SCDLS will then do a soft launch with the municipalities and campuses so that our product can be used in real crosswalks. We will get feedback from the users and municipalities, and fix what needs to be fixed before the actual full launch of SCDLS. Our goal is to sell at least 10 systems for the soft launch. The money made from the soft launch orders can be used to fix, modify, and market SCDLS better for the final launch and purchase more manufacturing equipment and expand the facilities to make more systems.

Marketing SCDLS will begin before the soft launch and will continue through the final launch stage. There are a few marketing strategies. SCDLS will have product representatives paid on a competitive commission for the systems for sales and maintenance and partnerships with insurance companies. Our product representatives will go into cities and campus and market and sell SCDLS to departments of transportation (DOT) and public safety departments. They will also be the DOT's SCDLS contact for any questions, concerns, and maintenance before, during, and after the installment and use of SCDLS. The product representative will have a marketing plan including the partnerships with insurance companies. SCDLS hopes to work with the insurance companies to lower premiums for cities who use SCDLS as part of their safety and accident prevention plans. SCDLS also will use 30 percent of the operating budget to have a research and development department dedicated to finding new ways to keep the roads safe with new products.

2.4 Startup Costs

2.4.1 Manufacturing

SCDLS aims to keep initial startup costs as low as possible. Our initial costs will primarily be related to preparing for and financing the initial manufacturing run of our product. The costs associated with manufacturing are as follows. To minimize these costs, SCDLS will keep the initial batch small; these numbers are for an initial batch size of 80 devices (enough for 10 crosswalks).

Printed circuit boards (PCBs) and electrical components will cost \$50 per unit, or \$5000 for the entire run. Raw aluminum for the cases will cost \$4000. The cost to machine this into finished cases will be around \$115 per hour for 9 hours, for a total cost of \$1035. Assembly of the completed parts is expected to cost around \$1000; this includes automated PCB assembly and final hand assembly of the device.

The total cost for our initial manufacturing run is therefore expected to be \$11035.

After initial capital gain from the sale of the first production run, SCDLS can invest in processes that are cheaper per-unit than these small scale processes. For example, SCDLS plans to design and produce casting molds. These will enable us to produce device cases at a much smaller unit cost. Molds are expected to cost \$????.

2.4.2 Facilities

SCDLS must rent the office and lab space we will need. The costs for the incubator space discussed above are \$350 per month. In addition, we will need utilities such as Internet, for an additional cost of around \$100 per month. The total first-year cost for building space is \$5400. This initial investment will provide sufficient space for the first year of operation.

2.4.3 Miscellaneous

In addition to the above costs, we are allocating \$500 for legal fees that we may incur. Marketing costs are expected to be small due to our focused approach; \$1000 is allocated.

The total first-year cost is therefore expected to be \$17935.

These expenses will be covered with funding obtained from angel investors. Until such funding can be secured, the owners of the company will provide a total of \$10000 to allow manufacturing to begin.

3. Product Summary

3.1 Product Description

The Smart Crosswalk Dynamic Lighting System (SCLDS) is a crosswalk system made up of eight modules that line a crosswalk. These modules illuminate the interior and exterior of the crosswalk when a pedestrian enters the crosswalk, thus dynamically alerting drivers to the presence of the pedestrian. They also collect vehicle traffic metrics for analysis by the system's owner using a magnetometer to detect vehicles and their speed. Each module consists of a microcontroller, sensors, a battery, a solar panel, wireless modules, and light emitting diodes (LEDs) encased in an aluminum housing. The microcontroller will be programmed to control everything. The sensors are infrared sensors that will detect pedestrians and vehicles. The solar panel will use solar energy to charge the battery that is planned to last a minimum of five years. The Wi-Fi capability will allow the modules to communicate with each other and communicate with the internet server to record traffic metrics. The LEDs will be placed in positions for maximum lighting of the crosswalk and vehicle alerting, and the LEDs will also be bright enough to get the drivers' attention and light the crosswalk. All the components will be housed in an aluminum shell to protect everything inside. The dimensions of the modules are comparable to most crosswalk lighting systems and the exact dimensions are [insert product dimensions]. The system will have a simple surface installation on the pavement and requires little maintenance. This system will reduce the number of collisions between motor vehicles and pedestrians in crosswalks, while also giving municipalities improved information about road usage.

3.2 Customer Needs and Benefits

Around the world, traffic incidents occur daily. Our first product, SCDLS, makes the roadways safer for pedestrians and motorists alike. By implementing our system, not only are the needs of our customers met; but anyone that interacts with our system is blanketed by safety – the largest need of all. SCDLS also implements numerous benefits in addition to assuring safety for anyone that uses the system as intended. SCDLS is the only crosswalk system that automatically lights up, alerting approaching motorists of an active pedestrian in the crosswalk. It is also the only system that uses a proven, eye-catching flash pattern to alert approaching motorists. Each of these features addresses specific customer needs while providing benefits that far surpass any competing product on the market.

3.3 Future Products

SCLDS will enter the road safety market with an initial line of solar powered intelligent crosswalk products for multiple size crosswalks and associated monitoring software, and then survey the market for other opportunities. Currently the team is evaluating increasing the options for intelligent road products including street lights that communicate with the sidewalk such that the street lights make more efficient decisions about managing road traffic. Additional products include overhead lights that interact with sensor to provide lighting when it is desired, but not waste energy when it would be unnecessary. These multiple products can be combined and networked together to create a smart grid of safety products to improve the quality and safety for pedestrians.

3.4 Competitive Comparison

SCDLS differentiates itself from other crosswalk illumination solutions by being the only product available that does not require direct pedestrian interaction while also acting as a smart crosswalk and traffic monitoring system. The majority of crosswalk illumination systems are either always on, push button activated, or require the use of external sensors to activate the system. SCDLS' bundling of the sensing and lighting systems in one package is a unique feature that contributes to SCDLS' ease of installation. The installation process for SCDLS was designed from the ground up to surpass all other products with similar feature sets in terms of ease and installation times. Installing SCDLS in a crosswalk is a simple process consisting of three steps. First, pilot holes are drilled for the hubs and nodes. Second, industrial grade adhesive is applied to the installation sites. Finally, the hubs and nodes are bolted to the road, while also adhering to the road via the adhesive. Systems with fewer features than SCDLS, such as those currently found at Mississippi State, follow a similar installation procedure. All of the systems with features similar to SCDLS have more in depth installation procedures that involve significant modifications to the road. Even after going through the rigorous process of installing these other systems they still do not come close to having the full feature set of SCDLS. SCDLS is unique in its capability to collect and wirelessly transmit detailed daily traffic information for pedestrian and motor vehicle traffic. Standalone automotive traffic monitoring systems must be used to obtain traffic information for a crosswalk using any other lighting system. As an example, the MetroCount 5600 is a popular traffic monitoring system that costs \$1307 and is not designed for permanent installation. Deploying SCDLS eliminates the need for standalone traffic monitoring near crosswalks while also giving the customer all of the features associated with a high end crosswalk lighting system at a reduced cost. The most comparable system is a two-lane crosswalk lighting system produced by LightGuard Systems which costs \$19,885, more than double the cost of SCDLS. Overall, SCDLS contains all of the functionality of the other products on the market in a smaller package, while also adding revolutionary features at a reduced price.