2.   Company Summary

2.1   Company Description

SCDLS, LLC will be established as a limited liability corporation, allowing company credibility, lower tax rates and little limitation on company ownership. Choosing an LLC will allow equal responsibility and financial 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 additional 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

Once SCDLS becomes a limited liability company (LLC), SCDLS can begin to begin to reach our target market of municipalities and other pedestrian 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 systems and market and sell them to a municipalities and college campuses of varying sizes for a soft launch. The soft launch will be the initial 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 try to further tend to the needs of the crosswalk users before the actual full launch of SCDLS. Our goal is to sell systems to 10 users for the soft launch: five municipalities and five college campuses of varying sizes. The money made from the soft launch orders can be used to 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 campuses 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 $4000 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 our startup inventory is therefore expected to be $10035. These costs are summarized in Table 1.

Cost of Initial Inventory	
Electrical components	4,000
Case material	4,000
Case machining costs	1,035
Assembly	1,000
Total	$10,035

Table 1: Cost breakdown of initial manufacturing run

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.

2.4.2 Facilities

SCDLS must rent the office and lab space we will need. The costs for the incubator space discussed in Section 2.2 are $350 per month. In addition, we will need utilites such as Internet, for an additional cost of around $100 per month. The total first-year cost for building space is $5400. Renter's insurance is expected to cost $500. 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 costs, such as fees incurred from incorporation. Marketing costs are expected to be small because we plan to self-market instead of hiring an outside marketing company; $1000 is allocated.

2.4.4   Summary of Funding

These expenses will be covered with funding from angel investors. SCDLS plans to secure funding from at least two investors; SCDLS will seek $20,000 from each investor. To cover any further costs, SCDLS founders are prepared to supply any remaining needed funds. Based on our estimates, these should be quite small.

Our funding sources are summarized in Table 2.

Startup Expenses	
Legal	500
Advertising	1,000
Insurance	500
Rent	5,400
Equipment	4,000
Total Startup Expenses	$11,400
Startup Assets	
Cash Balance on Starting date	15,000
Startup Inventory	10,035
Capital Assets	6,000
Total Current Assets	$31,035
Total Startup Requirements	$42,435
Funding	
Investor 1	20,000
Investor 2	20,000
Founding Members	2,435
Loans	—
Total Investment	$42,435
Left To Finance	—
Loss at Start-up	11,400
Total Capital	31,035
Total Capital and Liabilities	31,035

Table 2: Initial Expenditures

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 are small enough for minimal vechicle interference. 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 multiple 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. These features address 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 of life and safety for pedestrians.

3.4   Competitive Comparison

In order to analyze the crosswalk illumination market we will compare the features provided by SCDLS to systems from LightGuard Systems, Traffic & Parking Control Co. (TAPCO), and the Secure Logic Solar Road Light (SLSRL). The first place SCDLS excels is in its simple installation procedure. Installation of SCDLS occurs as follows. First, pilot holes a drilled in the installation sites. Second, an industrial grade adhesive is applied to the installation sites. Finally, the SCDLS modules are installed by bolting them to the road. The SCDLS installation procedure can be performed quickly and does not require major modifications to the road or sidewalk. All of SCDLS' competitors have more complex or restrictive installation procedures. LightGuard Systems' lighting modules have to be embedded into the road during installation. TAPCO's modules and the SLSRL can be installed on the road, similarly to SCDLS. However, LightGuard Systems' and TAPCO's systems also include system controllers and activation systems that must also be installed. These systems also require power lines to be run to the modules, except for TAPCO's solar modules. SCDLS' installation procedure is superior due to the simplicity of the procedure and minimization of equipment to install.

The second feature to compare is the activation method. SCDLS engages the lighting when it detects a pedestrian entering the crosswalk. The SLSRL simply activates at night. LightGuard Systems' and TAPCO's systems are activated either by the pedestrian pushing a button installed on the sidewalk, via a sensor installed in bollards on the sidewalk, or via a microwave sensor installed above the sidewalk. All of the competitors' systems either require the installation of expensive equipment or do not even activate based on the presence of a pedestrian.

The third feature to compare is the lighting itself. SCDLS uses diffused red green blue LEDs to illuminate the crosswalk. The color of the LEDs can adjusted in software and a blinking pattern can also be assigned. The SLSRL only uses white LEDs that do not blink. LightGuard Systems and TAPCO use high brightness lights that can be seen during the day and can be assigned a blinking pattern. SCDLS' advantage when it comes to lighting is the ability to dynamically change the color and blink pattern of the lights.

The final feature to compare is SCDLS' ability to collect and wireless transmit vehicle and pedestrian traffic data. None of the other products on the market have the capability to collect vehicle or pedestrian traffic data. As well, none of the competitors' systems can wireless communicate with a server to transmit traffic data. Therefore, SCDLS' traffic data collection feature truly differentiates it from its competitors and renders existing traffic monitoring systems obsolete.