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ESF e-Bike Initiative at SUNY College of Environmental Science and Forestry

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**ESF e-Bike Initiative at SUNY College of Environmental Science and
Forestry**

By

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With Honors

May 2017

Approved

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Abstract

Electric Bicycles, or e-Bikes, are legal in 35 of 50 US States, as well as most other countries in Europe, South America, and Asia. New York State has been fighting the legal battle on e-Bikes, with legalization bills on the floor for the past 11 years. As part of my Honors Fellowship, I have been tasked with preparing an e-Bike Initiative pending legalized e-Bikes in NYS. In this paper, I examine the intricacies surrounding the ambiguous legal battle currently raging in NYS, provide insights as to what bike policies have worked well in other countries and US States, and then highlight the importance of e-Bike legalization in terms of the three pillars of sustainability. Some of the top recommendations I provide are based on California's new e-Bike policy, the PeopleforBikes organizations' campaigns for bike safety, and a literature review. Also, attached in the appendix is the business plan and materials for an ESF e-Bike Initiative at ESF which would sell and rent e-Bikes to students to support the ESF Honors Program.

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Acknowledgements

I cannot begin to express my sincere gratitude for my summer internship experience with Bill Shields, the Director of the ESF Honors Program, and Doug Dellmore, an ESF alumni and retired businessman. This research was supported by the ESF Honors Program. In this process, I learned many things. Most importantly, how to work and think independently. Similar to Professor Elodin throwing Kvothe off a cliff in Patrick Rothfuss's "The Name of the Wind", Bill challenged me to fly on my own (without breaking any bones). Starting a business can be a tricky, arduous process. Before this internship, I never had any entrepreneurial experience. Bill offered me guidance when I needed it, encouragement when I lacked it, and smiles when I deserved it.

Introduction

What is an electric bicycle? I would argue that it is much more than a steel frame, a motor, a battery, and wheels. Electric bikes, or e-Bikes, are an expression of the shift our culture must make to mitigate climate change. Like any other sustainable solution, there are skeptics and some drawbacks. However, once most people give them a try, in my experience they revel in this new, exciting form of personal vehicular mobility. E-Bikes have health benefits for us, (Reynolds 1) our communities and cities, and our planet (Cherry, 4). However, our culture has not fully realized the positive externalities of bicycling due to a lack of biking infrastructure – making it not facile to use a bicycle as a substitute for cars for most people. Freedom from fossil fuels, parking restrictions, and the financial stress of having a car is priceless. Yet most e-Bikes can be purchased for as little as \$800, with nicer models ranging around \$1500-\$1800. So why aren't these

miracles on wheels more ubiquitous? In this paper, I will cover the specifics of the issue of e-Bike legalization, recommendations I have for legalizing and properly implementing e-Bikes, and then highlight why this is such an important issue in terms of sustainability, health, and financial impacts.

Methods

During the summer of 2016, I was fortunate enough to be contacted by Bill Shields with an opportunity to work on an e-Bike initiative to support the ESF Honors Program. I quickly read a book on entrepreneurship and got to work. Most of my work was independent- developing business materials, reading books and scientific articles, and researching everything from marketing strategies to bike parts. I also had access to dependable advice from Doug Dellmore, an accomplished entrepreneur. Finally, in the Fall of 2016 I took a “Sustainable Community Planning” class taught by Professors Mark Lichtenstein and Whitney Marshall. In this class I chose to do my final project on e-Bike infrastructure strategies, which helped me in writing my honors thesis. With the finished business plan, I had hopes to get started selling and renting out bikes, but e-Bikes have yet to be legalized in NYS.

Discussion

Legal in 35 States, electric bikes have spurred somewhat of a controversy for lawmakers facing undeniable pressure from groups such as the Sierra Club, Alliance for a Clean Energy Economy, and Paris Climate Agreement to move towards a more sustainable transportation system, while also prioritizing safety and financial feasibility.

Why are they still illegal in places like New York? The NYPD, among others, fears infringement upon traffic flow and safety. This trepidation is predicated on issues occurring in China with e-Bikes impacting traffic conditions and causing deaths. According to a PhD study by the Chinese Academy of Sciences, “In 2004, 589 [Chinese] e-bikers were killed and 5,295 were seriously injured. The corresponding figures increased to 3,107 and 17,303 in 2008, which represented 5.4% of the total traffic fatalities and injuries” (Yao and Wu, 11). The past voting records of the NY House and Senate indicate that this problem is of utmost concern despite both parties expressed support of bike friendly legislation. In the past 11 years, the two legislative bodies have been alternately supporting or voting against e-Bike bills, which according to Kent Sopris of the Malkin and Ross lobbying firm, may show that they are struggling with how to properly introduce e-Bikes to NYS roads (Sopris). However, there are groups such as the NY Bicycling Coalition that have introduced an e-Bike bill that will consider potential safety hazards.

Bill S6408-B will add legislative language defining class 1 electric bikes in NYS and enabling their motor vehicle registration. Class 1 e-bikes are bikes that have top speeds under 20 miles per hour and do not have throttle-controlled motor functions. Rather, Class 1 e-Bikes simply have “pedal assist” capabilities, or a function where the motor will automatically assist the rider when actively pedaling, usually at one of five different levels. Some people feel that having a throttle on e-Bikes make them less safe due to riders recklessly gunning the batteries, but I would argue (based on personal experience and discussions with others) that you gain more control when having access to instant, throttle fed speed for thrusting and turning on a dime to avoid collisions. I also

believe that if a person exhibits reckless driving behaviors, they will achieve risky speeds regardless if access to the electric motor is through a throttle or pedal assist system. This is supported by research on e-Bike collisions in China, where the main causes of collisions were found to be aggressive riding behaviors, lack of a driver's license or knowledge of traffic safety, and general errors or accidents in operating e-Bikes (Lao and Wu, 15). However, studies show that most accidents that do occur involve e-Bikes with throttles (Sopris). I personally think this may be a correlation – research has found that that rider knowledge of traffic safety is critical in avoiding accidents (Lao and Wu, 15). This distinction is important however for passing the bill, as NYPD and people like Thomas O'Mara, a NY Senator, and David Gant, a NY Assembly Representative, have been advocating for and proposing bills with increased restrictions (like only allowing class 1 e-Bikes to be street legal) to increase overall safety on our roadways. This may include a mandatory helmet law for everyone. Senator O'Mara's bill will also allow for municipalities to make their own e-Bike regulations, which will likely appease the NYCPD (Meyer, 1). Forming a compromise and restricting all e-Bike classes but class 1 will likely be necessary.

It is notable that this law will not be easily enforceable, as the throttles themselves are not easily distinguishable from traditional handle-bars without throttles. Paul Winkeller, director of the NY Bicycling Coalition, has also been working on the lobbying effort and has described the NYCPD's claims as silly and meddlesome. Whichever side is right, safety should be of utmost importance. One recommendation I have is to require that throttles be painted bright, neon yellow before they are sold. This would ameliorate the enforcement issue the NYCPD has been voicing, and would also help e-Bikes be

more visible to others at night. The other issue is that there is no way to legislate which e-Bikes can be sold (as in banning those that aren't class 1 e-Bikes) because there is nation-wide legislation enabling their marketing. Thus implying that we must rely on enforcing rules regulating class 1 e-Bikes on our roads.

As far as safety regulations, we can learn from the experience and success of other countries. Finland, Norway, Sweden, the United Kingdom, Israel, and India all have a 250-watt maximum limit. 250-watts is the highest amount of energy draw, or power, that a legal motor can have. Whereas China and the U.S.A (that have legalized e-Bikes) have a 750-watt limit. Most countries have regulations requiring a driver's license or learner's permit to operate an e-Bike. Another interesting policy we can learn from is that in China, e-Bike use is restricted in certain downtown areas of the cities of Guangzhou, Dongguan and Shenzhen. This strategy may be effective for legalizing e-Bikes in NYS, where e-Bikes are only facing legal opposition from the New York City Police Department (Sopris). If we were to legalize e-Bikes everywhere in New York except certain designated areas, perhaps a compromise could be reached. From there, the safety and utility of e-bikes may be demonstrated and best e-bike use and regulation practices may be shared.

California has also demonstrated success with this method, as a 2015 passing bill set up regulations for e-Bike use depending on class, where certain classes' use is allowed or prohibited in designated areas. Alex Logemann, a policy analyst for the People for Bikes Organization, calls this new policy a "model for progressive e-bike legislation in the rest of the country." The strength of this law is that it provides local

municipalities the flexibility to regulate different types of e-bikes based on their local needs, without restricting consumers completely from using the type of e-Bike they prefer. This policy regulates different types of bike paths, which allow either class 1, 2, or 3 e-Bikes and mopeds (see figure 1).

The New York State Energy Research and Development Authority (NYSERDA) has launched a phase one electric bicycle share study, with phase 2 pending e-bike legalization. The study concluded that, “if institutional support, public interest, and financial resources continue to develop, then Upstate New York’s cities could be fertile testing grounds for an electric bicycle share system” (Tario et al., 9). Another finding was that the public’s perception of the safety of e-Bikes is not informed and that cities around the U.S. are realizing that low-powered e-Bikes are very safe (Tario et al., 47). The report also expressed a high degree of confidence in passing an e-Bike bill for NYS soon (Tario et al., 19).

The NY Department of Motor Vehicles (DMV) is also a key player in this ambiguous issue. In 2015, NYSERDA and DMV officials had a phone call to gain a better understanding of the DMV’s position on e-Bikes. The DMV officials represented their Legal Bureau and their Traffic Safety office. During the phone call, the DMV representatives reiterated the current e-Bike legislation. However, they also expressed the DMV’s support for legislation that would clarify e-Bikes as bicycles rather than motor vehicles (Tario, et al. 17). This expression of support may be critical for a passing e-Bike bill. During the North Country Sustainability Conference at Lake Placid, I had the opportunity to speak with NY’s Chief deputy for Transportation, Mr. Eng. He confirmed

that safety and increased amounts of bike lanes is of utmost concern for New York's chief stakeholders and decision makers in this process. This is supported by the NYSERDA e-Bike share feasibility study for NY, which indicates that, "the relationship between road users in the city has often been strained, and the expanding use of electric bicycles has not been spared from the tensions" (Tario et al., 18).

In the book, *Toward Sustainable Communities*, Mark Roseland indicates that, "Experience in Davis, California, Boulder, Colorado, and Eugene, Oregon, suggests that areas where bike facilities, such as secure bike storage, showers and bike maintenance facilities are improved, the number and frequency of bicycling trips dramatically increases" (Roseland, 140). There are also several scientific studies detailing the connection between bike-friendly infrastructure and health benefits for the local community. One study done at the School of Community and Regional Planning at the University of British Columbia evaluated the association between a single index of walkability and health related outcomes such as body mass index, chronic diseases such as type 2 diabetes and cardiovascular disease, and air pollutants. The index they studied incorporated land use mix, street connectivity, net residential density, and retail floor area ratios. The study found that a "5% increase in walkability was associated with a per capita 32.1% increase in time spent in physically active travel, a 0.23-point reduction in body mass index, 6.5% fewer vehicle miles traveled, 5.6% fewer grams of oxides of nitrogen (NOx) emitted, and 5.5% fewer grams of volatile organic compounds (VOC) emitted" (Frank et al., 75). Thus, it is apparent that including things like bike lanes in community planning can create many positive benefits, which are critical in a time where obesity in America is an epidemic.

In the attached ESF e-Bike Initiative business plan, I detail plans for an ESF bike hub that would offer services such as indoor bike storage, bike maintenance and repair equipment, and safety information and programs. Ideally, the hub would be in the basement of Marshall Hall. In discussions with Gary Peden, Director for ESF's Physical Plant and Facilities, Alex Poisson, ESF's Sustainability Coordinator, and Melissa Fierke, ESF's Bike Safety Committee Chair, I have learned that the basement of Illick is being used. Currently, the basement holds a large piece of machinery that could be moved to ESF's Lafayette Road station, which is temporarily filled in terms of space and is in the process of being cleared. Mr. Peden has confirmed that a bike hub in the basement of Marshall is a strong possibility and is willing to work on moving the equipment. In the meantime, Dr. Fierke has enough work on her plate with the Bike Safety Committee on other initiatives.

One of the main focuses of the Bike Safety Committee at SUNY ESF has been to establish bike lanes on Euclid, with a campaign involving laminated signs zip-tied to bikes, petitions, and unsuccessful attempts to get Stephanie Miner, the Syracuse Mayor, to assist in the effort. Speaking from personal experience, Euclid Avenue is not safe. What will it take to get bike lane approval? Will a college student have to die to get recognition that this is an issue? Not only will providing more bike infrastructure facilitate biking and reduce the number of cars on the road, it could also save lives. I cannot recommend this enough. What are other areas doing in terms of bicycling infrastructure?

The Sierra Club, the New York Bicycling Coalition, and the People for Bikes organization are all working to unite and empower cyclists by increasing bike infrastructure through nationwide campaigns, such as the “Green Lane” project focusing on 12 major U.S. Cities. Historically, North American cities have placed their (minimal) bike routes on side streets rather than main streets, forcing a problematic choice between comfort and convenience. Facing this choice, many people may choose to take a car to work/school for time or convenience sake. The Green Lane Project seeks to establish more bike lanes on main streets in the cities of Atlanta, GA, Boston, MA, Denver, CO, Indianapolis, IN, Pittsburgh, PA, Seattle, WA, Austin, TX, Chicago, IL, Memphis, TN, Portland, OR, San Francisco, CA, and Washington, DC. The project has been highly successful, having quadrupled the number of protected bike lanes in the United States between 2011 and 2016, with bike lanes becoming a permanent tool in the toolbox of American street design (People for Bikes, 1). One result from this process is the recommendation to cities to provide traffic cones in front of bike lanes to ensure that car drivers realize that the bike lane is there. One section on their website shows two videos of the same bike lane: one with a cone, the other without a cone. In the video without the cone, cars are partially entering the bike lane continuously as they merge onto the street that the lane is on. But in the video of the bike lane with the cone, no cars enter the bike lane. This is just one more inexpensive step city planners can do to help encourage biking and reduce cyclist stress and potential deaths.

The People for Bikes organization is now focusing on other infrastructure that facilitates biking, like bike hubs and smarter “bikeway network planning”, or streets that are designed primarily or exclusively for bike use that are connected and very accessible

to common areas. This concept helps with planning smart growth of urban areas that make using public transit or biking more convenient and accessible for everyone (Mazmanian and Kraft, 234). This effort manifests in “PlacesForBikes city ratings.” Launching in summer 2017, the program will use a point based system to determine (and encourage) the communities making the most progress on bicycle transportation and recreation. The point system is based on data on infrastructure, public opinion, presence of cyclists, safety, and political organization. Bike hubs, or (usually indoor) storage areas with access to bike repair tools, pumps, cleaning equipment, etc. are especially important for e-Bikes, as they are expensive and are more prone to bike theft. Another reason for indoor bike storage is that the e-Bikes’ lithium ion batteries’ lifetime may be shortened when exposed to cold temperatures for long periods. Having these facilities, as explained earlier, will facilitate e-Bike and regular bike use (Roseland, 140).

My final recommendation for improving bike safety and thus paving the way for more appropriate e-Bike laws is to provide bike safety training sessions to the public, to increase people’s knowledge of traffic laws and safe behaviors, attitudes towards bike safety, and perception of the risk associated with riding bikes. Research has shown these all to be highly important in reducing e-Bike accidents (Yao and Wu, 15). As for how these training sessions would manifest, they would have to take into consideration the needs and capabilities of each specific community. Public workshops are also an option, where an event is advertised and held in a spot where a lot of bike commuting occurs. Education sessions should be held regularly as well to ensure that new cyclists are being reached, as well as for re-enforcement of knowledge and skills. The ESF Bike Safety Committee regularly holds booths at events on campus distributing safety gear, and have

many members that are interested in spreading awareness of proper bike use. One use for the ESF bike hub could be a meeting place for educational sessions. The hub could also have safety fliers readily available and a screen advertising the benefits of bike safety and risks of not applying it.

But why are these groups so actively lobbying for e-Bikes? As I mentioned earlier, e-Bikes are not just a form of transportation, but instruments to advance our culture in terms of the triple bottom line of sustainability. E-Bikes have demonstrated positive health impacts, especially for those unable to ride a regular bike – either from poor health or uphill/long distance riding conditions. Thus e-Bikes may facilitate regular exercise for those who do not regularly bike due to the above reasons. Studies have shown that regular cycling can reduce risk of breast cancer, type two diabetes, and heart disease (State Government of Australia, 1).

A New York Times article recently shared a study done on 20 “sedentary” subjects, where before and after comprehensive health exams were given following a month-long trial period with e-Bikes. Most subjects rode more than the required time (40 minutes per day, 3 days per week) and their heart rates averaged 75% of what they were before the study. As a group, they had a trend towards less body fat, and reported enjoying the e-Bikes tremendously (Reynolds, 2). E-bikes may be best suited for exercise purposes for those who lack the physical capacity or mental aptitude to exercise using standard bicycles. But e-Bikes also allow easier access going up hills or on longer journeys than standard bikes do. The NYSERDA Electric Bicycle Share Feasibility Study

supports this, and has detailed maps of Syracuse, Buffalo, and other cities for how e-bikes can increase the service area for bikers (Tario et al., 44).

From the financial perspective of sustainability, e-Bikes are clear winners as well. The average daily commute on an e-Bike costs 5-8 cents in electricity bills for charging the battery. Over one month, that's only \$1 to \$2. How practical are e-Bikes to use daily though? According to the National Household Travel Survey, half of all trips in the U.S. are less than 3 miles (Flusche, 1). This distance is actually optimal for e-Bike use, whereas in my case my two-mile commute to school is faster via e-Bike than via automobile. When I'm replacing my car trips with e-Bike trips, that means I am putting less wear and tear on my Volvo, which can be expensive to take to the mechanic.

In terms of environmental benefits, e-Bikes offer an ambiguous yet high-potential solution for our current transportation system. Paul Winkeller, the Executive Director of the NY Bicycling Coalition, has indicated that there is a great global need for academic research on this topic. From the environmental perspective of sustainability, e-Bikes produce less emissions than cars do. But the question is, how much? Unless charged from renewable energy sources such as a home solar PV system, or using grid-purchased renewable energy, then greenhouse gas emissions are still being emitted. Depending on the energy generation mix of the local grid where one obtains energy to charge an e-Bike, this can mean for a great diversity of emissions profiles for e-Bikes. E-bikes also have different types of batteries, ranging from lead-acid to lithium ion batteries. Lead acid batteries can pollute the environment during the smelting process of their production and their disposal. Lead pollution can lead to developmental disorders, decreased IQ's, and

premature mortality in those in contact with it. Lithium Ion batteries in contrast contribute smaller amounts of environmental degradation, mostly from the process energy required for their production and the extraction of rare earth metals (Notter et al., 2010). In addition, e-Bikes may have anywhere from a 250-750-watt motor, which creates different energy demands and thus higher or lower amounts of emissions. One Chinese study compared the emissions profile of a bicycle style e-Bike, a scooter style e-Bike, a typical American sedan, a bus, and a bicycle. In China, the energy mix is 75% coal, 15% hydro, 8% gas and 2% nuclear. The study found that e-Bikes emit anywhere from 15.6–31.2 grams of CO² per kilometer, including the associated production emissions. Cars however emit anywhere from 102 to 306 grams of CO² per kilometer, with motorcycles emitting 64-128 grams of CO² per kilometer and buses emitting 24.2–96.8 grams of CO² per kilometer (see Figure 2). In the United States, our grid's electricity mix contains 27.6% natural gas, .3% petroleum, 33.5% coal, 21.2% nuclear, and 16.6% renewables (U.S. E.I.A., 1). Thus, e-Bikes would produce much less emissions here than in China using our grid's electricity for energy. More studies are need on this topic.

Conclusion

In conclusion, e-Bikes are a next generation mode of personal vehicular mobility that symbolizes the shift our culture must make to become more sustainable in terms of finance, human wellbeing, social equity, and environmental stewardship. This transition will take time, and like any other sustainability issue, is not a silver bullet and has its flaws. But, like Paul Winkeller of the NY Bicycling Coalition said, “We’re talking about bikes here, not Vietnam!” The controversy over e-Bikes has been blown out of proportion

and we must now focus on how to integrate these miracles on wheels into society, both safely and sustainably. More research on the environmental impacts of e-Bikes is needed. Finally, advocacy and lobbying for e-Bike legalization in the 15 States who already haven't done so is in dire need and I personally will be part of the effort. The business plan I created for the ESF e-Bike initiative, pending e-Bike legalization in NY, is attached in the appendix.

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

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Appendix

CALIFORNIA ELECTRIC BICYCLE POLICY											
VEHICLE TYPE	VEHICLE	USER					BIKEWAY ACCESS				
		PEDAL OPERATED	MAXIMUM MOTOR-ASSISTED SPEED (MPH)	MINIMUM AGE (YEARS)	DRIVER'S LICENSE	LICENSE PLATE	HELMET	CLASS I BIKE PATH	CLASS II BIKE LANE	CLASS III BIKE ROUTE	CLASS IV PROTECTED LANE
BICYCLE		YES	N/A	N/A	NO	NO	17 AND UNDER	YES	YES	YES	YES
TYPE 1 E-BIKE*		YES	20	N/A	NO	NO	17 AND UNDER	YES	YES	YES	YES
TYPE 2 E-BIKE*		NO	20	N/A	NO	NO	17 AND UNDER	YES	YES	YES	YES
TYPE 3 E-BIKE*		YES	28	16	NO	NO	YES	NO	YES	YES	YES
MOPED		NO	N/A	16	YES	YES	YES	NO	YES	YES	NO

*PENDING AB 680

people for bikes | bpsa | CALIFORNIA'S BICYCLE COALITION

Figure 1. 2015 California e-Bike policy

Emission rates per passenger kilometer of production and use phases of life cycle.^{a,b}

	Energy use (kWh/100 pax-km)	CO ₂ (g/pax-km)	SO ₂ (g/pax-km)	PM (g/pax-km)	CO (g/pax-km)	HC (g/pax-km)	NO _x (g/pax-km)	Pb ^c (mg/pax-km)
Car ^d	47–140	102–306	0.23–0.69	0.09–0.28	3.4–10.1	0.57–1.67	0.44–1.32	18–53
Bus	8.7–26.2	24.2–96.8	0.01–0.04	0.04–0.14	0.08–0.32 ^e	0.008–0.030 ^e	0.14–0.54 ^e	1–4
Motorcycle	21–42	64–128	0.04–0.08	0.20–0.40	6.3–12.5 ^e	1.13–2.25 ^e	0.08–0.15 ^e	16–32
Bicycle	4.88	4.70	0.01	0.06	Unkn	Unkn	Unkn	0
Bicycle style electric bike	3.8–7.6	15.6–31.2	0.07–0.14	0.07–0.14	0.007–0.014 ^e	0.027–0.053 ^e	0.010–0.020 ^e	145–290
Scooter style electric bike	4.9–9.9	20.2–40.5	0.09–0.17	0.10–0.19	0.009–0.017 ^e	0.032–0.064 ^e	0.014–0.027 ^e	210–420

Note: (a) some fields are Unknown (Unkn) because data are not available for the emission of these pollutants from production processes and/or power plant emissions. (b) different vehicles have different impacts on congestion, with cars being the least efficient and buses being the most space efficient forms of mobility. Increasing congestion will yield higher emissions per km. The above emission factors assume generally uncongested city driving cycles.

^a Assuming lifespan of 197 000 km, 1 000 000 km, 20 000 km, 60 000 and 50 000 km for car, bus, bicycle, motorcycle and electric bike, respectively.

^b Ranges indicate assumed average load factors of 1–3 pax for car; 25–75 pax for bus; 1 pax for bicycle; 1–2 pax for motorcycle; and 1–2 pax for electric bike. Notably, multiple passengers on e-bikes are illegal in many cities and energy use requirements are raised, which is not accounted for here.

^c Assuming 100% recycle rate and one battery every 10 000 km for electric bikes and one battery every 3 years or 250 000 km for buses, one battery every 3 years or 75 000 km for car, one battery every 3 years or 18 000 km for motorcycle (Wang et al., 2006).

^d Sullivan et al. (1998)-LCA of Generic US Car (cautiously compare due to different methodology).

^e Only use phase emission rate, no production processes included.

Figure 2. Comparative vehicle emissions in China (Cherry et al., 2009)

ESF e-Bike Initiative

Business Plan

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I. Executive Summary

Tired of those hills? Our electric bikes are a perfect option for anyone looking for an alternative, efficient, and eco-friendly mode of transportation. The ESF Honors Program is prepared to launch an e-Bike Initiative pending NYS e-Bike legalization to advance the usage of electric, pedal assist bicycles on campus and the surrounding areas. The goals are reducing the college's carbon footprint, making money, and adding value to the campus community. This initiative will motivate students, faculty, and others to adopt an environmentally responsible, healthy, more efficient and fun culture for personal vehicular mobility. Under the American Enterprise System, the ESF e-Bike Initiative will rent electric bikes at affordable prices, all the while marketing the cost-saving (Weinert et al., 2007), environmental (Cherry et al., 2009) and health (Reynolds, 2016) benefits of e-Bikes that will add substantial value to the campus community. Those who wish to purchase electric bikes will be directed to our supplier's website. A commission from our supplier will provide the initiative with profit. A recent feasibility study by NYSERDA on e-Bikes in New York State has indicated large market potential (Tario et al., 2016), and ESF aims to jump on this opportunity to become one of the first e-Bike rental services in the Syracuse area. This initiative has a broader goal of being a replicable pilot program, exportable to other campuses throughout the USA and a motivator for other positive environmental movements that have benefits for the local environment and mitigation of harmful climate change causal factors.

We have selected our products after a careful market search for e-Bike models that bring substantial value to the table for the price they are marketed at. Our location, the ESF Bike Central, offers indoor storage space and a host of other services to our customers, like access to repair tools, advice and e-Bike expertise, and programs like monthly e-Bike tours, traffic and e-Bike safety information and training, etc.

The electric bike industry is a young one, with e-Bikes not yet legal to ride in New York State (but legal to sell). More information on the current legal environment can be found below. ESF e-Bike Initiative aims to be a strong competitor in this new field, starting this coming fall of 2016. Our market base- SUNY-ESF, Syracuse University, Onondaga Community College and Le Moyne College, includes over 30,000 students plus the associated staff, faculty, and administrators at each school. SUNY-ESF, our "home base" of operations and the location of the ESF Bike Central, is an environmental school with many sustainable minded students, faculty, staff, and administrators. The initiative will leverage this mindset by marketing the eco-friendly, healthy, and cost-saving nature of e-Bikes.

Creative funding methods and donations for supporting the procurement of e-Bikes and needed facilities, equipment and participation of student “employees” operating the program will be adopted and used as a part of the proprietary model. In the beginning of the program, the primary funding mechanism will be start-up capital provided by honors program donors and then by earnings generated via bike rentals and a possible sales commission from our suppliers after NYS changes the law.

The ESF e-Bike Initiative will seek to employ its university faculty and administrators to lobby and influence the local and state officials to provide constructive legislative assistance, possibly funding and marketing help through State of New York programs that are available to encourage business development in the state. It will further seek to search out, define and promote the receipt of financial assistance from any educational or business development organizations that might be available.

The initiative will seek to identify specific opportunities for additional research and development of concepts that could be performed under the general aegis of positive environmental activity both with respect to further use of electric vehicles in general, cultural changes in personal mobility attitudes, and practices among youth and the expansion of similar programs within the structure of the American Enterprise System.

Mission Statement:

The SUNY-ESF Honors Program is launching an e-Bike initiative to advance the usage of electric, pedal assist bicycles on campus and the surrounding areas. The goals are reducing the college’s carbon footprint, making money, and adding value to the campus community. This initiative will motivate students, faculty, and others to adopt an environmentally responsible, healthy, more efficient and fun culture for personal vehicular mobility. Under the American Enterprise System, the ESF e-Bike Initiative will rent electric bikes at affordable prices, all the while marketing the cost-saving (Weinert et al., 2007), environmental (Cherry et al., 2009) and health (Reynolds, 2016) benefits of e-Bikes that will add substantial value to the campus community.

Company Goals and Objectives:

Goals: Have a strong customer base, with strong customer satisfaction. The ESF e-Bike initiative should spread from campus to campus like a virus, with other honors colleges and programs acting as conduits for spreading awareness and the business model. A long term goal is becoming a replicable pilot program, exportable to other campuses throughout the USA and a motivator for other positive environmental movements.

Objectives: Have a strong turnover rate within the first couple months of operation, and great initial goodwill. People should be coming in and out of the ESF Bike Central like bees in a beehive.

Business Philosophy: Getting e-Bikes on the road is our ultimate objective and to accomplish this, customer satisfaction is a subject the Initiative takes very seriously. It is our goal to make our customer's experience with electric bikes as enjoyable, safe, and worry-free as possible.

To whom will you market your products?

- Students, faculty, and staff of SUNY-ESF, Syracuse University, Le Moyne College, and Onondaga Community College
- Those looking for exercise, but not willing or able to bike up hills or for long distances, as e-Bikes reduce the risk of getting tired and not being able to make the distance back home without assistance.
- Sustainable-minded people
- Mountain bikers
- Bike racers/enthusiasts
- Those looking for a low-cost alternative to a car

While e-Bikes have been extremely popular in Europe and China in the past decade, their use in the U.S. is just beginning to proliferate. California recently passed legislation enabling their use, and the industry has boomed in that area, where the ubiquitous hills make for an ideal e-Bike environment. While the hills found in CA can be a barrier for many traditional cyclists, electric bikes offer a means of overcoming this obstacle, and some electric bikes even have charging capabilities when descending hilly slopes. This demonstrated success can be replicated in Syracuse, which is also host to a great many hills.

Current Legal Environment: The New York DMV treats e-Bikes as motorized vehicles and requires them to be registered as such. However, since the federal definition of electric bicycles exempts them from regulations that would require items like a VIN and motor vehicle safety equipment, there is no way that most types of electric bicycles can actually be registered in New York State. The result of this current impasse between New York State regulation and federal law is a Catch-22 that leaves electric bicycles in a state of legal limbo. In April 2015, a NYSERDA representative spoke with two DMV officials: one representative with the Legal Bureau and one representative with the Traffic Safety Office. During the discussion, the DMV representatives reiterated the

interpretation of electric-assist bicycles as a motor vehicle due to the presence of a motor, regardless of the terms of its pedaling assistance or power output. However, they support legislation that would clarify them as bicycles rather than motor vehicles.

Proposed Legislation: Indeed, there is an electric bicycle bill (#S06408) that passed the Senate on May 19, 2015 and is in front of the Assembly as of June 2015, but has not been acted on as of yet. Such bills have consistently been passed by the Assembly in prior years, but have failed to clear the Senate, which enhances the bill’s chances given that the Senate has already passed it.

See figure 1. below for a map detailing the status of e-Bike legislation by State.

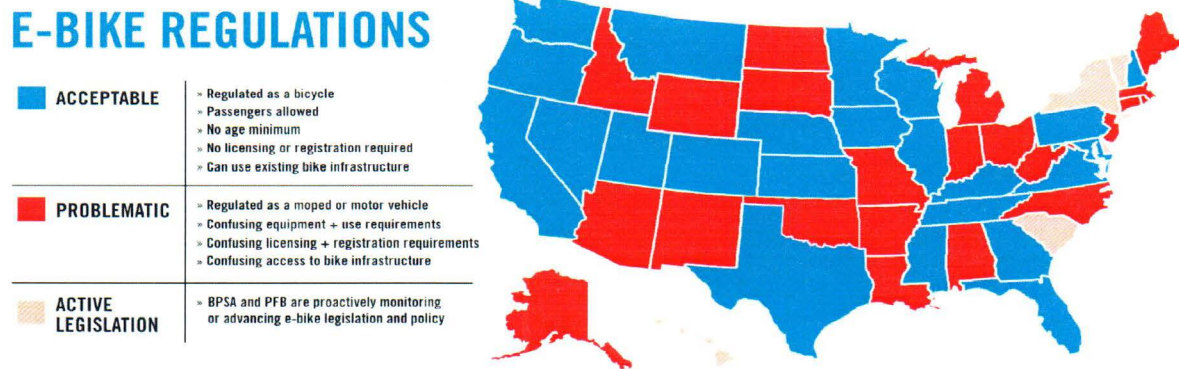


Figure 1. Electric Bike Regulations by State

In the United States, the bike industry estimated that more than 200,000 e-Bikes were sold in 2015 and this number is set to increase by 10% annually. (New York Bicycling Coalition, 2015) The New York Commissioner of Transportation, Mathew Driscoll and the NY Bicycling Coalition remain optimistic for a passing e-Bike bill. The Honors Program will be leading an push to get this legislation passed by asking interested ESF students to send letters and emails to their NYS legislators and the Governor explaining the reasons they would like to use e-Bikes. Hopefully we can help speed the legislative process through this effort.

Company strengths and core competencies:

New York State is on the verge of opening up its roadways to electric bike users, and we aim to establish ourselves as a strong competitor in this new market. Syracuse, New York already has a large bicycle community (see the Onondaga Cycling Club, SU Cycling Club, ESF Bike Safety Committee, and Mello Vello Bike Shop.) SUNY-ESF students, staff, and faculty also are for the most part an environmentally conscious group, and the initiative will capitalize on this mind set and market electric bikes as an eco-friendly, low cost, healthy alternative to traditional means of personal vehicular transportation. We have carefully selected the e-Bike models we intend to rent for the value they bring to the table for the price they are marketed at. At this time we hope to initiate and maintain a relationship with RAD Power Bikes. The ESF Bike Central will offer a number of supplemental goods and services for our customers and will draw in sales for our partners and rentals.

II. Products and Services

Tile™ Tracking System

- Theft and loss prevention
- <https://www.thetileapp.com/how-it-works>
- 12 tiles @ \$15 each
- Will be attached to rental e-Bikes and sold at an additional cost in the ESF Bike Central and ESF College Bookstore.
 - Attached via Tile Clip, found at: http://www.shapeways.com/product/H2UY8JS2K/tile-stealth-bike-tracker?li=gmerchant&utm_source=google&utm_medium=cpc&gclid=CITg-cb_os4CFQcfhgodMNICCA
 - Will be hidden under bike seats, not advertised to the public for safety reasons.

ESF Bike Central

- Indoor storage for e-Bikes.
- Maintenance area with free tools and tips available, and bike parts, helmets, and U-locks for sale.
- Will be an area where people can go to find expertise on e-Bikes- for example which e-Bike model best suits their unique needs.
- Will feature a wall mounted screen for e-Bike video demos, safety videos, and other applications.
- Will assemble e-Bikes for those who have ordered from our suppliers' websites.

- Area where safety information can be passed on to riders through brochures, safety classes, posters, etc.
- Will have a ride calendar board for coordinating biking events- like tours, community rides, mountain biking, etc.
- Located on the SUNY-ESF campus, next to Walters Hall.
-

Our current plan is to use Rad Power Bikes as our major or sole supplier for e-Bikes. Their bikes include:

Rad Mini

- Powerful 750 watt 48 volt power system, provides 15-50 miles of electric traveling
- 60.8 lb's
- Heavy duty front and rear cargo racks
- The low center of gravity makes the bike feel stable when riding and carrying a heavy load
- Comfortable but compact 4'' wide and 20'' tall all-terrain Innova tires soak up bumps and provide a nice smooth ride and exceptional traction during your daily pursuits.
- Can be conveniently folded in order to store and transport the bike more easily (fits in a car trunk & in offices)
- Integrated front and rear lights for increased visibility
- 20 MPH top speed
- Electric motor with 5 levels of pedal assistance or twist throttle
- LCD user interface with battery charge gauge, distance traveled, power consumption, light controls, and speed.
- Includes 2 USB charging ports for power on the go for your portable electronics.
- Powerful 180mm front and 160mm rear disk brakes with automatic power shutoff, stop you easily and shut off power to the motor even if the throttle is accidentally applied.
- With double walled, 100 mm wide, aluminum alloy rims and 11 gauge stainless steel spokes, the RadMini has the strongest wheelset out of any production folding bike.
- The handlebar height can be raised and lowered for a perfect fit. The adjustable stem, deluxe saddle, ergonomic grips, and premium aluminum folding pedals make for a solid and comfortable connection with the bike.
- Battery pack can be easily removed from the secure mount with the included key set.

Rad Wagon

- 750 watt 48 volt power system
 - 75 lb's
 - Size is not too big and not too small so you get all the benefit of a cargo bike without the challenges associated with larger and heavier options.
 - The RadWagon has a massive 350 pound cargo capacity including rider and a flexible rear deck for carrying all types of loads.
 - The low center of gravity makes the bike feel stable when riding and carrying a heavy load
 - Compatible with a full range of off-the-shelf cargo bike accessories including bags, seats, and extra handlebars.
 - Large 2.3'' wide all-terrain Kenda tires can handle heavy loads and varying riding conditions, with exceptional traction.
 - 30 mm wide rims and 12 gauge stainless steel spokes means the Rad Wagon has one of the strongest wheelsets out of any production cargo bike.
 - Battery pack can be easily removed from the secure mount with the included key set.
 - 50 watt power system allows you to carry heavy loads and travel with confidence whatever your trip and full 21 Speed Shimano Drivetrain allows for easy pedaling at low and high speeds. The 5 level pedal assist and throttle on demand allows for complete freedom and customization for operating the RadWagon.
 - Full coverage fenders wrap the front and rear tires and protective wheel skirts keep hands and feet out of harm's way.
 - The deluxe ergonomic velo plush saddle provides comfortable seating for long days in the saddle.
 - Ergonomic grips, and premium aluminum pedals make for a solid and comfortable connection with the bike.
 - Twist throttle for full power on demand or any one of the 5 levels of pedal assistance for a more natural riding experience.
 - Powerful 180 MM front and rear disk brakes with automatic power shutoff, stop you easily and shut off the motor even if the throttle is accidentally applied.
 - Included headlight runs directly from the battery pack and can be controlled with the remote toggle. The included tail light rounds out a robust lighting package for increased visibility and safety in day light and nighttime riding conditions.
 - The vibrant orange color catches the eye of drivers.
-

- Reflectors built into the pedals and wheels provide additional front/back/side visibility.

Rad Rover

- 750 watt 48 volt 11.6 Ah power system, good compared to more common 36 volt e-Bikes
 - At only 7 pounds this is one of the lightest and most energy dense battery packs ever supplied on an electric bike.
 - 60.8 lb's
 - Rear wheel mounted hub motor increases traction when starting on hills and provides greater stability compared to front hub motors
 - An internal planetary gear provides ample starting torque and a high top speed while keeping the weight of the bike low for floating over snow and sand. Geared hub motors have internal gears which allow the high speed and high efficiency motor inside to match the speed of the low speed 26"/660mm wheels.
 - Geared hub motors typically weigh around 50% less than a direct drive hub motor with similar performance.
 - The motor also includes an internal freewheel which means when the motor is off and you are just pedaling the resistance is greatly reduced and it feels more like pedaling a regular bike.
 - 7 speed Shimano drive train lets you match your peddling speed, terrain, and motor speed, so you are always in the perfect gear.
 - A lightweight 6061 aluminum frame balances style, efficiency, and comfort into a bike that is exceptionally durable but feels nimble and quick under your feet.
 - Suspension fork for added comfort
 - Includes a preload adjustment knob to tune the forks for your weight and riding style.
 - The fork also has a handy lockout knob which allows you to go from active front suspension to rigid with the flip of the knob. Lockout is commonly used by off road cyclists when they are riding on the road to increase pedaling efficiency.
 - 26"x4" / 660.4mmx10.16cm Kenda Juggernaut Fat Bike Tires
 - Grip the road for fast turns, trails, and snow
 - Leather ergonomic grips and a matching comfort saddle with alloy rails.
 - Front and rear Tektro disk brakes provide you with strong stopping power in mud, sleet, and sand.
 - Both brake levers automatically cut-off the motor power when they are applied for added safety.
 - LCD user interface with battery charge gauge, distance traveled, power consumption, light controls, and speed.
-

- The LCD readout displays an error code when a component is at fault allowing you to pinpoint the problem right away!

What are the pricing, fee, or leasing structures of your products or services?

The ESF e-Bike Initiative will utilize conventional and unique marketing methods and sales strategies (unique methods becoming a proprietary asset of the ESF e-Bike Initiative and part of its exportable model objective). Rentals will be made available to the campus community as follows:

Rent

1. Pick an e-Bike to rent. We try to have every e-Bike we sell available for multi day renting, but it is best to check with us ahead of time (via a rental request on our website, www.esf.edu/bicycle) to make sure.
 2. Request a rental (preferably ahead of time, as far in advance as possible) by filling out the ESF e-Bike Initiative rental & liability forms. Please note: we are often not able to rent bikes on weekends with short notice due to anticipated high demand.
 3. Rental pass types*:
 - a. \$__ day pass (12 hour)
 - b. \$__ day pass (24 hour)
 - c. \$__ weekend pass (Friday-Sunday)
 - d. \$__ week pass (Mon-Friday)
2. To protect against damage and theft, we will need to authorize a credit or debit card when the rental is occurring.
 3. We will utilize a Tile[™] Bluetooth tracking system to prevent loss and theft of rental e-Bikes.

*these prices are not set in stone and are subject to change at any time based on our learning experience as well as the manner of our procurement of electric bikes. Obtaining a stronger commission from our e-Bike supplier(s) would enable lower, more affordable prices for college students- resulting in more bikes rented and purchased, ultimately bringing more cars off the road.

ESF e-Bike Initiative Semester Voucher

1. Customers may also rent e-Bikes on an ongoing basis throughout the first & second semester of the SU & SUNY ESF academic calendar. The first voucher grants full access* August 26-January 16. The second voucher grants full access* from January 17- August 25. Summer passes are also available from May 1- August 25.
2. Vouchers are \$ ___ per semester/summer
 - a. We are awaiting results from a future marketing survey to set a price here.
3. The voucher also renders access the ESF bike library, and all the services the ESF Bike Central offers (See attached ESF Bike Central Document)
4. To protect against damage and theft, we will need to authorize a credit or debit card for \$300 for the full semester voucher period.
5. Request a rental (preferably ahead of time, as far in advance as possible) by filling out the ESF e-Bike Initiative rental & liability forms. Please note: we are often not able to rent e-Bikes on weekends with short notice due to anticipated high demand.

*as available, please call or register on our website www.esf.edu/bicycle ahead of time. (This website is pending e-Bike legalization in NYS)

Purchase

Those looking to purchase an electric bike will be directed to our supplier's website. A wall-mounted TV screen in the ESF Bike Central be used for those looking to purchase an e-Bike, enabling their research on which e-bike is best for their own use. Videos and websites- from our suppliers' websites, <https://electricbikereview.com/> , and other sources will be displayed here. The Initiative aims to earn profit from this in the form of a sales commission from our suppliers. Our website will feature a link to our suppliers' websites for ordering electric bikes of their own. The use of this link will be the verification for our sales commission.

III. Marketing Plan

Economics

Facts about your industry:

What is the total size of your market? Approximately 2,250 ESF students, 15,224 Syracuse students, 11,783 Onondaga Community College students and 3,319 Lemoyne

students plus associated faculty, staff, and administrators for these institutions. The Onondaga Cycling Club has 419 active members and the SUNY ESF Cycling connection and Syracuse University Cycling Club is less represented in numbers but not lacking in spirit and shared interests.

- What percent share of the market will you have? (This is important only if you think you will be a major factor in the market.) 75% - this is a best guess, as there are few local e-Bike dealers closer than New York City but there very well may be some in development. Also, online retailers and local bike shops are a constant competitor.
- Currently in the process of a market survey via emails to campus groups- students, staff, faculty, etc.
- Current demand in target market: There is no current demand, as there is no current market. This isn't technically true as electric bikes are legal to sell, but the amount of people looking to buy them is minimal due to the inability to legally ride them.

Growth potential and opportunity for a business of your size: There is potential for growth, especially with favorable legislation. Marshall Street, a hub for restaurants and businesses, is a centrally located area in Syracuse where many people come through day-to-day. Expanding there may yield more sales volume with increased exposure to potential customers. In a NYSERDA feasibility study for electric bikes in Syracuse, New York, it was indicated that Marshall St. would be suitable for an electric bike initiative such as the ESF e-Bike Initiative. (Tario et al., 2016) This is because Marshall St. is a “hub of commercial, residential, student activity occurring relatively close together” and would yield a large service area for electric bike users, shown below.

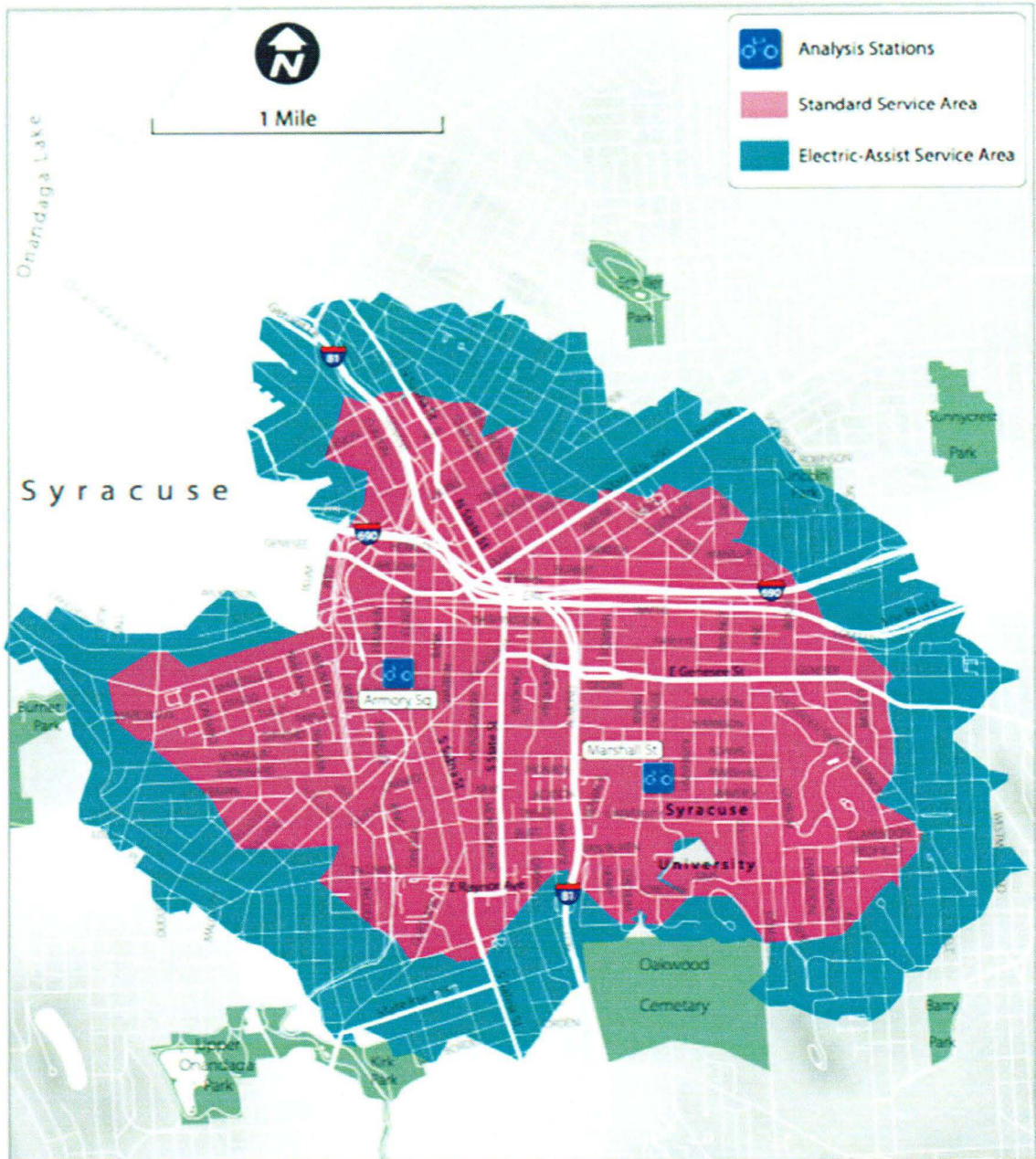


Figure 2. NYSERDA e-Bike Service Area Analysis- Syracuse

Barriers to entry:

- Training and skills- Those who do not have their driver's license need to be trained in traffic laws (the ESF Bike Central will likely hold

educational programs and distribute safety information, via pamphlets, posters, and our website.

- Unique technology and patents- e-Bikes are still illegal to ride in NYS
- Weather- The success of an e-Bike business, even one renting bikes such as the RAD ROVER which fare well in the snow, may ride on the timing of the onset of winter and the turn of spring. In Syracuse NY, a city with record snowfall and harsh winters, an early or especially harsh winter may reduce our market potential. (Tario et al, 2015)

Overcoming these barriers:

- The initiative will market e-Bikes as a cool, healthy, sustainable, cost-saving alternative to conventional bikes and cars.
- The initiative will leverage College Orientation Leaders' ability to influence new students during orientation week with an e-Bike tour of the Syracuse area (prominent restaurants, cafes, libraries, theatres, parks, other places of interest)
 - Laura Crandall, ESF's Director of Student Involvement and Leadership, is very open to this idea for Fall of 2017.
 - In the meantime, during Orientation Week at ESF, SU, Le Moyne, and OCC e-Bikes will be ridden around campus and displayed to incoming students, socially marketing our initiative.
- Take a monthly ESF Sponsored e-Bike tour of an applicable area in Syracuse, for example Green Lakes State Park (10 Miles from ESF). This event and others like it will be sponsored by the ESF Bike Central and advertised to the campus community via flyers, social media, and emails.
- Market e-Bikes simply by having ESF, SU, Le Moyne, and OCC Students ride them on and off campus.
- Offer traffic law training at the ESF Bike Central.

How could the following affect your company?

- Change in technology- Increase rentals with marginal increase in consumer surplus due to the added benefits of the new technology.
- Change in government regulations- This is a current goal for the ESF e-Bike Initiative, as legal e-Bike operation in NYS would increase demand for our products and services.
- Change in the economy- Since e-Bikes have demonstrated cost-saving benefits, (Weinert et al., 2007) this theoretically would increase our appeal, rentals, and suppliers' sales if the pitch is marketed correctly.

- Electric bikes make any sort of errand easy and quick. Take your child to school. Pick up groceries. Optional rack bags or a bike trailer provide all the carrying power you need.
- According to the 2009 National Household Travel Survey, [half of all trips in the US are less than 3 miles](#). Biking makes good sense!
- Effectively flatten out hills with the help of the electric motor – just another one of the many benefits of electric bicycles!
- If your significant other loves to cycle, but you find it hard to keep up, an electric bike helps you spend more quality time together.

Financial

- Save money on gas
- If you have a car, you will put less wear and tear on it by driving it less in favor of cycling.

What after-sale services will you give? Some examples are delivery, warranty, service contracts, support, follow-up, and refund policy.

- Proprietary unique marketing method
- Tiletm tracking service
- Bike Central
 - Access to bike repair tools & experts, safe indoor storage, & sustainably-powered charging station
 - E-Bike oriented programs such as e-Bike tours, safety classes, etc.
 - Hub for cyclists and other means of sustainable transportation, such as the ESF Bike-share program, skateboarders via skateboard racks, and (possible) bus route

Customers

Demographic profile:

- Age- Old enough to ride a bike and understand traffic laws (16?)
 - Gender- any
 - Location- SUNY ESF, SU, OCC, Le Moyne, and surrounding vicinity
 - Income level- Any (this program is designed to save customers money)
 - Social class and occupation- Primarily students, staff, and professors but we don't discriminate.
 - Education- Any, but those at ESF may understand & appreciate the benefits of electric bike use to a greater extent.
 - Other (specific to your industry)- Those without athletic or health requirements to ride standard bikes (up hills) or without licenses to drive cars are also a target market.
-

Competition

What products and companies will compete with you?

- Skateboards and standard bikes (e.g., Mello Vello bike shop on Westcott St., which is several blocks from the University area)
- Cars, motorcycles, and mopeds
- Other Electric Bikes (too numerous to mention them all and new models are appearing every year)
 - E-JOE EPIK SE
 - 350 watt brushless geared hub motor
 - 7 speed transmission (Shimano Tourney TX-55)
 - 3 level pedal assist, thumb throttle control
 - Tektro front disk/rear breaks 160 mm
 - 42 lbs
 - LED Display
 - 20-30 mile range
 - Comes in multiple colors
 - Volt Urban folding e-Bike
 - Very competitive price- only \$1,249 putting it at a better value than most electric bikes for consumers looking to save money.
 - 5 speed electric assist with thumb throttle control
 - LCD smart display
 - 15-25 mile range
 - 6 speed Shimano gears
 - Rear hub 350 watt motor
 - Tektro front disk/rear breaks 160 mm
 - 20.0 mph top speed
 - Only comes in black and white
 - 45.0 pounds (with battery)
- We have a relatively new product in a market that hasn't even legally opened up in New York State. This means that there aren't any legitimate competitor's right now, but there very much could be others in the same position working to get a foothold in the market as resellers or renters when the law is passed.

Will you have important indirect competitors?

- Amazon, other online retailers

How will your products or services compare with the competition?

- ESF e-Bike Initiative offers a trial period for determining which our e-Bike models is ideal for the customer's specific purposes via our rental service.
- We have a physical location that is convenient and in view of potential customers.
 - Word of our electric bikes will spread around better with a local physical location and e-Bikes coming in and out daily.
 - The ESF SU Bike Central will be able to service e-Bikes and provide safety and best use information, tours and other activities, and tips for where to take the bikes.
 - Offers an indoor storage area for the bikes, whereas those who buy online will not have access to indoor storage local to their campus or workplace.
 - Our staff will assemble the e-Bikes for customers upon request.

Competitive advantages and disadvantages

Our unique location, SUNY-ESF, is a small environmental school located next to three other medium to large sized universities. This allows for a strong consumer base of sustainable-minded people who will surely appreciate the eco-friendly and cost-saving benefits of electric bikes. The ESF Bike Central offers a variety of services for our target market, and our unique and proprietary marketing method will increase our market potential.

Our two main competitive disadvantages are that e-Bikes are not yet legal to ride in New York State, and the fact that Syracuse winters will likely discourage large amounts of e-bike adoption and use during the months of November to April, weather depending. Many types of e-Bikes have fat-track tires, and the ESF Bike Central to provide indoor storage to hedge against this disadvantage.

Niche

ESF e-Bike Initiative is fortunate to be located in Syracuse for many reasons. The hills allow for a modicum of electric generation while riding, and the bike community is strong, with an SU Bike Club and ESF Bike Share program already running. The Onondaga Cycling Club has 419 active members. SUNY-ESF is an Environmental School, meaning students, faculty, and staff will be open to appreciating and embracing the sustainability of Electric Bikes. The ESF e-Bike initiative will have relatively little immediate competitors at least in the beginning, before folks notice the potential of e-Bikes when they become legal in New York State, and more local retailers join the market.

Strategy

ESF, SU, Le Moyne, and OCC students will be encouraged via social media, email and printed advertisements to participate in the initiative by renting e-Bikes. Thus, the more bikes we rent the more advertisements are “on the road” as the e-Bikes will have “ESF e-Bike Initiative” decals on the frames and possibly saddle bags.

The ESF e-Bike Initiative website, at www.esf.edu/bicycle will also be a place for potential customers to view videos of our e-Bikes, promotions the initiative is running, register for rentals, and read literature on the many benefits of e-Bikes. The site will also feature a link to our suppliers’ websites for ordering electric bikes of their own. The use of this link will be the verification for our sales commission.

Promotion

How will you get the word out to customers?

Advertising: What media, why, and how often? Why this mix and not some other?

ESF e-Bike Initiative will be the buzzword at ESF, with promotions popping up from many different social media apps, campus bulletins, campus TV screens, and fliers. In addition each ESF e-Bike will have “ESF e-Bike Initiative” decals on the frames and possibly saddle bags. Thus the e-Bikes will serve as advertisements themselves, not to mention the social advertising via college students, faculty and staff riding and talking about the e-Bikes.

Our electric bike supplier will be asked to deliver promotional content to a variety of email listservs representing student groups on ESF, SU, OCC, and Le Moyne campuses. Advertising by word of mouth will be facilitated by the ESF Sustainable Energy Club, a club with over 20 determined students interested in Sustainability. The ESF and SU Honors students will be briefed on the program’s existence in their classes by Dr. Bill Shields and Ethan Requardt, and asked to participate in the program and bring along friends.

What image do you want to project? How do you want customers to see you?

ESF e-Bike Initiative is an honors project at SUNY-ESF. Our goal is to provide the community with a cost effective, sustainable, and healthy alternative to traditional transportation relying on combustion. The business should have a very “green” image, and to do this the ESF Bike Central will likely feature many recycled materials for signs

and furniture. Customers should see the initiative as a business that is working for them, improving their health, carbon footprint, financial situation, and above all else, safety. Thus customer service is a priority for the ESF e-Bike Initiative.

In addition to advertising, what plans do you have for graphic image support? This includes things like logo design, cards and letterhead, brochures, signage, and interior design (if customers come to your place of business).

ESF e-Bike Initiative e-Bikes will feature decals on the frames with the words “ESF e-Bike Initiative” and possibly on attached saddlebags. The only logo we will sport (for now) is the ESF logo, below.



Figure 3. SUNY-ESF Logo

Should you have a system to identify repeat customers and then systematically contact them?

Yes. Those who sign up for rentals will have entered their email address on the rental form and will be contacted with a follow up email, asking how their ride went and if they would be interested in another rental or e-Bike purchase from our supplier(s).

Social Media Campaign

Studies have shown that college-aged social media users tend to have more favorable attitudes towards advertising and social media (Chuan Chu, 2013). To take advantage of this hook to college students' attention and time, ESF e-Bike Initiative will post on social

media pictures of students, staff, celebrities, and faculty enjoying our e-Bikes in style. To accomplish this, ESF e-Bike Initiative will hire or give credits to a student, most likely from the Newhouse School of Public Communications photography program. The position/ "course" will be first announced to honors students, both at Syracuse University and at SUNY-ESF. Posters will later be set up if needed in Newhouse School of Public Communications and around ESF Campus, and announced on social media. The duty of the ESF e-Bike Initiative's photographer is to take pictures of the e-Bikes "in action" to post on the initiatives' Instagram, Facebook, Snapchat, and Twitter accounts, as well as to the ESF e-Bike Initiative website, and to our supplier, RAD Powerbike's website, and our other business partners', if any develop, websites as well. This will effectively ring the bell in potential customer's ears to be environmentally (and financially) responsible and rent an e-Bike from the initiative. This strategy will be more effective than emails or printed advertisements, because picture-oriented media such as Instagram and Snapchat and to a lesser degree the other social media sites are perceived as cool. High quality pictures of people enjoying the e-Bikes in unique places, like a national park, any beautiful natural area, or even on the way to work will be posted on these sites to effectively advertise to our market- college students especially. RAD Power Bikes even offer promotions (bike parts & accessories) to those who send in pictures, and perhaps a deal with them could be arranged for pictures of our business and customers for a stronger sales commission or another form of payment.

IV. **ESF Bike Central**

Is your location important to your customers? If yes, how?

Yes, the location needs to be centrally located, in that it will be an "ESF Bike Central." The ESF Bike Central will likely remain a temporary location, until a permanent ESF Bike Central can be constructed, possibly at the "Block D" site that is currently undergoing planning for another ESF residence hall and dining facility. This location is especially ideal, as it is located immediately next to 6 dorm buildings, on the border of the SUNY-ESF and Syracuse University campuses. The location is also close to the Marshal Square student center, a hub for restaurants and businesses catering to students and others.

If customers come to your place of business:

Is it convenient? Parking? Interior spaces? Not out of the way?

The ESF Bike Share Program has also requested to share this space (they rent regular bicycles) truly making the ESF Bike Central a hub for bicycle activity (the ESF e-Bike Initiative will remain a distinct business, but the two initiatives share many goals and operations.) The bikes from the ESF Bike Share Program will likely be stored outside the hub via standard bike racks.

Is it consistent with our image? Yes, in fact the ESF Bike Central will feature recycled materials for signs and furniture and aim to be as sustainable as possible. This will be accomplished through a design competition for ESF Landscape Architecture Students and SU students. The competition will be launched when further details (timing) of the ESF Block D construction are confirmed.

A Hub for Sustainable Transportation

Customers will want an eco-friendly building that is centrally located for transportation purposes and ease of access. The Hub will ideally feature a sustainable power source so the electric bicycles charged within will be sustainably powered. This renewable energy source, possibly solar, will be extremely visible and marketed to the public, and assist the school in its sustainability goals. Our campus Energy Manager has identified the ESF Bike Central as a potential solar site.

The hub will feature indoor storage and access to tools and information for riders on safety, repairs, ideal ride locations, and other activities. Activities will be launched as part of the initiative, like guided tours and trail biking rides to attract customers and maintain customer loyalty and support.

Business Hours: Consistent with the SUNY-ESF hours of operation (8-4:30 M-F), but weekend and night time access will be accomplished through a student I.D. swipe system.

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