

**Building a Safer Cycling Community:
The Baltimore/Washington Bicycle and
Pedestrian Path**

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December 12, 2013

Michael E. Jackson
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Dear Mr. Jackson:

I am writing to you to present my report on the creation of a bicycle path between Baltimore, MD and Washington, DC. I chose you as my audience for this report because of your extensive bicycle expertise, given your history working as the bicycle coordinator for many different departments of transportation. I also think that this will help to improve your recent 20-year Bicycle Master Plan by giving some insight on the needs of long-distance and commuting cyclists.

My qualifications for writing this report are more social and experience-related than professional. I am a student at the University of Maryland. I have written this report as part of a Technical Writing course at the University of Maryland. Additionally, I spent this summer cycling across the United States with the 4K for Cancer, a Baltimore-based non-profit organization. This year alone, I have biked over 5,000 miles, most of it during my cross-country trek. During my trip, I experienced many different types of cycling accommodations. I used this experience to inform my decisions regarding my recommendations in this report.

Thank you for taking the time to consider this report and for your hard work to improve the daily lives of cyclists and pedestrians in the State of Maryland. If you have any questions or want to discuss this report further, I am available by phone at 443-472-5676 or by email at sarahrobbins@comcast.net.

Sincerely,

Sarah M. Robbins

TABLE OF CONTENTS

- I. Introduction**
 - A. Problem Statement
 - B. Thesis
 - C. Overview of Report
- II. Scope of Argument and Report**
 - A. Inclusions
 - B. Omissions
- III. Background**
 - A. Bicycling: A Paradigm Shift
 - B. Tragedy: Why We Need Bicycle Paths
 - C. Judicial Road Blocks
- IV. Discussion**
 - A. The Baltimore/Washington Bicycle Path
 - B. Path Necessities
 - C. Commuter Accommodations
 - D. Finances
 - E. Temporary Alternatives to the New Path
- V. Recommendation**
 - A. Why Should We Take Action Now
 - B. Timeline of Action
- VI. Conclusion**

LIST OF FIGURES

- I. Figure 1: Injury Incidence by Mode of Travel per 1 Million Trips**
Data from Beck, Dellinger, & O'Neil 2007

ABSTRACT

Cycling can be dangerous when bikes and cars go head to head on busy roads. The high rate of fatal and non-fatal injuries sustained by cyclists discourages this healthy and sustainable method of travel in the State of Maryland, as well as across the U.S. Here I show that the establishment of an off-road, paved bicycle path from Baltimore to Washington, D.C. would help to alleviate some of the concerns of safety-conscious cyclists and would help to foster a more bicycle-friendly environment. Commuter accommodations are also important to help encourage long distance trips. By establishing this path, the State of Maryland will invest in the future of the environment and the health and safety of its citizens.

INTRODUCTION

This summer, I cycled across the continental United States with the 4K for Cancer, a non-profit organization based in Baltimore, MD. One of the organization's goals, besides raising funds to support young adults with cancer, was to inspire and unite the cancer community, which I helped to accomplish by undertaking a 4500-mile journey from Baltimore, MD to Portland, OR on my bicycle. During this trip, my team cycled an average of 80 miles per day for 70 days. We experienced many different types of roads, from dirt paths that were called state highways to off-road bicycle paths leading us up the Rocky Mountains. I became aware that the cycling community is at high risk. Not only did members of my team encounter difficult traffic situations and bad roads, but also many of us were injured due to these unsafe conditions. Luckily for us, none of these injuries were fatal. Unfortunately, that was not the case for another cross-country charity cycling team. My team crossed paths with the Central Route Bike-and-Build team, riding for Habitat for Humanity; they told us about the loss of one of their dedicated riders two years ago. In 2011, Christina Genco, 22, was killed after being hit from behind by an SUV (IsolateCyclist 2011). More investigation on this topic made me realize that this was not an isolated incident.

Problem Statement

Cycling on congested roads is highly dangerous. Cyclists often stick to the shoulder of the road if there is no marked bike lane or off-road bike path, but there are many problems with this. Not all roads have shoulders. Some that do have shoulders have areas where obstacles—for example, tree branches or large pieces of trash—cover the shoulder, forcing cyclists to use the same traffic lane as fast-moving automobiles. Compared to automobiles, bicycles are less massive, are less visible, and provide less protection to their operators. When battling with cars for valuable road space, cyclists often put more than their morning commute in danger. In 2010 alone, almost 800 bicyclists were killed and an estimated 515,000 were injured in accidents with automobiles in the United States (CDC 2013).

Thesis

Sustainable methods of travel, like cycling, are highly dangerous, especially in an environment without proper precautions. To make cycling a safe and attractive alternative to unsustainable gas-powered automobiles, bicycle options must be integrated into transportation infrastructure. In order to decrease the amount of unsustainable travel by residents of the Maryland-District of Columbia area, the Office of Planning and Capitol Programming in the Maryland Department of Transportation should plan to create a paved, off-road bicycle path from Baltimore, MD to Washington, D.C. to facilitate sustainable bicycle travel by offering a safe alternative to hazardous on-road cycling.

Overview of Report

I will prove, through a presentation of cycling hazards and incidence of cycling injuries, that the State of Maryland needs the proposed path from Baltimore to Washington, D.C. I will first discuss the background of the problem, including the tragic consequences of

dangerous cycling situations and judicial difficulties of rectifying this problem. I will then argue for the creation of certain requirements for the path, including physical specifications and commuter accommodations. I will follow this with a brief overview of financial needs. My next section will propose temporary solutions to this problem while the permanent path is built between the two cities. I will then summarize my recommendation and emphasize the importance of acting to correct this issue. I will then conclude my argument with a review of the benefits this path would bring to the State of Maryland.

SCOPE OF ARGUMENT AND REPORT

The scope of this report will be limited to the necessity for this path and some of its basic needs, both structural and financial. This limitation is not due to dearth of information on this subject, but because of my own limited resources as a student at the University of Maryland.

Inclusions

First, I will discuss some background to this issue in order to convince the Maryland Department of Transportation's Office of Planning and Capitol Programming of the necessity for my suggestion. I will use my expertise gained through my experience this summer to guide the rest of the report. I am particularly qualified to discuss the structural necessities of a path for long-distance cyclists. I will use this experience to speak to the necessary parts of the path, including width, paving, and signage. This information could also be used for the construction of bike lanes and other bicycle paths in the State of Maryland. Additionally, I will use my familiarity with the Adventure Cycling Association, which has created many of the most well known on-road cycling paths in the U.S., to guide my recommendation regarding temporary alternatives to the construction of a permanent paved path.

Omissions

I will not discuss the specific cost breakdown or mapping of the path due to limited resources. I will give a broad estimate of costs based on similar path constructions, but will not separate parts of this cost for the State of Maryland. Further financial analysis might be done should this plan be adopted. I will also give a broad recommendation for the location of the path, but will not attempt to map its exact route from the District of Columbia to Baltimore. Despite the limited scope of this report, I will conclusively prove why this path is necessary.

BACKGROUND

In this section, I show that the benefits of cycling as a sustainable and low-cost method of travel are not being fully utilized by residents of Maryland. This may be due to the hazards, including high fatality and injury rates, inherent to cycling without proper infrastructure.

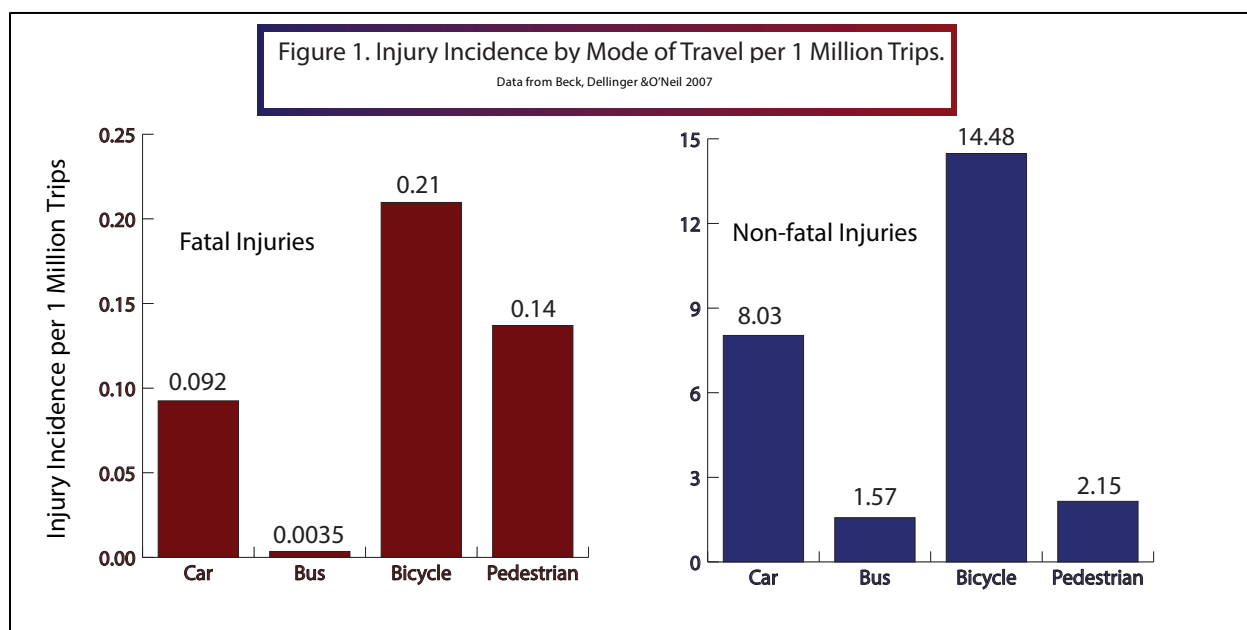
Bicycling: A Paradigm Shift

Bicycling has been shown to be one of the most healthy and sustainable ways to travel. Not only is cycling much less expensive than driving, but it also is a great way to exercise, reduce stress, improve coordination, and boost heart health (Travers, 2009). Cycling is inherently more sustainable than driving because it does not require the burning of fossil fuels and does not emit greenhouse gases into the atmosphere. Parking lots also create run-off pollution; bikes need much less parking space than cars, which might help to save local streams from pollutant build-up.

Despite the overwhelming benefits of cycling, many people choose not to travel by bicycle due to limited route options. Cyclists share the road with automobiles, which are much larger and faster. There are more cars on the road than there are bikes, largely because cars can transport more than one person and can move much more quickly than bicycles. Transportation infrastructure caters to automobiles for the most part, which leaves cyclists in a difficult situation. Options for cyclists in Maryland are fairly limited. According to the Maryland Department of Transportation, only four bike paths are well-established in the state: the Rock Creek Trail System, the Anacostia Tributary Trail System, the Baltimore-Washington International (BWI) Airport Trail, and the Baltimore and Annapolis (B&A) Trail (Maryland Department of Transportation, 2013). These paths do not span large areas, but are mostly confined to small areas in the state.

Tragedy: Why We Need Bicycle Paths

One of the main deterrents for cyclists is a high incidence of accident-related injury and death, especially when cycling is compared to other modes of travel. Figure 1 below shows that the incidence of injury for cycling is considerably higher than the incidence of injury by any other mode of travel, including cars (Beck, Dellinger & O'Neil, 2007).



From Figure 1, it is clear that bicycle travel is significantly more dangerous than motor vehicle travel, especially public transportation by bus. However, I would like to draw your attention to the injury incidence rate difference between cars and bicycles. While cars move much faster and are in general must battle more traffic, especially on highways, than bicycles, bicycles still have a higher injury incidence rate, both fatal and non-fatal. Public transportation and cars are less dangerous because of the existing infrastructure for these modes of transportation. Pedestrians also have access to sidewalks in most places, which keeps them from battling much larger cars and buses for space.

Despite the absence of bicycles on fast-moving and high-traffic highways, cyclists still face dangerous conditions, like blocked shoulders, on smaller roads. Like I mentioned in the section titled 'Problem Statement,' cyclists often use the shoulder of the road in order to stay out of the way of cars. However, shoulders often serve as extra on-road parking spaces in residential areas or can be blocked by debris, like tree limbs or trashcans. Without this safer space, cyclists share the road with cars. Many bicycle-motor vehicle accidents occur when cars try to pass slower-moving cyclists or at intersections where miscommunication may lead to tragic collisions.

Judicial Road Blocks

In cases of vehicle-bicycle accidents, jurors often sympathize with drivers. Jurors often recognize that even they might make a mistake when driving—as such, they often find drivers not guilty of vehicular manslaughter or similarly severe judgments, even in cases of clear culpability. Daniel Duane, a San Francisco cyclist, found that there was not one case of driver prosecution in cases of a vehicle-bicycle accident involving cyclist fatality, except in cases of DUI or hit-and-run (Duane 2013). In the State of Oregon, the maximum penalty for killing a cyclist while driving is license suspension and a fine of \$12,500 (Duane 2013). In comparison, 2nd degree vehicular manslaughter, a Class B felony, can result in a sentence of up to ten years in prison (Shecter, 2013). Cyclists should not have to wait for the legal system to recognize this disparity and ensure their safety through punishment of offenders. Instead, the State of Maryland should move to create a safer environment for users of this method of sustainable travel.

Many bicycle safety organizations place the onus of protecting cyclists on the cyclists themselves, encouraging wearing blinking lights, signaling all turns with hand movements, and riding with, instead of against, traffic. While these initiatives are important in educating cyclists on how to protect themselves, they ignore the many viable options for creating safer, larger-scale solutions, such as state-sponsored bicycle infrastructure.

DISCUSSION

In this section, I will discuss one potential solution, a bicycle and pedestrian path from Baltimore to Washington, D.C., to the hazardous conditions faced by Maryland cyclists. I will discuss some details concerning the paths creation, including physical needs and

commuter accommodations. Additional considerations for a project of this caliber might be funding concerns and temporary solutions as the long-term path is being built.

The Baltimore-Washington Bicycle and Pedestrian Path Overview

My solution to the problems faced by Maryland and D.C. area cyclists is to build a paved, off-road bicycle and pedestrian path from Baltimore, MD to Washington, D.C. The path would be a resource for both cyclists, whom this report focuses on, and pedestrians in the State of Maryland. In order for the path to be a good resource for both commuters and recreational bikers, the path must be carefully planned. In order to make this project a success, proper financial planning must also occur prior to construction. In the interim time, hazardous conditions can be temporarily alleviated by other alternative, if less attractive, methods.

Path Necessities

To attract cyclists to the path from hazardous road conditions, the path must be safer and easier to use than the alternative roads. Creating a safe, beautiful, and well-maintained path will encourage increased usage of the safer alternative; a path that is not well planned might not enjoy the level of dedicated usage that a more organized path would. I will discuss why I have chosen an off-road, well-paved path with accommodations for commuters as the best alternative for my proposal.

Off-Road

The path must not be on the same road as automobiles namely for the preservation of the safety goals of this path. The off-road path will be a more direct route between the cities than the more circuitous roads shared by cars, which will further encourage its usage by local cyclists. Removal of bikes from roadways will not only limit congestion on roads for automobiles, but will also keep automobiles from taking up space that is meant for bikes. A study in Beijing showed that exclusive bike lanes or paths tend to increase use of the bicycle overall (Zhao 2013).

Additionally, this will remove cyclists from harmful automobile exhausts. In 2012, scientists in Brisbane, Australia used popular high and low traffic bicycle routes to quantify the effects of ultrafine exhaust particles on cyclist health. These particles can cause decreased cardiopulmonary health, despite increased physical activity. They found that in low traffic environments, the inhalation of ultrafine particles was reduced up to 48% and, like in this report, suggest to urban planners that creating less hazardous environments for bicycles would be beneficial (Cole-Hunter et. al. 2012).

Pavement

The path should be as well paved as the local roads because pavement makes biking much easier. Smooth paving not only cuts down on the effort of bicycling, but also reduces the amount of biking accidents. The path should be at least 10 feet wide in most places; this

will give bikers and walkers enough room to either pass a person that is moving more slowly and will also give them the opportunity to bike or walk side by side with a friend or family member. Because a wide path facilitates interaction with other people, path users will be encouraged to bring others to enjoy the path as well. Additionally, a wide path reduces the amount of biking accidents because it cuts down on congestion. Sudden slowing and stopping causes most biking accidents when automobiles are not concerned. This could be due to obstacles in the traffic lane or trying to pass without enough room—both of these could be avoided if the path was wide enough.

The pavement should also have a line down the middle for the same reason that most roads are well lined—creating traffic lanes helps to make the road more user-friendly. Putting a line down the middle of the road would also make it easier for commuters to travel at a fast rate of speed on their side of the road, since they will not collide with other bikers or walkers head on.

Location Planning

The location of the path is very important to the success of the path. The path should be widely accessible to the largest amount of people possible. This is also the reason for connecting the path to two cities—both Baltimore and Washington, D.C. have huge populations. Also, these highly populated areas are most at risk for high-traffic areas that are dangerous for cyclists. Choosing the most direct path between populated areas will not only allow more people to use the path, but will also prevent a greater number of accidents and collisions. The path should not be circuitous or out of the way because an extra mile or two makes a much larger difference to someone who is pedaling for an extra ten to fifteen minutes compared to someone who is sitting in a car for an extra two or three minutes.

One of the first steps the Office of Planning and Capitol Programming might take is to determine where the path might run specifically. Because the Office has control of the planning of new bike routes in the state, office members and collaborators might work together to determine the best route for the new path, especially in conjunction with other paths currently under construction or those that are already established in the State of Maryland or the District of Columbia.

Commuter Accommodations

Because this plan caters to commuters as well as exercisers, the path must include some special considerations for them, including terminals at important spots along the path and bike racks for added security.

Entrance Terminals

Entrance terminals for commuters and recreational users alike would make the path a more attractive option. Nkurunziza et. al. 2012 showed that direct cycling route was not enough to convince non-cyclists to adopt bicycling over their current mode of transportation; instead, absence of safe parking and changing areas was a big deterrent for

bicycle commuters in Tanzania (Nkurunziza et. al. 2012). By creating terminals with these amenities, the MDOT might encourage more use of the path.

Terminals might include water fountains, coin-operated lockers, lockers that are rentable monthly or yearly, and bathrooms. Water fountains are necessary to keep runners, walkers, and cyclists from dehydration during their physical activity on hot days. Coin-operated lockers are easy to use and good for recreational travellers who might want to store car keys, snacks, or other equipment they do not want to carry on their ride. Yearly or monthly permits might encourage commuters to continue to use their bicycles since they have already paid to use the locker space. Bathrooms would encourage walkers and bikers to take longer trips along the path, since facilities would be available to either change clothes or use the restroom before continuing on to their destination.

The location of these terminals should be determined after the route of the path is fully planned. It would be most beneficial if the terminals were evenly spaced along the path, but also served all of the most popular places to enter or leave the path, such as at the beginning and end.

Property Security

Though most bicycles are not nearly as expensive as cars, they are still very important and precious to their owners. Most commuters will probably be using road or touring bicycles, which normally cost between \$1,000-\$5,000, though some can cost as much as \$10,000 or more. These bicycles are a significant investment and represent a viable mode of travel for these commuters, some of whom use bicycles to replace more expensive motor vehicle travel.

An Austrian study at the University of Graz showed that among university students, high security for bicycle parking and positive peer attitude toward cycling were positively correlated to regular bicycle use (Titze et. al. 2007). Irregular bicycle use, conversely, was encouraged only by ease of physical effort and environmental friendliness (Titze et. al. 2007). In order to sustain a large commuter population, security is important, as shown in this study. Though this study was limited to a small university group of approximately 500 students, its results can be used to benefit a much wider population in the MD/D.C. metropolitan area.

At each end of the trail and at important terminals in between, the path should have bike racks that cyclists can use to secure their property. These racks should be made of a thick and tough metal, so that thieves cannot easily cut through them. Signs by the bike racks should tell users that they can use the racks with their own U- or cable locks. An additional way to raise revenue from the path might be to offer permits for the bike racks at the ends of the paths. These permits should cost much less than the price of commuting by car, since a higher price would deter cyclists from using the path to commute.

Finances

A mix of both public and private investments could finance this path. The MDOT might choose to contribute to this path, especially if it would mean both a decrease in accident expenses and potential revenue. The decrease in accidents between automobiles and bicycles would help to cut back on the \$5 billion lost annually in the U.S. due to cyclist crash injuries (CDC 2013).

Public Tax Funding

Public funding might not need to be taken from the MDOT's regular budget or might, in a sense, be simply borrowed and repaid over time. As I mentioned in the 'Commuter Accommodations' section above, both lockers and bike racks for commuters are a built-in method of creating revenue from the path since the MDOT might charge path users to utilize these amenities.

The MDOT might also advocate some tax exemption for cycling commuters on the path, since these people help to reduce road congestion. The earlier Tanzanian study also showed that tax exemptions have a strong positive influence on bicycle use (Nkurunziza et. al. 2012). The same principles, supported by this research, could be used to promote the Baltimore/Washington Bicycle/Pedestrian path. The study also advocated for car congestion charges in areas of heavy motorized traffic, but this would be much more controversial and is not recommended (Nkurunziza et. al. 2012).

Private Funding

Both sustainability and cycling advocates and organizations might contribute to the construction of a path like this. Private funding from both groups would help to create lasting support for the new path's construction from those with vested interests. Sustainability activists would be drawn to the path because of its use to reduce the amount of unsustainable, motorized travel. Presentations to these individuals or companies might emphasize this aspect of the path, especially its focus on the needs of commuting cyclists.

Cycling organizations, since often cater to both regular and recreational bicycle users, would benefit from a shifted focus. Presentations to cycling organization might include both the needs of commuters but also would discuss the benefits that recreational cyclists might draw from a path like this one, especially by using examples of past bike path successes in other communities.

Temporary Alternatives to the New Path

Because this new path between Washington, D.C. and Baltimore will take time and money to build, a temporary solution to the safety issues that many cyclists face is the establishment of bike lanes. Bike lanes will not constitute a permanent fix for this problem. They, like road shoulders, are often disregarded and used as extra parking spaces or are littered with debris, which again forces cyclists into the same traffic lane as cars. However,

they do alert other vehicles that bicycles may be present in an environment, which can contribute to increased safety and awareness for both cyclists and drivers.

To establish a known bike route, the Office of Planning and Capitol Programming should apply to the American Association of State Highway and Transportation Officials' Special Committee on U.S. Route Numbering. This committee marks and catalogs U.S. highways, roads, and bicycle routes, such as the well-known Bicycle Route 76. The establishment of a numbered U.S. route would help increase local cyclist awareness of the safest route in the area (Adventure Cycling Association).

This new route should be established on the roads that are as close as possible to the new off-road path. This location could advertise the new path that will be built in the area and acclimate cyclists to getting to and from the area of the new path before it is even built.

RECOMMENDATION

In this section, I will recommend that this path be built as soon as possible in order to save lives, save money, and save the environment. I will also suggest a timeline of action that will be helpful to the Office of Planning and Capitol Programming if it chooses to move forward with this plan.

Why We Should Take Action Now

Save lives

The CDC reports that the rate of bicycle-related injuries and deaths has continued to increase in recent years (2013). If the rate of injury and death stays at levels observed in 2010, over 8,000 people will be killed and over 5 million will be injured in bicycle related incidents in the next ten years in the U.S. (CDC 2013). To help cut down on these injuries in the State of Maryland, the MDOT should immediately take action to make cycling safer, so that the rate of injury starts to decrease.

Save money

As I mentioned previously, the cost of cycling injuries and deaths is annually approximately \$5 billion in the U.S. (CDC 2013). A portion of this money is lost in our own state. The cost of this path, while a significant capitol investment, would cut down on these substantial losses. The tax revenue gained from such a path, though probably not as large of a sum, would also help to offset the costs of maintaining the path.

Save the environment

The environmental benefits of biking have not been extensively discussed in this report. However, they are an added reason why this plan should be adopted. Biking helps to cut down on motorized travel by offering a more environmentally friendly alternative, given that this alternative has the same safe infrastructure as other modes of travel.

Timeline of Action

This timeline will lay out some of the necessary steps to put this plan into action. However, other measures could and should be considered in addition to the ones presented here as the path is being planned and constructed.

Immediate Steps

Some immediate steps that should be taken to ensure the path's viability are as follows:

- Consult with the Office of Planning and Capitol Programming to ensure that the path fits in with the current 20 year Bicycle Master Plan
- Confirm the viability of this plan by examining additional research concerning urban bicycle paths

Mid-term Steps

Mid-term steps should be completed within the year, as this will ensure that the path's completion is not delayed. Some mid-term steps to consider include the following:

- Consult with the American Association of State Highway and Transportation Officials' Special Committee on U.S. Route Numbering to establish a bicycle lane route
- Secure public and private funding for the bicycle path
 - Consider private companies that have funded cycling endeavors in the past, such as Velo Capital Partners, a company that has recently raised \$132 million to invest in cycling projects (Bernhard Jr, 2013)
 - Consider non-profits like the SRAM Cycling Fund that already advocate the construction of cycling infrastructure (SRAM 2009)
 - Present the project to other branches of the MDOT and Maryland government for endorsement
- Plan the route of the path through Maryland

Final Steps

Final steps cannot take place until most of the mid-term steps are completed. These steps should finalize the planning and begin the construction of the new path:

- Secure additional funding, both public and private, if possible
- Advertise the new bike path on the temporary bike lane and in local media to alert cyclists that the new path is coming soon
- Begin construction by contracting a financially reasonable and reliable construction company
 - Start path construction
 - Start entrance terminal construction
- Consider other ways to attract cyclists to the new path, including tax exemptions for using environmentally friendly modes of travel

CONCLUSION

In this report, I have outlined how the State of Maryland can improve dangerous biking conditions, a strong deterrent for regular cycling, for Maryland cyclists by creating a well-planned, separated bike path from Baltimore to Washington, D.C. By improving the infrastructure for this sustainable and healthy method of travel, the MDOT might also be able to cut down on unsustainable motorized travel. Going forward, the MDOT should continue to support additional projects that would create a foundation for sustainable travel in the state. By doing so, the MDOT can improve the long-term health and safety of the citizens of the State of Maryland. Reliance on unsustainable modes of travel not only destroys the environment now, but also doesn't help to prepare for the future. Investment in cycling, and other sustainable initiatives, may benefit the state's future generations for years to come.

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