Williamstown Bike Path

Brendan Bossidy, Nikki Caravelli, Annie Tewksbury, Grace Weatherall

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Finally, thank you to all the members of the Williams community who took the time to respond to our survey, the results from which guided the direction of our project.

II. INTRODUCTION

A. PROJECT GOALS

As commissioned by our client, Shaun Garvey of Williams College Facilities, the object of our project is the proposal of an east-west bike route, to pass through the south end of the Williams College campus and downtown Williamstown. We have designed a route that connects
South Street to Water Street, working within the confines of construction plans for the area. We have evaluated student, faculty, and staff needs and interests through a campus-wide survey (Appendix A) and have consulted with several experts regarding College and town construction plans in order to come up with a route that is both feasible and desirable.

In proposing this bike path, we are working in the context of several long term goals. First, we are addressing a demand for increased campus connectivity and bikeability. Over half of our survey respondents reported to own or rent a bicycle on campus, and 43.2% bike daily or weekly. Williams College has seen a large increase in cyclists in recent years: half of the 1,451 bikes registered since 1993 were registered within the last four years. However, survey respondents expressed much dissatisfaction with biking conditions on campus. Fewer than 60% of cyclists in our survey indicated that it was at least “somewhat easy” to bike around campus, and many expressed demand for additional bike paths on various routes around campus. If implemented, our project will facilitate biking on the south end of campus, where few options currently exist. Furthermore, we hope that the creation of this route will spur the development of more paths in the area, creating a more bike-friendly campus.

In working to increase bikeability, we also hope to promote behavioral shifts regarding transportation methods on campus. By providing easy access to destinations around campus, connected paths will encourage more people to bike. This would provide many benefits to the College and town, including improvements in the health, safety and convenience of community members. Further, we see a bikeable campus as a method of increasing tourism in Williamstown and therefore promoting local business success. With the creation of the

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1 Survey, Appendix A.
2 Interview with David Boyer, Director of Campus Safety and Security, November 13, 2015.
3 Survey, Appendix A.
Ashuwillticook Trail nearby, bike tourism is increasing in popularity in the Berkshires, and we hope to draw some of these visitors into Williamstown. Additionally, our path would provide visitors a direct connection between Spring Street and the Clark Museum: two of the top destinations for tourists in Williamstown. The current plans for a new hotel on Spring Street render this connectivity particularly valuable in providing visitors with an enjoyable experience.

Our environmental goals in increasing bikeability also align well with recent College statements regarding campus environmental goals. In a recent message regarding the College’s role in addressing climate change, President Adam Falk and the Board of Trustees noted that our impacts come not just from our facilities, but our behavior:

“We cannot claim to exercise moral leadership in addressing the problem of climate change without making meaningful changes not only to campus buildings and in how we purchase electricity but also in the way we choose to live. Thoughtful consideration of and adjustments to our own consumption of fossil fuels and other resources are of both practical and symbolic importance, and should play a very meaningful role in the education we provide students. Our community will explore potential changes in policy and practice that would support short- and long-term reductions in energy use on campus.”

Introducing bike paths and improving bikeability in surrounding areas will encourage use of bikes and discourage auto use, working toward making biking easier and more efficient than driving on campus. This serves as a behavioral indicator to the campus community and wider public that the College is indeed investing in sustainable practices. Moreover, by reinforcing biking behavior, students may develop an intuition and preference for bikeable communities and biking as an alternative mode of transport post-graduation. More directly, improving the

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bikeability of the Williams College campus will help the College achieve its emissions goals over the coming goals. Improved local bikeability will also improve the “green community” image that Williamstown itself seeks to promote.

With these visions in mind, we view the creation of our proposed path as the first step in a larger process toward a healthier, safer, and greener community through increased bikeability.

**B. PROJECT BACKGROUND**

In 2011, Williams College hired Alta Planning + Design, the nation’s leading active transportation consulting firm, to study the bikeability of campus. They composed a “Bike and Pedestrian Master Plan: an evaluation of the existing conditions for cyclists and pedestrians on campus”.

The plan notes that while biking is common among students, there are many safety and connectivity issues that make the campus not ideal terrain for cyclists. There are no designated bike lanes or paths on campus, and the currently used routes are insufficient and problematic. Without designated bike lanes, cyclists are forced to use crowded sidewalks and busy streets, situations that poses safety hazards to cyclists, pedestrians, and drivers. Other problems include poor lighting, stairways, curbs, and slope changes along the most travelled routes. In the results of our survey, nearly a quarter (23.3%) of non-cyclists cited safety as a major factor in their decision not to bike on campus.

One of the main aspects of campus bikeability is the lack of any direct east-west route. Route 2 is dangerous: highly trafficked, narrow, and poorly lit. In addition, it is hilly and generally undesirable to bike along, but there are currently no alternatives that can take cyclists directly across campus. Our proposed project on the south end of campus, which would safely do

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6 Survey, Appendix A.
just that, garnered significant support from survey respondents. Specifically, 58.3% said that they would be likely to use our path. The path would provide access to some of the furthest points on campus, including Garfield House and Weston Field, and improve access to destinations off campus, such as the Clark.

Garfield House houses 60 students, and these residents currently have no appropriate east-west route available to them, even as pedestrians. One commenter on our survey lamented their post-practice “walk back to Garfield from the Fieldhouse/Track” and said that our project would be “awesome.” A student living on Hoxsey commented, “this [path] is something I would use all the time.” Another respondent noted that, “It is very unfortunate to be trying to [get] back to campus from South Street … A dedicated bike lane would be fantastic.” Many students need to go to Weston Field on a daily basis for athletics, and a bike route would make this journey easier and faster. The route would also serve Agard House and the new dorm, currently under construction. A direct connection to downtown, where these students can access the coffee shop, new bookstore, and other businesses, would get a lot of use.

Shaun, our client, chose to focus on the south end of campus because of the opportunity provided by the many building projects planned for the area. This construction allows us flexibility in planning a path, as major work is already being done all along our proposed route. The creation of a new bookstore, dorm, science center, and inn on the south end of campus will occur over the next five years. To facilitate this construction, Walden Street will be extended to South Street, and at least the new section will become a two-way road. This is necessary for the

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7 Survey, Appendix A.
increased traffic associated with the implementation of these projects, but it has the added benefit of creating the potential for the installation of on-road bike paths.

III. BIKE PATH CONSIDERATIONS

A. SITE DESCRIPTION

Our proposed bike path will connect South Street to Water Street, as shown on the map above. We have divided the site into four different sections for the purpose of evaluating the appropriate type of bike path for each part, depending upon specific circumstances of each section. The first section (hereafter described as Section One) is the new extension of Walden Street, which will be 36 feet wide and will run for 0.15 miles, connecting South Street to Hoxsey Street. The second section (Section Two) is the existing Walden Street, beginning at the intersection with Hoxsey Street and ending at Spring Street. Walden Street is 24 feet wide and has a length of 0.14 miles. The third section (Section Three) is the stretch of existing two-way road at the bottom of Spring Street, including the intersection of Walden Street and Spring Street.
Street. This stretch is 36 feet wide and runs a distance of 0.04 miles (220 feet). The last section (Section Four) consists of Latham Street, which is 24 feet wide and runs a distance of 0.21 miles.

**Section One: New Road**

![Figure 2. Aerial view of Section One](image1)

![Figure 3. Site of proposed road which will comprise Section One](image2)
Section Two: Walden Street

Figure 4. Aerial view of Section Two

Figure 5. Site photos of Section Two
Section Three: Intersection of Walden Street and Spring Street

**Figure 6.** Aerial view of Section Three

**Figure 7.** Site photo of Section Three
Section Four: Latham Street

Figure 8. Aerial view of Section Four

Figure 9. Site photos of Section Four

i. Construction Plans

In our design we considered five major construction projects in development: the new dorm on Stetson Court, the new college bookstore planned for the north corner of Spring Street and Walden Street, the new Williams Inn at the intersection of Spring Street and Latham Street,
the reconstruction of the science center, and the extension of Walden Street into a new two-way road between Hoxsey Street and South Street.

The new dorm is unlikely to present us with much of a planning problem, because the site is already finalized. The location of the new dorm does not interfere with our route, and construction will be completed before the town breaks ground on the new road.\textsuperscript{8} However, it is worth noting that residents of the new dorm, planned for 60 beds, will have great access to our path.

The new bookstore planned for the northwest corner of the Walden and Spring Street intersection is also unlikely to interfere with our bike path. With the proposed location in mind, we have formulated our route options to be on the south side of Walden Street, avoiding interference with the site plans. Though, our bike path would also provide excellent accessibility to this new attraction.

The exact site of the Williamstown Inn project on the intersection of Spring and Latham Street has yet to be definitively established, but two proposed options are on the existing parking lot across from Tunnel City Coffee or set off the southwest side of the intersection. The project may involve expanding the parking lot up to the southwest corner of Walden and Spring Street\textsuperscript{9}. All of our proposed routes must navigate both of these intersections, which creates some potential for interference. Unfortunately, as of the publication of this report in December 2015, the Williams Inn project has not yet been assigned a project manager by Williams College and plans for the hotel are currently unknown. Therefore while we are unable to consider a specific location it in our route evaluations, we must be careful to produce a variety of possible options,

\textsuperscript{8} Interview with Rita Coppola-Wallace, Appendix B.
\textsuperscript{9} ibid
such that at least one of them will be possible, no matter which final site is chosen for the new Williams Inn.

Finally, the remodelling of the Williams College Science Center may alter the current state of Walden Street. Williams College informed us that the end of Walden Street that borders the site of the new bookstore may be moved to a new a path around the current parking lot, and bypass Spring Street to connect with Latham Street directly. However this plan is still in its most beginning stages, so we cannot depend upon this change in our planning of bike routes. More relevant to our project, the college and town are planning to make Walden Street a two-way road again to accommodate for this construction\(^\text{10}\), which opens the possibility for safer on-road bike lanes.

The new Walden Street extension, is a helpful starting point for our project. The existing plans for the extension already include a bike path of some kind along this new road. Therefore our role for this section becomes one of advising on the type of bike route, rather than lobbying for the existence of a path itself.\(^\text{11}\) We hope that this planned path will facilitate our proposal for the rest of the route.

**B. LAW, POLICY, AND STANDARDS**

* i. Bike Path Design Options

Most of our project will occur on privately owned Williams College land, and will not require federal or Massachusetts DOT funding. However, MassDOT design standards are still important to consider here to maximize the feasibility and appeal of the project. If the project

\(^{10}\) ibid

\(^{11}\) ibid
complies with standardized measurements and path gradients the project will also most likely ensure the greatest safety and accessibility of the connecting roadways and biking intersections inherent in this project. For this reason, we have considered the various design standards from MassDOT, which also comply with federal standards. There are two categories of standards to consider. First, we looked at standards for an off-road “shared use” path separated entirely from adjacent roadways. Next, we looked at standards applicable to bike lanes painted on the roadway; these come in three forms, separate lanes, partially shared lanes, and shared lanes. We also look at two other on-road design ideas for which there are no MassDOT standards: contraflow lanes and advisory lanes.

1. Shared Use Paths (Off-Road)

Shared use paths are typically ideal in the following circumstances: in proximity to high speed roads, in areas where significant auto traffic and constrained road size inhibit cyclist and pedestrian safety, or as a recreational amenity. Such a path is entirely separated from the road, ideally (and in accordance with standard) with either a 5 foot clearance between path and road or a sizable barrier to indicate the separation of motorist and cyclist/pedestrian traffic.12 Figure 10 below gives a vertical cross section of pathway and roadway separation and dimensions:

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Excluding the distance from the road, the built path should be 14 feet wide at minimum, and up to 23 feet if possible to maximize the safety and comfort of travelers. These widths include the travel lanes of the pathway (4-5 feet wide in each direction) and the gradated shoulders (2-3 feet on each side). The ideal dimensions include a 3-5 foot wide “recovery area” where cyclists, etc. can pull to the side. There must also be 8-12 feet of vertical clearance from the surface of the path upward.

Other design considerations include planning to accommodate an average cyclist speed of 20 mph, and ensuring that gradients are conducive to pedestrians, meaning that any ramps or gradients cannot exceed 8.3% of an incline. Turn radius is also important, as bike pedals may
scrape the ground due to the angulation of the bike during at-speed, sharper turns; see the below table for speed to radius recommendations.

<table>
<thead>
<tr>
<th>Design Speed (mph)</th>
<th>Minimum Radius (feet)</th>
</tr>
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<tbody>
<tr>
<td>12</td>
<td>36</td>
</tr>
<tr>
<td>15</td>
<td>56</td>
</tr>
<tr>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>25</td>
<td>156</td>
</tr>
<tr>
<td>30</td>
<td>225</td>
</tr>
</tbody>
</table>


**Table 1.** Bike path curve restrictions

Shared use bike paths have proven to be successful in many parts of the United States, especially to promote tourism. For example, the Ashuwillticook Bike Trail is a shared use path. Another example of this approach to bike paths is the city of San Diego, which boasts 620 miles of bike lanes, many of which are shared use bike paths. San Diego’s extensive bicycle program, managed under the city government, reports that its shared use bike paths “provide critical connections in the city where roadways are absent or are not conducive to bicycle travel.” One such bike path is the Bay Side Bikeway, a 24 mile shared use bike path that circles the San Diego Bay, and serves as a successful tourist attraction, featured on tourist websites and drawing in visitors who want an easy and pleasant way to explore the area.

Additionally, Cape Cod has 114 miles of shared use bike paths among its various towns. These trails offer ease of sightseeing and have become a tourist attraction advertised everywhere from tourism websites to the Cape Cod Chamber of Commerce and the National Parks Service.

2. On-Road Bike Lanes

There are currently four accepted standard on-road bike lane designs for the inclusion of cyclists that are relevant to our area: separate accommodation for all users, partial sharing, shared motor/bicycle accommodation, and contraflow lanes on one-way streets. Figures 11-14 visually demonstrate the spatial configurations of each.

![Case 1: Separate Accommodation For All Users](image)

**Figure 11.** Bike lane visualization

The ideal on-road bike lane system is “separate accommodation for all users,” which allocates unique spaces for pedestrians, cyclists, and motorists, with bike lanes on either side of the roadway and sidewalks. The bike lane is located along the road shoulder, should be 4-5 feet wide, and is designated with a stripe. If parallel parked cars are present, as they are along much of our route, a designated cyclists-only lane would have a 5 foot minimum. The auto travel lanes

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should be an average width of 11-12 feet. The sidewalk should be 5.5 feet wide including the curb.

Cities and towns across the country, both large and small, are successfully implementing this method of separate accommodation for all users. Chicago is one city that has adopted this model, by creating 1.2 mile two-way bike lane along one side of Dearborn Street, beside the sidewalk. This project has been hugely successful. In the year since the project was completed, bike traffic along the route more than doubled, according to Chicago DOT. In fact, the path has become so popular that it earned its own Twitter feed.

In conclusion, separate bike lanes are the safest option, and our primary proposal for Section One, the only section wide enough to accommodate for them. A “partial sharing” lane is applicable if the separate lane designation is not available due to width constraints, which is common in town centers and higher density areas. The bike lane is no longer exclusively designated for cyclists, as motorists may partially use the lane. The same

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sidewalk and travel lane widths as those required for separate accommodation apply. The bike lane/shoulder in this case is narrower, usually 2-3 feet wide. This type of configuration might require a “design exception” from local planning authorities. It would also require “share the road” signs in order to indicate the mixed use nature of the bike lane to motorists and cyclists. Partial sharing implies a tradeoff between allowing space for bus and truck travel and keeping the shoulder lanes wide enough to be functional for bikes. If the shoulder is too narrow, cyclists are forced to ride directly on the painted lane markers instead of outside them, coming very close to vehicle traffic.

Despite these potential difficulties, the partial sharing method is very common. Portland, Oregon is one major city that utilizes this design strategy, adding significant bicycle signage to “Bicycle Boulevards” or “Neighborhood Greenways” that experience light vehicular traffic.\(^\text{20}\) Portland defines this design as “routes where bicycles are given priority of movement,” and is working to increase the miles of bike lanes that already exist.\(^\text{21}\) In 2010, the plan was for 80% of Portland residents live within half a mile of such a boulevard by 2015.\(^\text{22}\)


“Shared Bicycle/Motor Vehicle Accommodation” is another design method common in town centers, particularly in dense areas where traffic is slow. The design designates a separate (average size) sidewalk for pedestrians, but bikes and vehicles share a lane. There is no shoulder in this configuration, and a design exception would also be required here. The lanes should be at least 14 feet wide, with clear signs and pavement markings to indicate shared usage of the travel lane.

Despite their limited infrastructure, shared lanes have demonstrated success throughout the country. For examples, San Francisco, California is one major city that used shared lane markings in an attempt to make bicycle and vehicle sharing of the street safer. A study of the San Francisco project found that the markings improved both cyclist and motorist behavior, and decreased the incidence of “wrong way riding” for cyclists. The markings also reduced aggressive motorist behavior, and increased the distance to park cars from both cyclists and motorists.

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25 ibid
Case 4: Contraflow Bike Lanes

A contraflow lane is used on one-way streets, such as Spring Street, to help cyclists travel against the flow of traffic. The lane is usually placed on the right side of the road unless unusual conditions such as intersections or other obstacles prevent this placement. MassDOT advises that a contraflow lane be separated from the motor traffic lane by a six-inch solid white line and a four-inch line separating parked cars. Generally, placement of the lane in between parked cars and the sidewalk is inadvisable due to decreased visibility for the cyclist, the danger posed by opening car doors, and the possibility that parked cars will encroach on the space. However, it may be possible to design such a lane with these considerations in mind.

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Case 5: Advisory Bike Lanes

Another type of on-road design good for narrow roads is an advisory bike lane, a concept not heavily used in the United States but one that has been implemented successfully throughout Europe. These are cyclists lanes which require the removal of the median line on a two way roadway, and the demarcation of two 4-8 foot one-way bike lanes on each side of the road separated by the road with dashed lines. The remainder of the road becomes a sixteen foot through auto lane in the center of the road. Cars drive in the center lane and merge into the bike lane if necessary to pass, and provide right-of-way and yield to the cyclists. This type of bike lane is ideal for narrow roads that do not allow for the addition of separate bike lanes with high levels of bike traffic and low levels of car traffic. Advisory lanes are currently widely used in Europe, in the cities of Minneapolis and Edina, and are being planned to be input in the city of

Figure 15. Advisory lanes visualization

Another benefit of advisory bike lanes is that they tend to cause motorists to drive with more caution, which has been demonstrated where this lanes have been implemented. There are currently no laws or standards for advisory bike lanes mentioned in the US Department of Transportation Federal Highway Administration’s Manual on Uniform Traffic Control Devices.29

Existing data show that advisory lanes are safer than having cyclists travel in the roadway, as with shared lanes (Case 3). In Wiltshire County, England, where advisory bike lanes are common, there was a 35% decrease in motor vehicle crashes.30 On the same county roads the average speed of motor vehicles dropped 3 mph.31 Furthermore, in Suffolk County, England car use decreased from 5,600 per day to 4,500 per day and the number of cyclists using the road increased from 150 per day to 183 per day with the installment of the advisory bike lanes.32 This type of bike lane has the effect of reducing motorists’ and increasing cyclists’ use of the road. Two cities in the United States have implemented advisory lanes: Minneapolis and Edina, Minnesota. Initial responses to these lanes were mixed, because drivers in this city were confused by this new type of bike lane due to a lack of familiarity. However, there has only been once accident on these roads in the city of Edina. The advisory lanes in Edina are part of a two year study that will reveal much more information on their effectiveness in increasing bikeability and safety.33

32 Association of Pedestrian and Bicycle Professionals
Advisory bike lanes are our primary recommendation for Sections Two, Three, and Four of our route, where the 24 feet wide road is too narrow for separate lanes and cannot be expanded due to various roadside obstacles and residences along the route. The route has very little auto traffic, but it connects highly used destinations along a bikeable distance, making it prime candidate for experimenting with advisory lanes.

**ii. ADA Accessibility**

Because our project modifies and may increase access to public amenities in the surrounding areas, regulations designed to improve accessibility for disabled persons and pedestrians may be applicable to the project. Specifically, the Rehabilitation Act of 1973 (Section 504) (29 U.S.C. §794) and Title II of the Americans with Disabilities Act of 1990 (ADA)) require that public “rights of way” be accessible to pedestrians with or without disabilities. This simply means that any modification to roadways and pedestrian trafficked areas should be designed to accommodated disabled pedestrians. Since the new road and the existing Walden area will be renovated, the sidewalks will be modified and erected with this concern in mind. As our design recommendations separate bicycle traffic from pedestrian traffic, our paths and lanes need not include considerations for disabled persons, but we are certain that the sidewalk infrastructure will adequately serve these needs.

**C. ENVIRONMENTAL CONCERNS**

**i. Wetland Concerns**

According to the regulations of the Wetlands Protection Act (WPA), any construction in a wetland or riparian zone requires the submittal of a Request for Determination of Applicability

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(RDA) to the Conservation Commission. An RDA should include a plan of the proposed project, as well as planned measures the applicant will take to protect the wetland. If the Conservation Commission deems the project likely to impact the wetland, the applicant must then submit a Notice of Intent (NOI). A NOI usually requires the assistance of a civil engineer and a wetlands consultant to understand all aspects of the project and to consider all requirements of the WPA. The Commission then arranges a public hearing and must issue its decision within 21 days.

Figure 16: Christmas Brook riparian boundaries and wetland areas around Section Three and Four

36 Massachusetts Executive Office of Energy and Environment.
Traditionally, riparian buffer zones in Massachusetts are delineated at 100 feet from a wetland resource areas and 200 feet from a river or perennial stream. The regulation of construction within these zones, however, is left to the towns though the authority of the Conservation Commission.\textsuperscript{37} Our proposed bike path avoids wetland boundaries until it reaches Spring Street, at which point it nears Christmas Brook and crosses a riparian zone into a into a wetland boundary. However, we are confident that this will not present a problem.\textsuperscript{38} Based on limited spaces to extend Latham Street on either side as it crosses the Christmas Brook Culvert, our only course of action is to work on the street with paint. Therefore, our addition of advisory lanes would not modify the existing layout of Latham Street structure, and the fact that it crosses a riparian zone is not a problem for us.

For Section Three we can avoid entering a riparian zone if we remain above the southern edge of the parking lot. If, however, the bike path were to cross into the wetland area below the Spring Street parking lot, we would likely need to file a Notice of Intent with the Conservation Commission.\textsuperscript{39}

\textit{ii. Impermeability Concerns}

The issue of increased impervious surfaces is an important environmental concern of any construction project. Impervious surfaces present a threat to surface water resources because they increase runoff and decrease the filtering of pollutants which permeable surfaces (natural soils, gardens, sands, etc.) provide. The EPA cites six specific threats to surface waters (i.e. streams

\textsuperscript{38} Interview with Andrew Groff, Appendix B
\textsuperscript{39} ibid
and rivers) that are likely to arise as a result of this additional runoff. These are: 1) Changes in the natural hydrology of the river, resulting in larger, shorter duration, and more frequent flows; 2) Changes in channel morphology, such as increases in channel width and reductions in bank stability; 3) Altering of in-stream hydraulics (water velocity); 4) Disruption of balance between sediment supply and transport (more sediment transport, more channel erosion); 5) Increase in stream temperatures, due to heat heat transfer from the impervious surface to stormwater runoff; and 6) Increase in delivery of pollutants from land to water. These pollutants often include: sediment, nutrients, pesticides, wear metals, organic pollutants, oil and grease.\textsuperscript{40}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{diagram.png}
\caption{The negative impact on infiltration/hydrologic flow in watersheds (an important means of filtering pollutants and sediments) caused by impervious surfaces. Note the large increase in stormwater runoff as imperviousness increases, at the expense of infiltration. \textsuperscript{41}}
\end{figure}

\textsuperscript{40} Environmental Protection Agency, “Stormwater Runoff and Impervious Surfaces,” EPA, 2015, http://www3.epa.gov/caddis/ssr_urb_is1.html

Massachusetts municipalities attempt to mitigate the issue presented by impervious surfaces by developing resources to deal with stormwater runoff, the principal means by which pollution and sediments enter surface water sources. Two hundred Massachusetts towns observe the regulations established under the U.S. EPA's NPDES Municipal Separate Storm Sewer Systems Permit (the MS4 Permit) for the discharge of stormwater.\textsuperscript{42} The permit lasts for five years, is issued jointly by EPA and MassDEP, and requires towns to meet six minimum control measures.\textsuperscript{43} Williamstown, however, is too rural a town to require MS4 Permits.\textsuperscript{44} Although construction projects such as this are advised to follow the MassDEP stormwater manual suggestions, we face no specific requirements because we have concluded that our project will not need state funding because it is mostly on a college campus and is quite small in scope.\textsuperscript{45} We are not under MassDOT obligations.\textsuperscript{46} Furthermore, impermeability is unlikely to be a significant problem for us because the bike path is such a small project, and would not add a significant amount of impermeable surface.\textsuperscript{47} In the interest of mitigating the increase of impermeable surface, however, we will explore measures such as banking the bike path or installing rain gardens.

\textit{iii. Endangered Species Concerns}

The only other environmental law we must consider in our bike path plan is the Endangered Species Act. After checking the MassGIS website and the Oliver mapping program for priority and estimated habitats of endangered wildlife, we found that no proposed route of the

\textsuperscript{43} Mass.gov, Office Energy and Environmental Affairs, 2015.
\textsuperscript{44} Interview with Andrew Groff, Appendix B.
\textsuperscript{45} ibid
\textsuperscript{46} ibid
\textsuperscript{47} ibid
bike path would pass through an endangered species zone.\textsuperscript{48} This means that we do not need to communicate with MEPA, and we do not need to consider the ESA in our planning.

**D. ECONOMIC CONCERNS**

The Pedestrian and Bicycle Information Center collected extensive data on bike path costs in towns and cities across the country. According to their calculation, bike paths demonstrate an enormous range in costs, from $5,000 to $535,000 per mile, with an average cost of around $130,000 per mile.\textsuperscript{49} The entire length of our bike path route is approximately 0.5 miles. If we calculate from average cost we should expect to pay $65,000 for the bike path. However, since Sections Two, Three, and Four of our path are to take the form of painted lanes on existing roads the expected cost is much lower. For 0.39 miles (72\%) of the planned route, the costs of implementing our path consists of only design, paint, and labor. Section One is the only portion of our route that will require construction, and this is already accounted for in the budgeting for the new road.

The new road for Section Four of our project measures approximately 0.15 miles, or 30\% of our bike route.\textsuperscript{50} The entire road project, consisting of 1,000 linear feet, is expected to cost $1.6 million, including costs for DOT specs, the sidewalk, lighting, sewer, and stormwater considerations.\textsuperscript{51} Furthermore, because this is already a planned project and cost by Williams College Facilities, this section should not be calculated along with the costs for the remainder of our planned bike path.

\textsuperscript{50} Interview with Rita Coppola-Wallace, Appendix B.
\textsuperscript{51} Interview with Craig Wilbur, Appendix B.
One area in which we will need to take significant costs into account in our choice of routes and path types is the case of obstacles along the route. It is particularly useful to consider the costs of proposing an off-road bike path for Section Two or widening the road for separate accommodation lanes. While Sections Three and Four are physically limited to on-road lanes, there is enough roadside space along Section Two to theoretically allow an off-road bike path, if several obstacles were dealt with. Section Two consists of 0.14 miles, or 28% of the route, and follows the general route of Walden Street. However, any construction outside of the road footprint would be very expensive because of significant obstacles along the route. Section Two is bordered on the south side by two large telephone poles supported by large kick braces, and by an underground water retention structure. We could remove the poles, which are under the purview of Verizon, but Verizon would charge $20,000 per pole. Furthermore, if the poles are moved Williams would need to pay National Grid and Time Warner Cable as well, bringing the cost well above $20,000. This is because while Verizon would move the pole, National Grid would move their power lines, Time Warner would move their power lines, and each would charge separately for each action. Additionally, it would take 7 months to have the poles moved. Another option would be to remove the kick braces, but even if Verizon agreed to do so, its removal team would charge $10,000. Ultimately, however, it is important to note that we plan to avoid these costs by recommending advisory lanes, rather than an off-road bike path, for Section Two.

We do not know the exact costs concerning the water retention facility, which lies 8 feet south of Walden Street, but if we put a paved path over this structure we would need to seek

52 ibid
53 ibid
54 ibid
permission from Jason Moran, Senior Project Manager for Williams College Facilities. We would also need to consider how surface pitch would impact sediment control along the path.\textsuperscript{55} Furthermore, it is likely that Jason would conclude that construction over this structure is unwise, because the weight of construction vehicles could cause the structure to collapse.\textsuperscript{56} Overall, such considerations may also correspond with additional costs.

It should also be noted that there is a possibility that in the next five years or more, the east side Walden Street in its current form be replaced with a section of Latham Street, which will circle the current site of the Spring Street parking lot and reconnect midway down the length of Walden. If this is to occur, Facilities expects to add a bike path to this section as well.\textsuperscript{57}

\textbf{E. TECHNICAL CONCERNS}

\textit{i. Bike Safety}

Based on information from ASSHTO/MassDOT (discussed in the design section above), an off-road path appears to be the preferable choice for accessibility\textsuperscript{58}, though the presence of sidewalks renders this unnecessary. To maximize accessibility for pedestrians and cyclists, it is generally inadvisable to alternate between separate paths and bike lanes, as this may require awkward street crossings by cyclists. For example, lanes on Walden Street connecting to a separate off-road path by the Health Center would force bicyclist to cross at an already potentially complicated intersection. Unfortunately, this design option may be necessary at the Latham and Spring Street intersection. Another important consideration is Spring Street Parking

\textsuperscript{55} Ibid
\textsuperscript{56} Shaun Garvey.
\textsuperscript{57} Interview with Rita Coppola-Wallace, Appendix B.
Lot, where cars entering and exiting the lot may impede cyclist access to bike lanes or bike paths.

**ii. Road Widths**

Another technical concern for our project is road widths limiting the possible types of bike paths. As previously stated, the width of Latham Street (Section Four) of the road is only 24 feet not including parking, with little space to widen the road on either side. This prohibits the installation of separate or partially shared bike lanes on this road. Walden Street (Section Two) is also 24 feet wide, and is projected to become a two-way road with no parking within the next year to accommodate construction on campus.\(^5^9\) Adding separate on-road bike lanes will therefore be impossible unless the road is widened. As detailed in previous sections, Walden Street is further constrained by the telephone poles, as well as an underground water retention structure located 8 feet south of Walden. However, space constraints offer some positives. When roads are narrowed for bike paths, usually from the standard 12 to 10 feet wide, these narrower roads are statistically safer as drivers perceive a necessity to slow down.\(^6^0\)

We have the least constraint in the case of the new the road connecting Hoxsey Street to South Street (Section One), planned to be 36-38 feet in width, allowing separate accommodations for cyclists and motorists. The bottom section of Spring Street that curves into Latham Street is already two-way and measures 36.5 feet. While we have space to work with at this section of the path, we are constrained by parking on either side of the road. Finally, the upper section of Spring Street proper measures approximately 37 feet; being a one-way street, it would leave plenty of room for a 5 feet wide counterflow lane.

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\(^{5^9}\) Interviews with Rita Coppola-Wallace and Craig Wilbur, Appendix B.

\(^{6^0}\) B. Lindeke, “Two Anti-Bike Lane Narratives That Need to Stop,” BeyondChron, October 29, 2015, http://www.beyondchron.org/two-anti-bike-lane-narratives-that-need-to-stop/
iii. Material Considerations

Physical design considerations include path barriers, the pathway surface material and path curvature. A barrier is often desirable between a shared use path and a roadway to differentiate the two spaces and indicate that the path is an independent facility. However, this could potentially obstruct bicyclists or pedestrians who want to access a facility or driveway across the street, unless the barrier accommodates that opening. Speed design is also a consideration; paths should accommodate the preferred speed of faster bicyclists at 20 mph. Another consideration is whether the path should be paved or unpaved. Bicyclists are more likely to skid on unpaved surfaces, or surfaces that do not adequately allow for stormwater runoff, but paved surfaces may not adequately allow for drainage into the soil and thus exacerbate impermeability issues. Paving design is an issue of friction and the impacts of climate on the path, such as rainfall, which may affect cyclist speeds and traction.

Turn radius and width further impact friction and speed design. Turn radii must accommodate average pedal heights of bikes, as a bicycle must lean in to make a turn. If the turn is too sharp, the bicycle pedals will scrape the ground. However, sharper turns would also force the bicyclist to slow down and move at safer speeds. Turns must be wide enough that cyclists can see adequately around corners and over the top of a hill crest, allowing them to stop in time if there is an obstruction and have enough time to make directional decisions. Some sections, such as the slope near the Health Center, may require modified gradients to account both for the mechanics of bicycling and for sight design. For the most part, however, our route will be relatively flat.
F. OVERVIEW OF BIKE PATH BENEFITS

i. Environmental Benefits

The addition of a bike path in a residential and commercial area between South Street and Latham Street, including the south end of Williams College campus and a significant area of Spring Street, the downtown area of Williamstown, offers the obvious environmental benefit of decreasing local emissions rates by encouraging biking in place of car travel. The organization “People for Bikes” cites varied statistics on the benefits of bike traffic on their website.61 For instance, a 2006 study published in the Journal of the American Planning Association found that a 5% increase in a neighborhood’s walkability has been demonstrated to correspond with is a 32.1% per capita increase in active travel, a 6.5% decrease in miles driven, a 5.6% decrease in grams of NOx emitted, and 5.5% decrease in grams of volatile organic compounds (VOCs) emitted.62 The Rails to Trails Conservancy, meanwhile, released a study in 2008 which predicted that increasing the percent of all trips made in the U.S. by bicycling and walking from 12% to 15% could lead to fuel savings of 3.8 billion gallons a year, and reduce greenhouse gas emissions by 33 million tons per year; the equivalent of replacing 19 million conventional cars with hybrids.63

Finally, from a more Williams-specific standpoint, we are hopeful that such projects as the bike path can be adopted as part of the larger environmental initiative introduced by president Falk, for which $50 million have reportedly been earmarked. Improving the bikeability of the

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62 L. Frank et al., “Many pathways from land use to health: Associations between neighborhood walkability and active transportation, body mass index, and air quality”, Journal of the American Planning Association, 72, 2006, 75-8.
William College campus will also help the College achieve its emissions goals, and help Williamstown achieve its “green community” aims.

**ii. Health and Safety Benefits**

Encouraging biking in place of driving has a strong positive environmental impact. Additionally, bike paths and lanes offers more immediate benefits to cyclists as well. Bike path infrastructure has been demonstrated to improve health, decrease traffic accidents and improve safety for cyclists. A 2009 article published in the UK medical journal *The Lancet* states that “reducing carbon dioxide emissions through an increase in biking and walking as a share of transportation offers significant health benefits for a given population, and reports that an increase in active transportation is estimated to reduce 500 fatalities per million inhabitants in cities such as Delhi and London.” Furthermore, Davis, California boasts over 50 miles of on-street bike lanes and over 50 miles of off-street bike paths, and exhibits one of the lowest vehicle miles travelled per capita for a U.S. city, at about half the U.S. average. Davis also experiences very low traffic fatality rates: approximately 2.5 deaths per 100,000 residents, \(\frac{1}{4}\) of the U.S. average.

With the addition of a campus bike path cyclist safety will become a focus as more of the student body begins to bike. Bike safety has emerged as a national issue as cycling has become more popular. Nationally, from 1998 to 2013 the number of reported injuries resulting from biking rose 28%, and the number of resulting hospitalizations increased 120%. In 2012 alone,

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66 ibid
726 bicyclists were killed, and the majority of these deaths were children.\textsuperscript{68} According to a report by the National Cooperative Highway Research Program, 57.5\% of bicycle crashes occurred as a result of motorists and cyclists crossing paths, and another 35.5\% resulted from parallel paths of cyclists and motorists. In path crossing accidents, the largest number of crashes were caused by cyclists and/or motorists failing to yield to one another at intersections. In parallel path crashes, the largest number of accidents were caused by motorists merging into a bicyclist path.\textsuperscript{69}

Road safety is an issue that affects the Williams College Campus as well. From 2011 to 2015 there have been seven bike accidents reported to Williams College Safety and Security, all of which resulted in the cyclists receiving some sort of medical attention.\textsuperscript{70} Furthermore, cyclists have noticed the danger: 19\% of the our survey respondents who cycled felt unsafe biking around campus\textsuperscript{71}. In order to ensure a safe cycling population on campus, there needs to be a focus on implementing a path that clearly signals the shared roadway to cyclists and motorists. Especially since Williams College has seen a large increase in cyclists in recent years; half of the 1,451 bikes registered since 1993 were registered within the last four years.\textsuperscript{72}

Currently most cyclists use pedestrian paths to get around campus. 25.4\% of current cyclists reported feeling at least “somewhat unsafe” biking on campus paths. As pedestrians, only 12.1\% of respondents felt positively about sharing sidewalks with cyclists. Nearly half (49.1\%) were neutral, and 28.9\% responded negatively.\textsuperscript{73} This matter was frequently addressed

\textsuperscript{70} Interview with David Boyer.
\textsuperscript{71} Survey, Appendix A
\textsuperscript{72} Interview with David Boyer.
\textsuperscript{73} ibid
in the comments with suggestions for separate paths, wider sidewalks, and raising awareness of safe bicycling practices. Indeed, biking on sidewalks is illegal in most areas of the country, and cyclists are advised to follow the same rules of the road as are motor vehicles. One respondent to our survey commented: “It leaves me very uncomfortable cycling on what I know to be pedestrian ‘territory.’” This was a common theme amongst respondents; many expressed unease about the campus paths as shared use. One stated, “Campus paths should be wide enough to accommodate pedestrians and bicyclists safely—not all of them are.” Others expressed the need for “ample warning signs that bikes and pedestrians are mixing” and “[established] rules or guideline[s] for biking and walking on campus paths.” An interesting point brought up was that “with the prevalent use of headphones these days, it has gotten more dangerous for people to ride bikes on pedestrian walkways since the headphone wearer may not hear a bike from behind.”

Cyclists also expressed discomfort with biking on the roads in and around campus. One person commented, “I feel it is unsafe to ride bikes on Spring street, Rt 2 and Park St/Syndicate Road.” Only 51.3% of cyclists reported feeling at least “somewhat safe” going up Spring Street. 

Drivers who frequently use Route 2 and Syndicate Road also expressed concerns about on-street biking. One survey respondent stated, “I am always worried a car will pull out without seeing me.” Other commenters demonstrated interest in designated, well-lit bike lanes or paths. One person specifically mentioned our idea for a counterflow Spring Street lane: “Spring Street should have a bike lane going *up* the street. This arrangement where a street is one way but wide enough for a bike lane in the counter direction is perfectly common in cities like Geneva.”

\footnote{ibid}
In order to ensure safety, the first step is to properly educate bicyclists on how to safely navigate bike paths and roadways. In Europe, a much safer region for bicycling, education on biking culture begins at a young age, allowing children to integrate safe biking habits into their lifestyle before they reach a college campus. The lack of this education and prominent biking culture in our society is evident by not only accident statistics, but by how our legal institutions deal with these accidents. More often than not drivers who hit cyclists are simply given a ticket, and not charged with any sort of crime, even though according to the law cyclists have just as much right to the road as motor vehicles do. With the installation of a bike path we would hope to see more cyclists on campus, which can increase driver awareness and thus cyclist safety.\textsuperscript{75}

Educating drivers and cyclists in the area, many of which are not students at Williams, is a difficult goal. This is why the implementation of our designed bike route is extremely important to increase both pedestrian and cyclists safety in the area. Understanding that our country as a whole is largely uneducated on bike safety, and implementing a design that increases informational signage around roads will increase the safety of cyclists, pedestrians, and motorists all navigating the same roads.

\textit{iii. Economic Benefits}

Decreasing car travel also provides financial savings to residents.\textsuperscript{76} Beyond the savings on car maintenance and fuel, bike infrastructure offers a significant economic benefit to cities and college campuses. Burlington Vermont offers a good example of this. After Burlington undertook a large project to increase bike infrastructure, the city saw bicycle and pedestrian activities contribute $82.7 million in output.\textsuperscript{77} Discounting jobs in infrastructure construction,

\begin{flushleft}
\textsuperscript{75} J. Brody. \\
\textsuperscript{76} ibid \\
\end{flushleft}
bik and pedestrian events and businesses alone contributed around $66 million to Burlington.\textsuperscript{78} In the words of Vermont Deputy Director of Transportation Sue Minter: “Communities that have better pedestrian environments often have an economic stimulus. They are places where people want to live and places with retail establishments where people want to shop.” According to Minter, many more Vermont communities “are really excited about expanding their bicycle and pedestrian networks.”\textsuperscript{79} On a smaller scale, we hope to see the same benefits in Williamstown as we continue to improve bike infrastructure and connect with the Ashuwillticook trail users.

Bike paths also provide financial benefits to Williams students. For instance, bike path infrastructure will encourage students to bike more and drive less. By proposing this bike path we hope students will switch from driving to biking because of the increased convenience, and they will realize the economic benefits. The average cost of owning and maintaining a car is about $0.58 a mile in the United States in 2015. Assuming an American drives the average 15,000 miles a year, this results in a yearly cost of $8,698.\textsuperscript{80} However, there are many assumptions that will reduce this cost for a college student owning a car on campus. First, because Williams College does not constitute a true commute for most students a Williams, it is safe to assume that students will drive fewer miles. Furthermore, many parents of students will cover a variety of the miscellaneous costs of the car such as insurance and maintenance. Yet most students are responsible for paying for gas for the car while they use it. However, fuel costs

\textsuperscript{78} ibid.
\textsuperscript{79} ibid.
are estimated to be $0.112 a mile.\textsuperscript{81} Therefore, even if students only drive a third of the average American and only paid for gas, they would still incur a cost of about $560 per year.

With or without the implementation of this bike path, the cost to own a bike at Williams College is extremely cheap. First, the Purple Bike Coalition offers a free bike repair and rental service to students, which is significantly more cost effective than driving.\textsuperscript{82} Even if a student were to buy and maintain their own bike, costs would remain relatively low. An average used bicycle can be purchased for about $150-$200, and maintenance for the bike costs around $100.\textsuperscript{83} Therefore, this average cost of $300 for purchase and maintenance of a bike is still less than a college student only paying for gas at school.

Creating momentum to encourage biking for short trips, which occur frequently in both college campuses and cities is economically valuable. On a larger scale, switching to cycling can have large savings for society as a whole. A study done by the University of California Davis estimated that if city dwellers around the world used bicycles for only 10% of their urban trips, the reduction in greenhouse gas emissions would save society an immense amount of money in infrastructure and other costs.\textsuperscript{84} As Williams College strives to become more environmentally conscious and fiscally responsible, the creation of bike path infrastructure is a great way to signal this.

\textsuperscript{82} Purple Bike Coalition, http://sites.williams.edu/bikes/.
IV. PROPOSED BIKE PATH

A. MATRIX EVALUATION

In our design we looked at a variety of path and route options for each of the four sections. Options were evaluated on the basis of six variables, with a score of 1 to 5 assigned in each category. Each route option was given a total score for each section, with the lowest score indicating the most desirable option. We highlighted the best on-road and off-road option (when both were possible) in each section so that both possibilities could be considered, as continuity of path type is essential for connecting the path and ensuring navigation clarity and safety for bikers and drivers.

Matrix Variables

1. **Cost:** How expensive would this design be to the college/town (1 least expensive - 5 most expensive)

2. **Feasibility:** How difficult it would be to implement this design, considering construction plans and various obstacles (1 easiest - 5 hardest)

3. **Environmental Impact:** What is the impact on the environment of this design, considering impermeability, wetland protection, endangered species, etc. (1 least impact - 5 most impact)

4. **Safety:** To what extent does this design pose dangers to cyclists, pedestrians, and motorists (1 least dangerous - 5 most dangerous)

5. **Desirability:** How well does the design serve the comfort of users (1 most desirable - 5 least desirable/accessible)

6. **Accessibility:** How well does the route serve the needs of users in providing connectivity to popular destinations (1 most access - 5 least access)
**i. Evaluation: Section One**

The new road will connect Hoxsey Street to South Street, passing in between the Health Center, the Class of ’82 house across from the Health Center, Stetson Court, and Agard House (Figure 17). The road is certain to be built before work on the new Science Center begins in order to facilitate traffic into the Walden-Hoxsey area, and the design is already planned to accommodate cyclists with separate bike lanes\(^{85}\). This planned road extension is partially due to the fact that Hoxsey Street residents are opposed to the increased construction traffic up and down the street, that would be likely occur without a new road\(^{86}\).

![Figure 18: Option A and C are the most preferred routes for Section One, based on lower relative scores and connectivity to options in the next section.\(^{87}\)](image)

**Obstacles: Class of ‘82 House and Brooks Parking Lot**

\(^{85}\) Interviews with Rita Coppola-Wallace and Craig Wilbur, Appendix B.

\(^{86}\) Interview with Craig Wilbur, Appendix B.

\(^{87}\) [http://www.williams.edu/map](http://www.williams.edu/map).
The main obstacle along the route appears to be the Class of ’82 house, which is a private house owned by Williams College alumni. Because this property is the only obstacle in the way of directly connecting Walden Street with a straight connecting route to South Street, the house may need to be bought and moved. Otherwise, the route may include a bend in order to avoid the house, since it would be expensive and take up to a year and a half to account for the process of acquiring and moving the house. The only other potential obstacle is the Brooks Parking Lot; if the road went through the Class of ’82 House, it would also take away parking space from the lot. The ultimate design of the road may determine the exact placement of the bike path, especially if the path is on-road.

**Design**

Four design options present themselves (Figures 17-20). On-road, we could have 4-5 feet one-way bike lanes on either side of the road or one 8-10 feet wide two-way lane on one side of the road. As an off-road path, we have route options of alongside the new road or south of Agard House. As a pedestrian sidewalk will be present in every design option, any considerations for pedestrian travel are largely irrelevant to bike path considerations, though a shared mixed-use separate path may be a consideration in lieu of a bike-only separate path. Once again, the estimated preliminary cost for the New Road including plans for bike lanes is $1.6 million.

**Figures 19-22**

**Option A:**
One-way separate bike lanes

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Interview with Craig Wilbur, Appendix B.

Massachusetts Department of Transportation. “Separated Bike Lane Planning and Design Guide.” 2015. 
https://www.massdot.state.ma.us/Portals/8/docs/designGuide/CH_11_a.pdf
Option B:
Two-way bike lane on one side

Option C:
Separate bike path next to road

Option D:
Separate bike path behind Agard

Matrix: Section One

<table>
<thead>
<tr>
<th></th>
<th>On-road Options</th>
<th>Off-road Options</th>
<th>No Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td>One-way, on-road lanes on either side of road (Separate Accommodation)</td>
<td>Option B Two-way lane on one side of road (Separate Accommodation)</td>
<td>Option C Separate bike path along New Walden</td>
</tr>
<tr>
<td>Cost</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Feasibility</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
Table 2. Evaluation Matrix for Section One

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<th>2</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental Impact</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Safety</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Desirability</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Accessibility</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>11</td>
<td>14</td>
<td>18</td>
<td>22</td>
</tr>
</tbody>
</table>
Figure 23: Option C and Option E represent the most preferred routes for Section Two, based on lower scores and connectivity to the other sections.

Obstacles: Water Retention Facility and Power Lines

A water retention structure, demarcated in light pink in Figure 22, constrains the possibilities for a separate bike path alongside Walden Street, which would otherwise be the most desirable and safe option. As such, on-road designated lanes are more feasible. A separate bike path next to Walden or a widening of the road itself is much more expensive than the other options, as the proximity of power lines and their towers would require payment to utility and service companies for their movement in addition to the cost of the width expansion.

Design:

Option A is the creation of separate bike lanes, which would require a road widening. The narrowness of the Walden Street forces us to look at other design options. Option B is the implementation of shared use lanes where both bikes and cars use the same lanes of travel with painted markings on the pavement to indicate shared space. Option C is the installation of advisory lanes, which would eliminate the median line and create designated bike lanes on either side of the road. Option D is an off-road path alongside Walden Street. Option E is an off-road path south of Doughty House.

Figures 24-25

Option B:
Shared use
Option C: Advisory lanes

Matrix: Section Two

<table>
<thead>
<tr>
<th></th>
<th>on-road Options</th>
<th>off-road Options</th>
<th>No Path</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Option A</strong></td>
<td>One-way, on-road lanes on either side of road</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Option B</strong></td>
<td>Shared use lanes with on-road painted indicators</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Option C</strong></td>
<td>No Median Line Advisory Bike Lanes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Option D</strong></td>
<td>Separate bike path along Walden route</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Option E</strong></td>
<td>Separate bike path behind Doughty</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Option F</strong></td>
<td>No bike lane or path</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Cost   | 5 | 1 | 1 | 5 | 3 | 1 |
| Feasibility | 3 | 1 | 1 | 4 | 3 | 1 |
| Environmental Impact | 2 | 1 | 1 | 3 | 3 | 1 |
| Safety | 2 | 3 | 2 | 1 | 1 | 5 |
| Desirability | 2 | 3 | 2 | 1 | 2 | 5 |
| Accessibility | 1 | 2 | 1 | 1 | 3 | 5 |
| Total | 15 | 10 | 8 | 15 | 14 | 18 |

Table 3. Evaluation Matrix for Section Two

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90 https://www.djc.com/stories/images/20130905/AdvisoryBikeLanesDraft_big.jpg
iii. Evaluation: Section Three

This section navigates the intersections of Walden Street, Spring Street, and Latham Street. For the section there are two highly contentious projected construction variables, both designated in Figure 26 below: 1) a potential extension of Latham Street wrapping underneath the parking lot to connect to Walden Street (dotted white line), and 2) the placement of the new inn at the bottom of Spring Street (area in yellow). Neither of these developments is set in stone. As such, we must propose this section keeping in mind that the placement of these projects may significantly affect the bike path design.

Figure 26: Option C and E are the most preferred routes for Section Three, receiving the lowest relative matrix scores and best connectivity to the other sections. White hash marks designate a potential Latham Street extension. The yellow circle highlights the rough boundaries of the new hotel property.

Obstacles: The Parking Lot

Other than the power line considerations continuing from the previous section, the main obstacle is the parking lot at the bottom of Spring Street across from Tunnel City. If we choose
designated on-road lanes, the bike path may simply continue onto Spring Street and turn towards Latham. If there is a separate path, it may wrap around the bottom of the parking lot or go directly through the middle of it. As this area is a highly trafficked intersection, the option that maximizes safety and creates the simplest connection between the sections is the best option.

**Design:**

The design options in this section are similar to the options of the previous section. The main distinction is between Options D and E, which represent different separate-path alternatives for navigating the parking lot. Neither of these options are feasible if the new Williamstown hotel is placed on the east side of the parking lot; a possible alternative if this occurs might be to continue the separated path further south of the Inn and Parking lot to connect straight onto Latham Street. As this is extremely unpredictable, we did not include such an option in our matrix. If Latham Street were extended, the most likely option would be to continue on-road advisory lanes on either side, but again this option was not formally considered due to high uncertainty. Option A received a feasibility score of 2 in the matrix because it would eliminate on-street parking from Spring Street. In this case, we again chose advisory lanes (Option C) as the best choice.

**Matrix: Section Three**

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<thead>
<tr>
<th></th>
<th>on-road Options</th>
<th>off-road Options</th>
<th>No Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td>One-way, on-road lanes on either side of road</td>
<td>Option B Shared use lanes with on-road painted indicators</td>
<td>Option C No Median Line Advisory Bike Lanes</td>
</tr>
<tr>
<td>Cost</td>
<td>2</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

49
### iv. Evaluation: Section Four

The narrowness of Latham Street, abutted by private properties closer to Water Street, constrains our options to on-road lanes. Here we evaluated shared use lanes and advisory lanes. Ultimately, due to safety and desirability considerations, we found advisory lanes to be the best choice.

**Figure 27:** Option B, advisory lanes is the most preferred choice for Section Four.

#### Matrix: Section Four

<table>
<thead>
<tr>
<th>on-road Options</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Option A</td>
<td><strong>Option B</strong></td>
</tr>
<tr>
<td><em>Shared use lanes with</em></td>
<td><em>No Median Line</em></td>
</tr>
<tr>
<td>Option C</td>
<td><em>No bike lane or</em></td>
</tr>
</tbody>
</table>

Table 4. Evaluation Matrix for Section Three
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<tr>
<th></th>
<th>on-road painted indicators</th>
<th>Advisory Bike Lanes</th>
<th>path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Feasibility</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Environmental Impact</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Safety</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Desirability</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Accessibility</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>10</td>
<td>8</td>
<td>18</td>
</tr>
</tbody>
</table>

Table 5. Evaluation Matrix for Section Four

Summary:

<table>
<thead>
<tr>
<th></th>
<th>Best On-Road Route</th>
<th>Best Off-Road Route</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score</td>
<td>28</td>
<td>41</td>
</tr>
</tbody>
</table>

Table 6. Matrix sum for best on-road and off-road routes

Overall, the on-road preferred route scored better than the off-road preferred route. This route would consist of one-way bike lanes on either side of Walden Street in Section One, and advisory lanes throughout Sections Two, Three, and Four. We can therefore make the official proposal as follows: Section One: “Case 1: Separate Accommodation for All Users”, Section Two: “Advisory Bike Lanes”, Section Three: “Advisory Bike Lanes”, Section Four: “Advisory Bike Lanes”. Advisory lanes are strongly preferred against shared use lanes due to safety and desirability considerations in our matrix. We also favor this proposal because it eases the transition for cyclists between sections.
Figure 28: Best on-road and off-road routes according to our matrices. The on-road combination of designated bike lanes and painted advisory lanes is the more preferred option.

B. ADDITIONAL RECOMMENDATIONS

Additional recommendations for the proposed route and general campus and Williamstown bikeability include an Option B on-road lane proposal, an alternative off-road path proposal, further biking amenities and infrastructure, and recommendations to address safety concerns.

Option B: Shared Bicycle/Motor Vehicle Lanes for Section Two, Three, and Four

Major cost and feasibility evaluation matrix factors led us to suggest an on-road option for Sections Two, Three, and Four of our bike route. Due to space constraints and safety factors, we then concluded that our two options for these sections were “shared bicycle motor vehicle on-road lanes” and “advisory lanes”. We ultimately found, after considering safety and desirability factors, as well as the data gathered from our survey responses, that advisory lanes were preferable to shared bicycle/motor vehicle on-road lanes. We are aware, however, that
despite their demonstrated success elsewhere advisory lanes are largely an unfamiliar approach. Although we hope that Williams College and the Williamstown community will choose to implement this strategy in the event that subsequent planners are reluctant to implement advisory lanes we offer an Option B on-road solution. We strongly advise against choosing to implement no bike path at all, therefore, we suggest that in the event advisory lanes are rejected as an option for Sections Two, Three, and Four, Williams College and the Williamstown community choose Option B: shared use bicycle/motor vehicle on-road lanes, for these sections. Under Option B, Section One would remain with the same plan of shared accommodation for all users, and the design of Sections Two, Three, and Four would change from advisory lanes to shared bicycle/motor vehicle lanes. These lanes are not as safe nor as desirable for a cyclist, but they have been demonstrated elsewhere (notably in San Francisco) to increase safe cycling and driving behavior beyond that which is practiced in the absence of any bicycle markings.

Alternative Option: An Off-Road Path

Although our evaluation matrix indicates that on-road lanes are the best fit solution, we would like to discuss the next-best option, a combination of a separate bike path and on-road suggestions on Latham. This option scores extremely high for desirability and safety, and is the option most likely to optimize user benefits. However, there are significant constraints to the actual implementation of a separate-use path, which ideally would fall alongside the road of the new road and continue side by side with Walden Street. Because of the high costs of working with utilities along Walden Street to move utility poles for a separate path space, financing such a project is a significant barrier to implementation. Secondly, the large water retention structure next to the parking lot represents a significant physical obstacle that would require special
permissions in additions to large costs to work around. An alternative route for Section Two would be to direct the path behind Dowdy House; however, this concerningly would take student traffic in the opposite direction of most desired destinations, and would not effectively fulfill the current need for direct, accessible routes connecting points of interest. As such, we feel that though a separate path might be ideal, it is not advisable in this case unless Williams College is willing to take on the cost and complications of building on off-road path along the Walden Street route.

Spring Street Contraflow Lane

On Spring Street there is a lack of designated bike lanes, which presents a large safety risk is Spring Street. Cyclists heading south and down the one-way street are able to safely move with the flow of the slow-moving traffic, but heading upwards and north requires dangerous maneuvering between the sidewalk and pedestrians and biking against motor traffic on the

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91 Alta Planning + Design, Williams College Bike and Pedestrian Master Plan
roadway. Because there is no designated area for cyclists, traveling north from the south end of campus is significantly impaired. The other options are to navigate the steep and difficult Morley Drive, the further away Hoxsey Street, and the even further away Water Street. To address this concern we suggest that a contraflow lane up the right side of the street (on the post office side) be demarcated. Such a lane will avoid in large part the hazard of parallel-parked car doors opening, as the driver-side exit will be facing the sidewalk. However, the spaces designated for delivery trucks would need to be enforced, as currently deliveries that take place outside of designated delivery zones would obstruct the flow of cyclist traffic. Such a lane would need to be clearly indicated with large, thick paint stripes, and strategically placed signage at the beginning and end of Spring Street to indicate the nature of the lane would be necessary. At the Route 2 intersection with Spring Street, a potential widening of the road on the right side of the Y would be advisable to allow cyclists to continue into the normal flow of traffic heading east.

We would also like to note that a contraflow lane on Spring Street could be adopted on a trial basis with limited costs or inconvenience to the College or town. Creating a contraflow lane requires nothing more than paint, and would not involve alteration of the roadway itself.

Campus and Williamstown Bicycle Infrastructure

Because cycling has so many potential benefits for the campus and surrounding community, we suggest that planners from the town and college make a concerted effort to collaborate on the bikeability of the area. Should a version of our proposed route be implemented, it will be important to connect this route to other biking trails nearby, such as the Ashuwillticook (via the proposed Mohawk Trail). This would require a critical look at Route 7, Syndicate Road, and the campus buildings and spaces in between and nearby; the narrowness
and low visibility especially along Syndicate road already suggests the need for improvements for cyclists in general. If the Ashuwillticook Trail and our route acted in tandem to draw many more cyclist tourism and activity into the area, important steps would be necessary to deal with the volume and increased safety risks. Moreover, our proposed route ends on Water Street, which is notoriously dangerous for pedestrians and cyclists to navigate alongside cars. A evaluation of Water Street roadside improvements should also be undertaken, particularly given the projected future expansion of residential and commercial capacity along the route.

An additional issue brought to light by our survey was the demand for bike storage on campus. 50% of bike users reported being unsatisfied with storage options on campus; further, 25.6% of non-cyclists listed storage concerns as a major reason for not having a bike on campus. Respondents raised concerns about bike racks for daily parking: “I find the lack of bike racks on campus extremely frustrating. Many buildings have no place to park a bike and others do but they are extremely overcrowded. I often have to end up locking my bike to handrails, stairs, street signs etc. For a campus that wants to be environmentally friendly and encourage biking this is a big problem.” Another major issue was “the lack of indoor/covered bike storage” in dorms for the winter. While bike storage does not fall directly within the scope of our client’s goals, the significant amount of demand demonstrates that storage addition and expansion could help increase biking on campus. Near the proposed bike route, we recommend day storage racks be installed. Likely points of high access/storage needs will be the Health Center and Spring Street, as these are the points of interest where cyclists will need to stop and secure their bikes to use nearby facilities. We also recommend that day storage and overnight storage be installed at

92 Survey, Appendix A.
Other key points on campus as suggested in the Williams College Bicycle and Pedestrian Master Plan.

Other considerations that we recommend are general separate cyclist paths, adequate signage (including both painted markings, stop or yield signs at all cyclist-motorist intersections, and bike lane indicator signs), and proper lighting. Many of surveyed students complained about general lack of knowledge about proper conduct for sharing pathways with cyclists. Moreover, the absence of both on-road paint markings and vertical signs in the surrounding community contributes to confusion about the proper spaces for cyclists.

**Bicycle Safety Education**

In order to address campus bike safety we are proposing that Williams College administer a bike safety education course to all Williams students during orientation. This would allow most users of our path to be aware of the potentially dangerous areas, and learn how to prepare to confront these situations safely. In addition, more general bike safety tips can be administered, such as wearing a helmet, wearing bright colors, installing lights and mirrors on bikes, signaling turns, making eye contact with drivers, and obeying all signs applicable. While educating all motorists in the area is a more difficult task as many are not Williams College students, with the installation of a bike path we expect to see more cyclists on campus, which in itself can increase driver awareness and thus biker safety.

**Advisory Lane Information**

From the few case studies of advisory lanes that exist in the United States, in particular the trial in Edina, Minnesota, we can see that one of the largest challenges confronting the implementation of advisory lanes is the unfamiliarity of drivers in the area in using this type of
roadway. We hope to meet this challenge this in various ways. First, educating the students of Williams College on how to use the road is relatively simple, and can be addressed in the bike safety meeting in which all students would attend. Educating residents of the town and tourists is a more difficult task, but several measures can be taken to do this. We plan to disseminate an informational pamphlet to various institutions in town such as Williamstown Town Hall, the Clark Art Museum, hotels, along the route at various points, and on Spring Street in order to familiarize residents and tourists with advisory lanes prior to implementation. Furthermore, leaving pamphlets local tourist attractions will make visitors aware of the unique roadway. Williamstown should also put ample signage on the road signifying to motorists and cyclists on how to use the advisory lanes. It is essential that all users of the roads along our route feel comfortable and familiar with advisory lanes prior to their construction.

We would also like to note that advisory lanes could be adopted on trial basis with limited cost or inconvenience to either the College or the town.

**Decreasing Speed Limit**

Based on evidence from communities that employ advisory lanes elsewhere, we expect drivers of motor vehicles to travel slower and more cautiously along our advisory lane routes regardless of the posted speed limit. In order to further encourage safe travel along the advisory lanes we suggest a speed limit of 15 to 20 mph through Sections Two, Three, and Four. This slowed travel will hardly inconvenience drivers, because Sections Two, Three, and Four stretch a distance only 0.39 miles. Also, few drivers are expected to use this route as a thoroughfare; and rather use it only to access destinations such as the Clark Art Museum, Spring Street or Water
Street. Furthermore, the town and College communities will benefit from slow and safe driving in this area.

**Trial Basis**

As previously stated, the implementation of advisory lanes simply consists of an adjustment of the paint on the road. As a result, advisory lanes are easy to implement on a trial basis at a relatively low cost. The same methodology goes for the contraflow lane on Spring Street.

**V. CONCLUSIONS**

There are several reasons why we chose to recommend the use of advisory bike lanes for Sections Two, Three, and Four of our bike path. First, this type of bike lane is ideal for roads that are narrow in width, and experience high volumes of bike traffic and lower volumes of motorist traffic. Furthermore, case studies of advisory lanes have shown a reduction in the number of motorist accidents, motorists per day, and an increase in the number of cyclists per day using the road once these lanes were implemented. All of these facts support the goal of our project to increase safe bikeability on Williams College and the surrounding area. Additionally, Sections Two, Three, and Four are well suited for advisory lanes as much of the roadway is space constrained, and we hope to encourage cycling and walking as an alternative to driving, as the route already has low motorist traffic. Finally, we also hope to encourage slow and careful driving for those motorists that do pass through this area. Any resultant inconvenience to drivers will be minimal because the entire stretch of advisory lane-marked road would be only 0.39 miles, and would be outweighed by the benefits to the community of slower and safer car travel.
In general, an east-west bike lane connecting the amenities of Spring Street to Williams College dorms and other facilities is crucial to the campus’ overall bikeability. By implementing our proposed route, we believe we can significantly impact the amount of cyclists on campus and in the greater Williamstown community. The environmental, economic, health, and accessibility benefits of a bike lane far outweigh the moderate costs of implementing our advised route. We also sincerely hope that Williams College and Williamstown community planners will seriously consider our further recommendations for improving bikeability within the area. We believe our approach is integral in planning a widely used campus bike path and improving bike safety on campus.
VI. APPENDIX

A. SURVEY AND RESULTS

“Do you care about biking and walking around campus? If so, please complete our survey. We are environmental planning students (Envi 302), who are working with facilities to plan new biking & walking paths on campus and in town. We are specifically evaluating new routes to connect Garfield House and Water Street, giving access to the health center, Weston Athletic Center, the new dorm on Stetson court (currently under construction), Hoxsey St., Spring St., and Latham St.

***3 survey respondents will be randomly selected to win $15 tunnel city gift certificates!***

Questions for general campus community:

Are you a

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>287</td>
<td>74.7%</td>
</tr>
<tr>
<td>Faculty Member</td>
<td>55</td>
<td>14.3%</td>
</tr>
<tr>
<td>Staff Member</td>
<td>38</td>
<td>9.9%</td>
</tr>
<tr>
<td>Community Member</td>
<td>4</td>
<td>1.1%</td>
</tr>
</tbody>
</table>

Do you currently own or rent a bike on campus?

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own</td>
<td>187</td>
<td>48.7%</td>
</tr>
<tr>
<td>Rent</td>
<td>19</td>
<td>4.9%</td>
</tr>
<tr>
<td>Neither</td>
<td>178</td>
<td>46.4%</td>
</tr>
</tbody>
</table>

If you don't own or rent a bike on campus, why? (Check all that apply)

- Not interested in cycling on campus: 63 (16.6%)
- Safety concerns: 26 (6.8%)
- Bike storage concerns: 45 (11.8%)
- It's too expensive: 27 (7.1%)
- N/A (I do own a bike): 188 (49.9%)
- Other: 84 (22.1%)
Are you satisfied with bike storage and parking on campus?

- Yes: 128 (33.3%)
- No: 128 (33.3%)
- N/A: 128 (33.3%)

How important is covered bike storage to you?

- Extremely Important: 56 (14.6%)
- Very Important: 82 (21.4%)
- Moderately Important: 110 (26.6%)
- Slightly Important: 57 (14.8%)
- Not at all Important: 79 (20.6%)

If you do own or rent a bike, how often do you bike on campus?

- Daily: 114 (29.7%)
- Weekly: 52 (13.5%)
- Monthly: 31 (8.1%)
- Never: 23 (6%)
- N/A: 164 (42.7%)

How easy do you find it to bike to destinations on campus?

- Easy: 42 (10.9%)
- Somewhat Easy: 114 (29.7%)
- Moderate: 57 (14.8%)
- Somewhat Difficult: 26 (6.8%)
- Difficult: 6 (1.6%)
- N/A: 139 (36.2%)

To what extent do you agree with the following statement?

- Agree: 100 (26%)
- Somewhat Agree: 92 (24%)
- Neither Agree nor Disagree: 30 (7.8%)
- Somewhat Disagree: 40 (10.4%)
- Disagree: 12 (3.1%)
- N/A: 110 (28.6%)

“I feel safe biking on campus paths.”
To what extent do you agree with the following statement?

<table>
<thead>
<tr>
<th>Agree</th>
<th>Somewhat Agree</th>
<th>Neither Agree nor Disagree</th>
<th>Somewhat Disagree</th>
<th>Disagree</th>
<th>N/A</th>
</tr>
</thead>
<tbody>
<tr>
<td>62</td>
<td>82</td>
<td>27</td>
<td>70</td>
<td>39</td>
<td>104</td>
</tr>
<tr>
<td>18.1%</td>
<td>21.4%</td>
<td>7%</td>
<td>18.2%</td>
<td>10.2%</td>
<td>27.1%</td>
</tr>
</tbody>
</table>

“I feel safe biking on Spring Street”

As a pedestrian, how do you feel about the use of sidewalks on campus by cyclists?

<table>
<thead>
<tr>
<th>Love it</th>
<th>Like it</th>
<th>Neutral</th>
<th>Dislike</th>
<th>Hate it</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>32</td>
<td>189</td>
<td>113</td>
<td>35</td>
</tr>
<tr>
<td>3.9%</td>
<td>8.3%</td>
<td>49.2%</td>
<td>28.4%</td>
<td>9.1%</td>
</tr>
</tbody>
</table>

How likely would you be to use a new bike path connecting Garfield House and Weston Field?

<table>
<thead>
<tr>
<th>Likely</th>
<th>Somewhat Likely</th>
<th>Neither Likely nor Unlikely</th>
<th>Somewhat Unlikely</th>
<th>Unlikely</th>
</tr>
</thead>
<tbody>
<tr>
<td>116</td>
<td>108</td>
<td>66</td>
<td>46</td>
<td>48</td>
</tr>
<tr>
<td>30.2%</td>
<td>28.1%</td>
<td>17.2%</td>
<td>12%</td>
<td>12.5%</td>
</tr>
</tbody>
</table>

How often do you drive a car from one destination on campus to another?

<table>
<thead>
<tr>
<th>Daily</th>
<th>Weekly</th>
<th>Monthly</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>75</td>
<td>55</td>
<td>235</td>
</tr>
<tr>
<td>4.9%</td>
<td>19.5%</td>
<td>14.3%</td>
<td>61.2%</td>
</tr>
</tbody>
</table>

How important is it to you to improve bike tourism in the Berkshire Region?

<table>
<thead>
<tr>
<th>Extremely Important</th>
<th>Very Important</th>
<th>Moderately Important</th>
<th>Slightly Important</th>
<th>Not at all Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>69</td>
<td>75</td>
<td>124</td>
<td>61</td>
<td>55</td>
</tr>
<tr>
<td>18%</td>
<td>19.5%</td>
<td>32.3%</td>
<td>15.9%</td>
<td>14.3%</td>
</tr>
</tbody>
</table>
B. INTERVIEWS

i. Interview with Andrew Groff, 10/27/2015

(Please note: italicized responses are not exact quotes)

1) We are aware that there are potential drainage/stormwater runoff issues having to do with the impermeability of the track. How do you recommend we approach these concerns? Is there a systematic way of doing so?

*Not really, because the project is tiny, but we could propose low impact techniques such as banking for the path, and storm/rain gardens*

2) Does Williamstown adhere to the the regulations established under the U.S. EPA's NPDES Municipal Separate Storm Sewer Systems permit (the MS4 Permit) for the discharge of stormwater? If so, will we need to take this into account in our planning of the bike path?

*No, Williamstown does not, because Williamstown is too rural. Instead, we should follow Mass DEP stormwater manual suggestions*

3) Even if we are not required to consider the MS4, do you suggest ways we might integrate aspects of its guidelines into our design? Signage, for instance? Or drains? Or rain gardens?

*See answer to Question 1.*

4) What about the WPA area at the foot of Spring Street (Christmas Brook and environs)? Will we need to file an RDA with the Conservation Commission?

*We only need to file an RDA if we enter the riparian zone. If we stay in the parking lot and do not extend Latham Street, we don’t need to file an RDA. But if we do cross into the Wetland Area (within 50 feet) below the parking lot, we should probably go ahead and file an NOI with the Conservation Commission.*

5) Our bike path will likely be set off from the road along its length. This will place it very close to Christmas Brook as it turns the corner onto Latham Street. Is this legal? Or do we need to work with the current footprint of the road?

*Need to work with current footprint. There isn’t room here; we’d have to build a bridge.*

6) Is the fact that our bike path will cross a riparian boundary on Latham Street an issue for the project?

*No, because Latham Street is an already existing structure. If all we do on Latham Street is paint extra lines onto the pavement, we don’t have to worry about the riparian boundary.*
7) This question is coming after reading the general proposal form for the Mohawk Bike Path Study, sent to us by MaryKate O’Brien. Do we need to consult with the MassDOT Environmental Services Division regarding National Environmental Policy Act (NEPA) and Massachusetts Environmental Policy Act (MEPA) requirements?

   - We should check to make sure that we are not in an endangered species zone. If not, we don’t need to communicate with MEPA. In order to find out if we are in an endangered species habitat zone, we can look through the Mass GIS files - Oliver viewer - priority and estimated.
   - We don’t need to talk to MassDOT if we are not seeking state funding. Andrew thinks that we probably wouldn’t get funding anyway because the path is mostly on campus.

8) Do we need to consider any other state or national environmental acts or statutes?

   No.

9) Do we need to consider hazardous materials?

   No.

10) Is Christmas Brook an impaired water body?

    Yes, it is an impaired water body, but there are no specific regulations for dealing with this besides a suggestion to look for ways to improve it. We could try to include suggestions/possibilities for improvement in our design.

11) Otherwise, what other things might we need to get permissions for, and who would we get those from, and how would we go about getting them?

    Suggestion: We could use Denison Park Drive, but we’d need more wetlands permission.

12) Given that the majority of the property seems to be on College property, should we be thinking about surveying the spring street or local community that is outside of college jurisdiction?

13) Given that the majority of the property is on College property, are we exempt from such of the town regulated planning process? (Such processes as, for instance, the Cole Field bike path team had to follow?)

    Generally, yes.

14) Under what circumstances should we bring the project to the entire planning board?

    This depends on the context in which the path is built. If it becomes part of another, larger, construction project (i.e. the dorm - for instance by working as an access) then we need to bring it to the Zoning Board.
If the path is separate from the larger projects it is too small for us to need to bring it before the planning/zoning boards. This is pretty subjective- basically, we shouldn’t allude to any connection with other construction projects.

15) What are your thoughts about a counter-flow one-way bike lane up spring street in between the sidewalk and parallel parked cars?
Try it- but we’re likely to get a lot of blowback.

16) What do you expect to be the most likely site for the Williams Inn? Plan B would have the potential to interfere significantly with our bike route.
(Did not know.)

ii. Interview with Rita Coppola-Wallace, 11/5/2015

(Please note: italicized responses are not exact quotes)

1. What future construction plans between Water Street and South Street are you aware of?
Walden (which is town property) will become 2-way with no parking; 22-23 feet wide, with a sidewalk.
2. Do our routes look feasible?
Depends on a lot of things.
3. How should we handle a bike path on Latham Street?
Latham may be extended to curve around the parking lot and connect to Walden; talk to Jason Hoch.
4. Are the houses on either side of Walden (near the parking lot and near the site of the new bookstore) going to be moved in the near future?
The houses north of Walden will be moving. The Bike club will move to Pratt. The garage on the south side is not moving.
5. What do you know of the proposed new hotel at the bottom of Spring Street?
While working on the area at the bottom of Spring Street, they will likely clean up Christmas Brook. The culvert may be widened. As of yet, a clear choice between the two Inn plans is not evident.
6. What will happen to the mini parking lot at the end of Walden? Will it stay?
The college owns the parking lot, which will most likely be widened on the North, South, and West sides.
7. How likely is the new road to be built?
100% going to be built.
8. What exactly is the planned route of the new road? Specifically, does it go behind or in front of the health center? If in front, would it go on the cut facilities made to move the new facilities house?
It will go in front of the health center.

9. Are there any plans for South Street, in case we decide to extend our path/lanes to rt 2?
   
   No.

10. Will the end of Stetson Court (the mini driveway between the end of Stetson and the Health Center parking lot) be opened to cars?
   
   Probably.

11. What are your thoughts on a counter flow bike lane up Spring Street?
   
   This would be a town issue; there will be concerns.

12. Is there anyone else we should talk to regarding developments in this area of campus?
   
   Will Dudley or Fred Puddister

13. From your perspective, what steps could we take in our planning process to increase the likelihood of a bike path or lanes actually being implemented?

   Do it around 2020, after the science building.

   iii. Interview with Jason Hoch, 11/12/2015

   On November 12, we spoke with town manager Jason Hoch about our plans to design the bike path between South Street and Water Street. We wanted both to ensure that Jason was in the loop regarding the parts of our bike path that would cross town property, and to get some feedback from him regarding the steps we might need to take regarding town permissions for path construction. Our first major takeaway from the conversation with Jason was the additional confirmation that the new road was definitely happening. The project for the existing section of Walden, however, is as yet undetermined.

   Jason had some helpful suggestions for bike paths as well. In fact, it was Jason who first introduced us to the idea of advisory lanes. He suggested that advisory lanes might be a possibility for Walden Street. Interestingly, Jason wasn’t enthusiastic about the idea of painting bike symbols onto Latham for shared bicycle/motor vehicle accommodation lanes. “Sure we

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93 Interview with Jason Hoch, 11/12/15, Williamstown.
could do it,” he said, “but it doesn’t change driver’s behavior.” Still, he was willing to experiment with the idea as a trial because the project would be so inexpensive.

Jason also suggested new routes for our bike path, including one route which we considered that would use Denison Park Drive and then swing around the back side of Doughty House. However, we had previously rejected this idea because it doesn’t rate high in usability. That is, cyclists might be unwilling to take a path to the north side of campus that takes them on a roundabout route. Another route that Jason suggested would go from Spring Street through the indoor track/rink complex, and connect with Water Street closer to Route 2. We are disinclined to suggest this, however, because it avoids Latham Street altogether, and part of our project involves helping to revitalize Latham Street. It would also be more complicated and expensive than other routes.

Jason was unconvinced of the viability of a counter-flow bike lane on Spring Street, but said that he would have no problem with people suggesting it as a demonstration and a test. He noted that we would just be painting lines, not constructing anything, and pointed out that Spring Street will be repaved anyway in the next couple of years. He wanted us to make clear, however, what it is that we would be testing if we wanted to make it permanent?

Lastly, Jason also suggested that we present our proposed bike route at a town meeting.

*iv. Interview with Craig Wilbur, 11/17/2015*

On November 17, we spoke with Craig Wilbur, who is the project manager in charge of the Walden Street extension project (i.e. what we have referred to herein as “the new road.”)\(^9\) In effect, this meeting served to make official for us the future of the new road. In fact, Craig told

\(^9\) Interview with Craig Wilbur, 11/17/15, Williamstown.
us that Williams has recently hired a bike accessibility consultant in coordination with the state. The coordinator will be involved in planning out all planned bike paths throughout campus. We feel that our proposal will be better served if we develop our ideas without conferring directly with the bike coordinator, however, because this will insure diversity of concepts for the college to work with.

The planned Walden extension to South Street is definitely happening, but when and how it is built has a lot to do with private property concerns, according to Craig. Specifically, there is one house at the end of Hoxsey Street that is privately owned, and the college must acquire it and move it before the road is built along the planned route, because the planned route is too near the house to allow comfortable living. Work for the road will begin in late spring of 2016 and end in August, no matter what happens with the house, but if Williams is unable to acquire the house the road may need to curve around the house as it connects to Hoxsey Street, rather than running in a straight line from Hoxsey Street to South Street. The general concept as of now for the Walden Street extension is a 20-foot two lane road, with a 5 to 10 foot bike path (depending upon whether the bike path is one or two way), and a six foot sidewalk on one side. This entire project, consisting of 1,000 linear feet, will cost $1.6 million, including costs for DOT specs, the sidewalk, bike path, lighting, sewer, and stormwater considerations.

Craig also mentioned the plan of moving the Spring Street end of Walden Street so that it loops downward and connects directly with Latham, but he told us that this is all very hypothetical and far in the future so it would be unwise to plan a bike path there. Similarly, Spring Street may become 2-way in the future, but this too is hypothetical.
We asked Craig about the possibility of moving the telephone poles on Walden Street, or to remove the kick-brace from the poles, in order to build an off-road bike path. His response was not encouraging. First of all, the kick braces are only there because the remaining poles required additional support after another two were removed to allow the Miller house move. In theory, once the other poles are replaced, the kick brace should be able to come off, but Verizon, who owns the poles, would not remove the brace unless requested to do so. Furthermore, this removal would cost approximately $10,000. If facilities says that the pole needs the brace, however, the only option is to move the pole itself. Verizon would move the pole, but charge $20,000 per pole. Furthermore, if the pole is moved Williams College would need to pay National Grid and Time Warner as well, bringing the cost above $20,000. This is because while Verizon would move the pole, National Grid would move their power lines, Time Warner would move their power lines, and each would charge separately for each action. Finally, it would take 7 months to have the poles moved.

Another issue with building a bike path off Walden Street is the underground water retention structure which is located eight feet north of Walden Street. If we put a paved path over this we would need to talk to Jason Moran, and we would also have to take into account surface pitch, and how that would impact sediment control.

Lastly, Craig told us that Walden will go back to two-way in the next four months, and once it’s two way, the chances of getting a bike lane onto the road would be slim to none. Our options would then be the Latham Street approach (with on-road, paint only suggested lanes) or an off-road path. To that end, he pointed out that an 8 foot bike path along Walden would likely be infeasible because we can’t do a 10 foot path due to the water retention structure. He
mentioned, however, that we could talk to Jason Miner, project manager for the new science center, to figure out if we could put a bike path on the other side, where there is already a sidewalk. We feel that this is unlikely, however, because we need to provide for pedestrians and we don’t want to remove pedestrian access.

Craig told us that he is pleased to have our input because he wants the extra research and advice to facilities regarding the various options for a bike path on this new road. To this end, Craig asked that we share with him any ideas we come up with for specs, ideas, and designs. Our input, he told us, “is not just conceptual for a class.” Some concepts that Craig himself suggested included a possible small barrier between the road and the bike path, such as a low swale that would allow easy plowing.
VII. WORKS CITED

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