

# Proposed Bike Trail Paths Connecting The Vinings to Furman University

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## Abstract

This project utilized ArcGIS software to develop 3 possible bike paths connecting The Vinings at Duncan Chapel to the main Furman University campus. **Due to an increased number of Furman student residents in The Vinings and the safety hazards associated with biking on Duncan Chapel Road, a bike path as an alternative transportation route would be beneficial.** Use of a bike trail and safety of trails were determined using surveys of student residents of The Vinings. Paving estimates are based on information from the National Asphalt Paving Association. Having analyzed amount of paving and safety, Trail Option B is determined to be the most cost-effective choice for Furman University as a whole. This bike trail will benefit Furman student residents of The Vinings by providing an alternative transportation option as well as Furman University as a whole by reducing its carbon footprint.

## Introduction

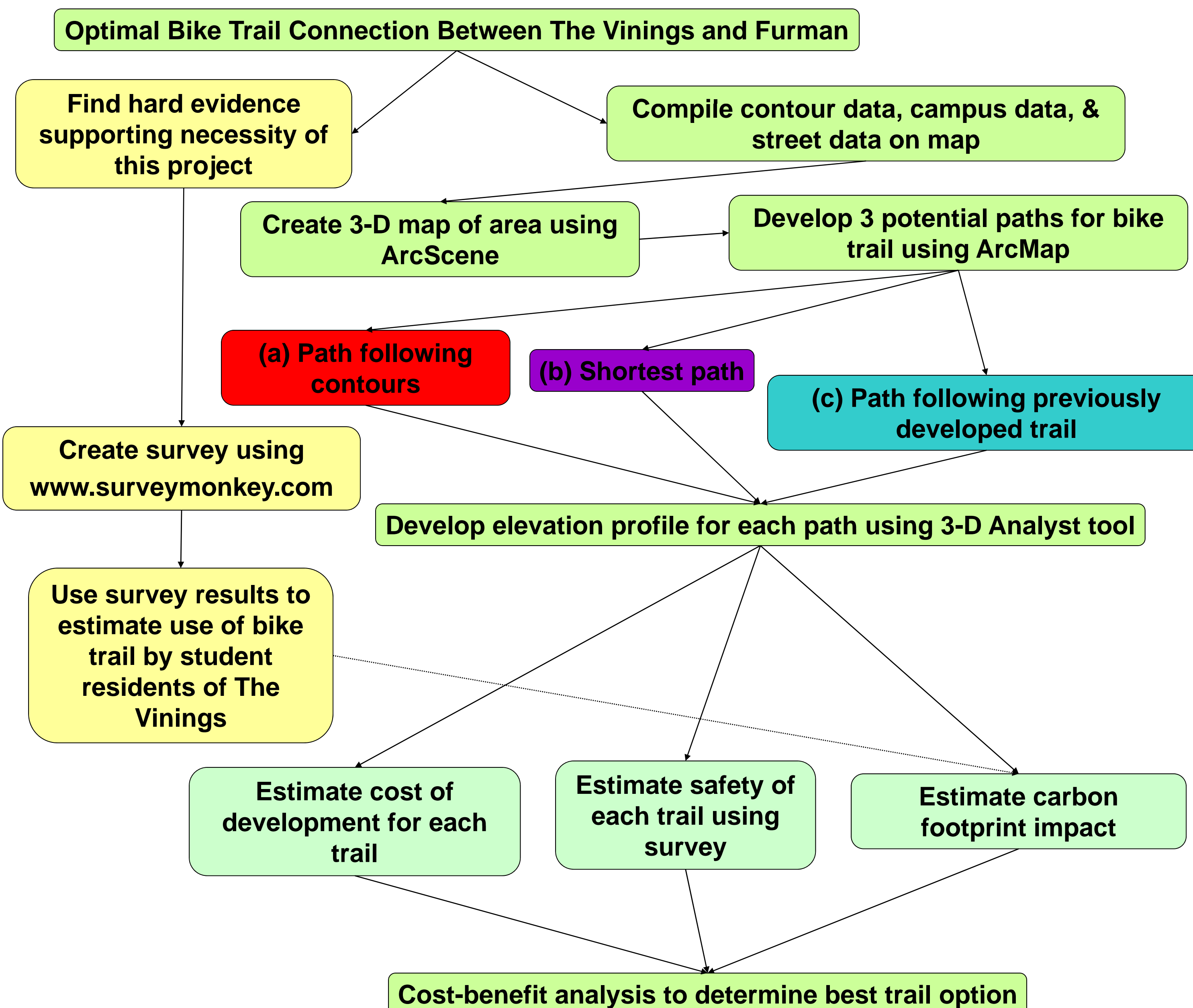
The results of a survey of student residents of The Vinings indicate that if a safe trail were available, then 71% of these students would utilize that trail instead of driving their car to campus. The typical 1.039 mile trip to and from campus from The Vinings incurs a carbon footprint of .01 tonnes of CO<sub>2</sub> per car per week. **If the 71% of supportive students utilized the constructed trail, Furman's carbon footprint would be reduced by 19.45 tonnes of CO<sub>2</sub> per academic year, not to mention the health benefits.**

This proposal includes three possible paths connecting The Vinings and main campus.

## Objective

The purpose of this project is to determine a realistic, cost-effective bike trail connecting The Vinings at Duncan Chapel to the main Furman University campus.

## Methods



## Trail Specifications

All trail options begin at the front entrance to The Vinings at Duncan Chapel and end at a paved surface on Furman's campus. Cost estimates were made based on a 4 foot wide, 4 inch thick trail and the use of hot mix asphalt. Hot mix asphalt was chosen because of its low lifecycle costs. Perceived safety was determined by student survey which asked students to rank trails on a scale of 0-5, with 0 being completely unsafe and 5 being extremely safe.

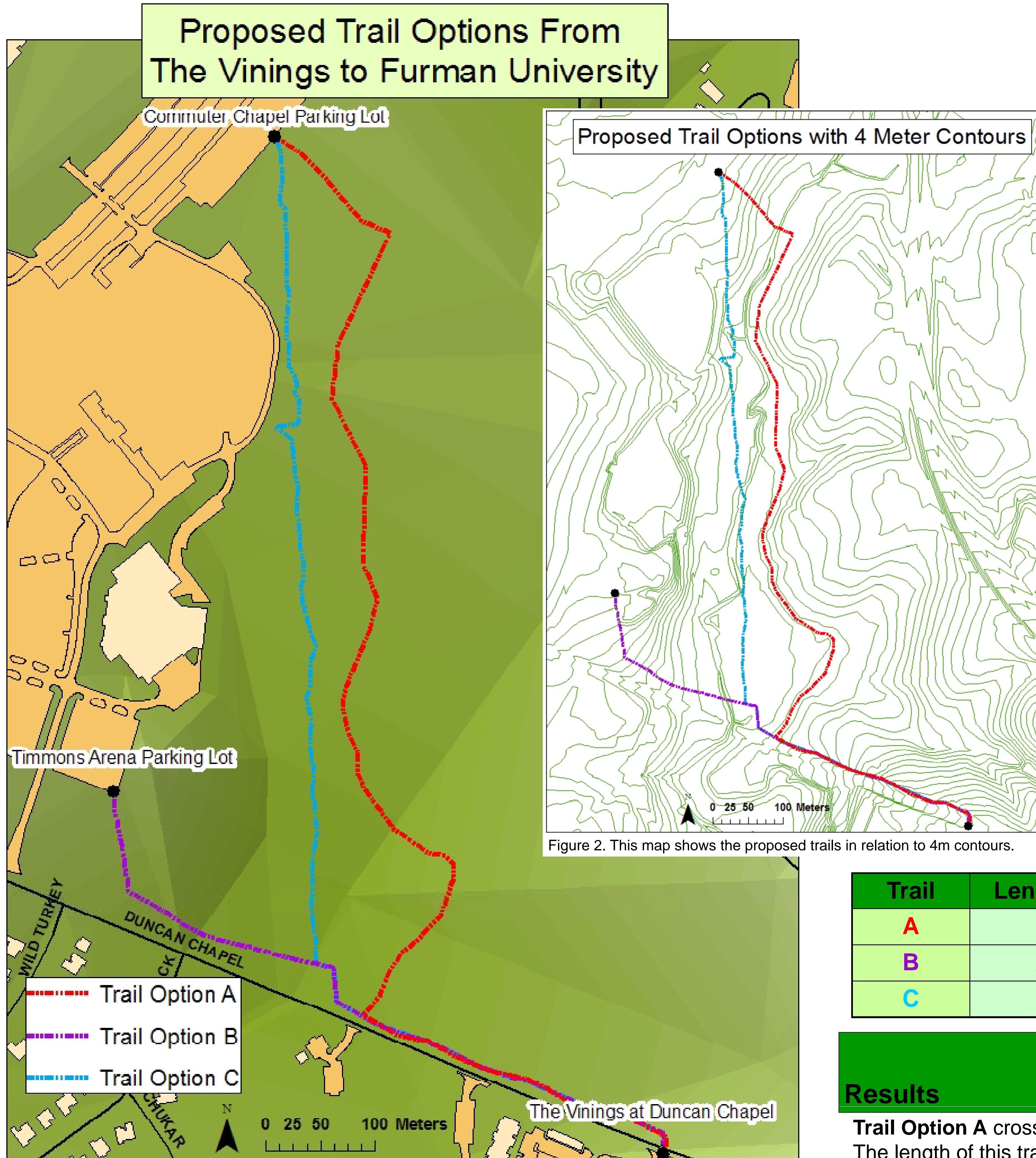


Figure 1. This map shows the proposed trails from The Vinings to Furman University in relation to campus buildings and parking lots.

## Surveys

**The Use Survey** was posted to Student News and available for one week. Eighty (80) student residents of The Vinings responded. The Use Survey questions included:

- Of which of the following are you a current resident? (The Vinings, North Village)
- One most days, how do you get to class? (Drive, walk, bike)
- If a bike was available to you, would you use it to get to class? (Yes, No)
- Why or why not? (Open-ended)
- If a safe bike trail was available to you, would you prefer biking over walking or driving? (Yes, No)
- Describe your current reasons for your choice of transportation to class. (Open-ended)

**The Safety Survey** was posted to Student News and available for 3 days. Forty-four (44) student residents of The Vinings responded. The Safety Survey questions included:

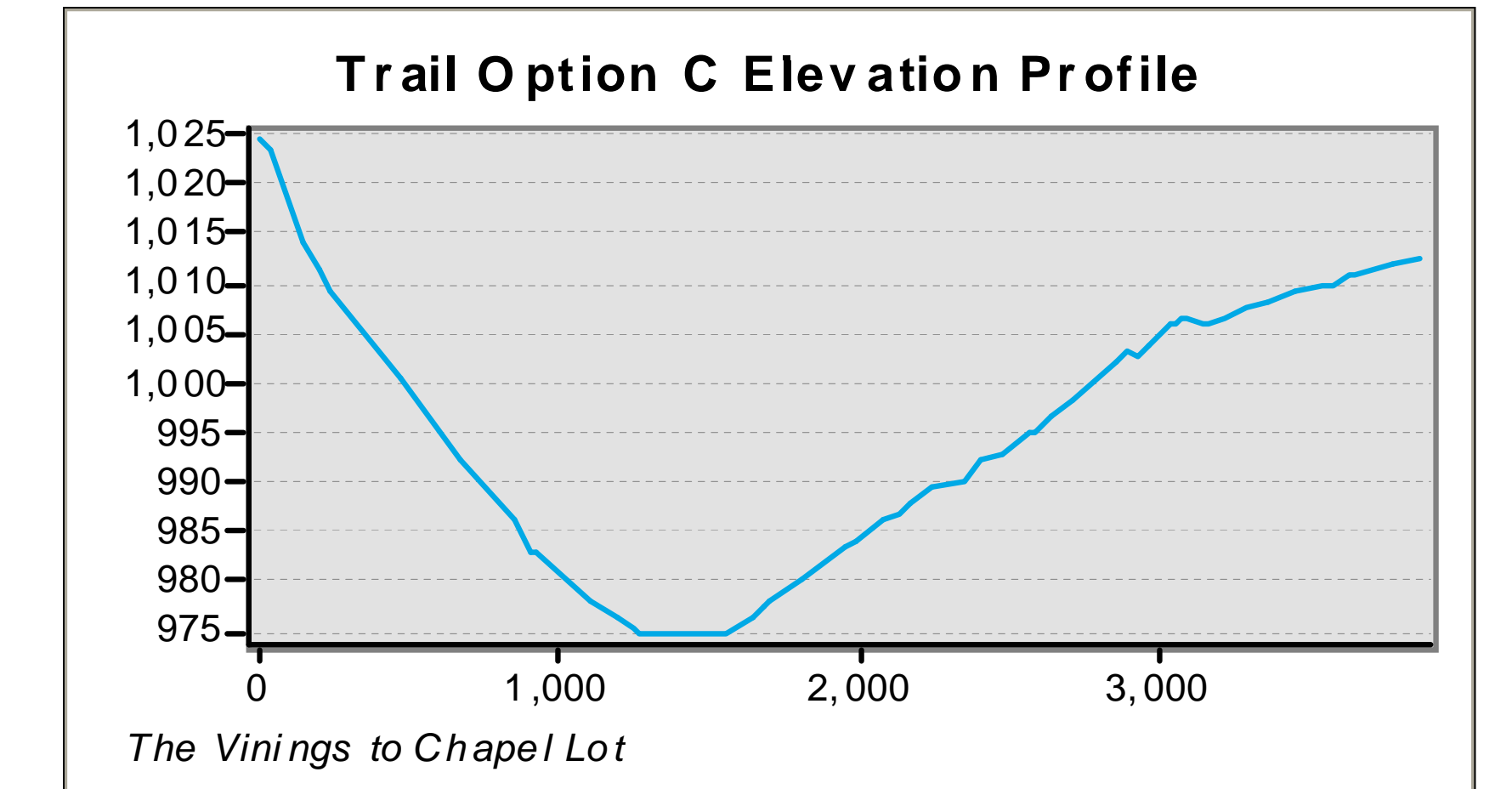
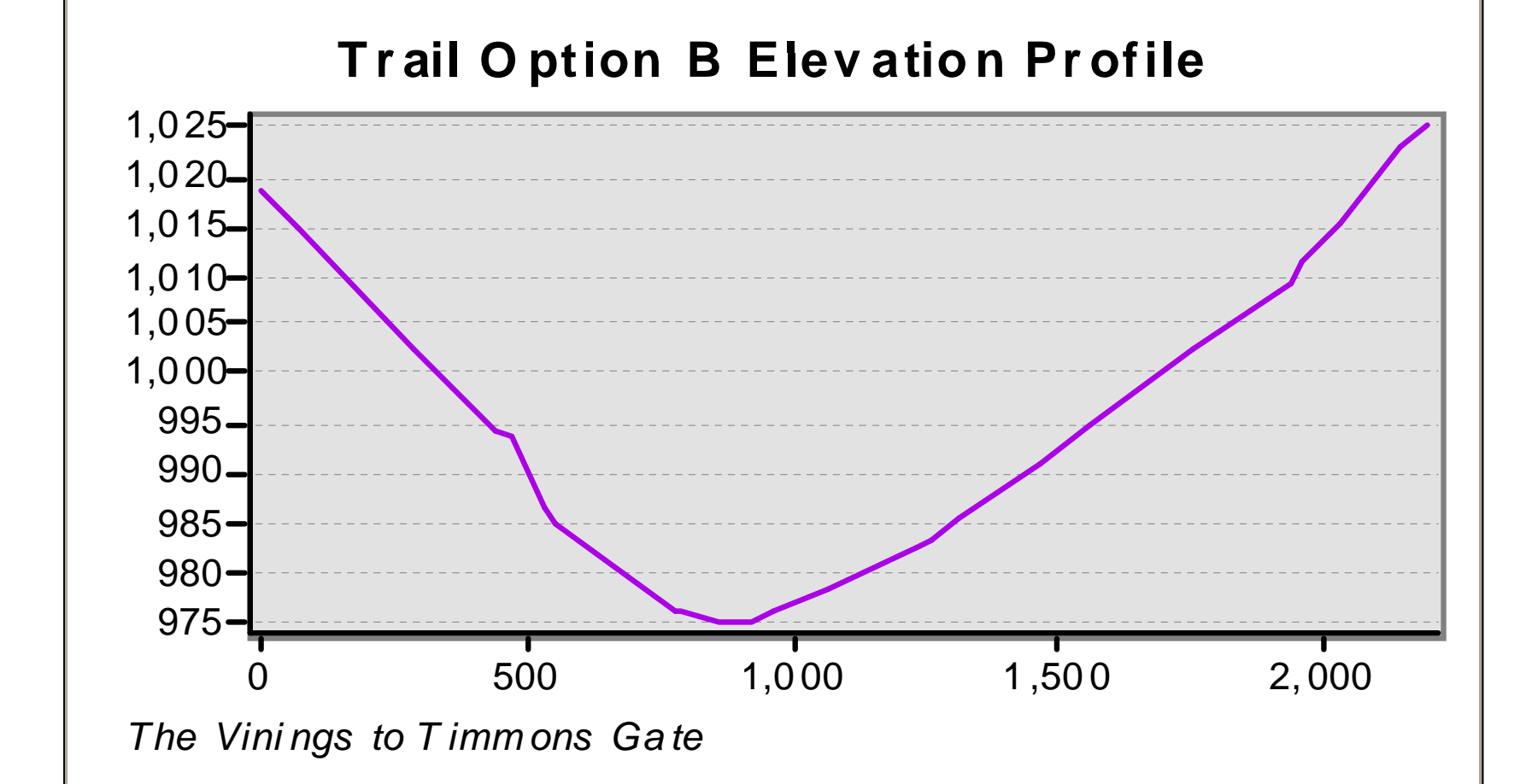
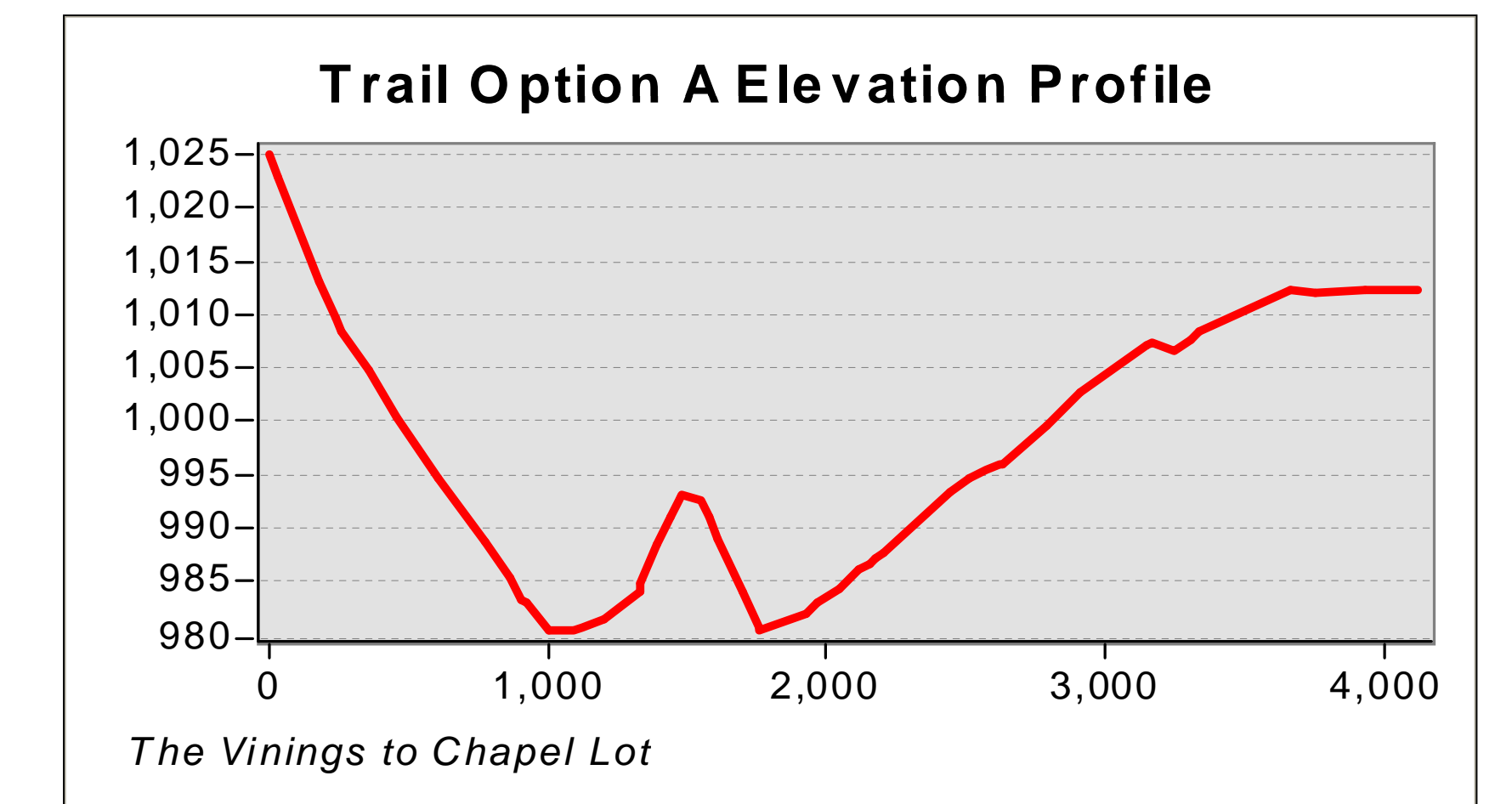
- Are you currently a student resident of The Vinings at Duncan Chapel? (Yes, No)

If Furman were to construct a path connecting The Vinings to main campus, these are 3 possible trail options. Considering elevation changes, lighting, time of day traveling to class, proximity to Duncan Chapel Road, and any other factors you believe to play a part in safety, rank the safety of each of the trails pictured on a scale of 0-5, with 0 being completely unsafe, 3 being safe enough to bike during the day but not at night, and 5 being extremely safe.

- Trail A? (Open-ended); Trail B (Open-ended); Trail C (Open-ended)

Acknowledgements: Special thanks to Dr. Suresh Muthurkrishnan and all student residents of the Vinings that completed the survey referenced in this project.  
Sources: Furman University contours, buildings, parking, roads (N:\Data\Furman); SurveyMonkey (<http://www.surveymonkey.com>); Carbon Footprint (<http://www.carbonfootprint.com>); National Asphalt Paving Association (<http://www.hotmix.org>)

Projection: NAD 1983 Lambert Conformal Conic



Figures 3-5. These graphs show the elevation changes along each trail from The Vinings to Furman University.

Trail	Length (feet)	Cost of Asphalt (\$)	Perceived Safety
A	5,373	233,557	3.2
B	2,169	90,206	4.5
C	3,874	163,005	2.7

## Results

**Trail Option A** crosses Duncan Chapel Road and follows land contours to Chapel Lot. The length of this trail is 5373.47 feet. The estimated cost of asphalt for this path is \$223,557.00. The student-perceived safety of this trail is 3.2.

**Trail Option B** crosses Duncan Chapel Road, runs parallel to the road, picks up a small section of the Timmons Trail, runs to the Timmons parking lot. This trail would only require paving of 2,169.2 feet. The estimated cost of asphalt for this path is \$90,206.00. The student-perceived safety of this trail is 4.5.

**Trail Option C** crosses Duncan Chapel Road, runs parallel to the road, picks up a large section of the Timmons Trail, and then follows land contours to CL. The estimated cost of asphalt for this path is \$163,005.00. The student-perceived safety of this trail is 2.7.

## Conclusion and Discussion

**Trail Option B will be the most cost-effective trail for Furman University to construct connecting the main campus and The Vinings due to its limited paving.**

Constructing Trail Option B would provide a safe, eco-friendly way for student residents of The Vinings to travel to Furman's campus with less expense to Furman than the other options given by this project. Survey results indicate that 71% of student residents of The Vinings would utilize a bike trail of this sort, decreasing Furman's carbon footprint by 19.45 tonnes of CO<sub>2</sub> per academic year. Safety survey results provide feedback concerning students comfort with the trails and indicate that Trail B is the safest option.

An issue not addressed by this project is the construction of a traffic light and cross-walk at the entrance to The Vinings. In order to ensure the safety of students utilizing the path, this traffic light would provide safe crossing of the busy Duncan Chapel Road.

An investigation into the use of permeable pavement instead of hot asphalt to minimize the environmental impact from the proposed bike trail may also be beneficial when looking at rainfall run-off.