

GIS Campus Transportation Survey: Least-Cost-Path Analysis of Bicycle routes on the Hill

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Abstract:

This project analyzes the possible walking routes around campus and whether they match the already existing paths. It also proposes a few path implementations in order to ease people as they travel around campus and help people decide which paths are faster than others when travelling to different locations. The project makes a clear distinction between possible paths in the winter and summer; winter path options don't include travelling on grass due to the snow on the ground which leaves many parts of campus inaccessible by foot.

Methods:

The first part of the project consisted in creating an updated campus map. It was important to insert all the new buildings, such as the art museum, so as to provide PPD with an updated campus map. This was done as a group effort because it required labelling the entrances, creating through paths through buildings and updating the paths. We took Vector and Cad data that was provided by PPD to create a raster data map, Figure 1, to use for our analysis.

The second part of the project consisted in reclassifying the raster in order to be able to perform two Least Cost Analysis. One for the Winter Path and one for the Summer Paths. For the Winter, grass and natural features were weighted more than paths and roads so as to make them inaccessible, just like one would expect in the Winter.

Conclusions:

From the Least Cost Paths around campus that connect Roberts, Diamond and Williams we can see that most existing paths coincide perfectly with the least cost path. In some cases, though, the Least Cost Analysis seems to present different paths that could be followed in order to get from one building to another. From the analysis one can see that there are three main locations in which new paths could be implemented in order to ease the travel of pedestrians around campus.

- The Eustis parking lot should contain an extra short path that connects it to Miller Lawn more directly. This would help the ease of visitors on campus when trying to go to Miller Library or Olin from the parking lot, without having to go around Eustis. (Shown by New Path 1)
- Miller Lawn should include 2 paths that connect Olin with the Eustis parking lot so as to ease the general travel of pedestrians on the lower part of campus. (Shown by New Path 2)
- Just 20 meters below the chapel where the ground starts to level a path should be placed, parallel to the already existing path, to ease the travel from Diamond to Hillside. (Shown by New Path 3)

Figure 1: Updated Colby Campus Map. (Reclassified for Summer)

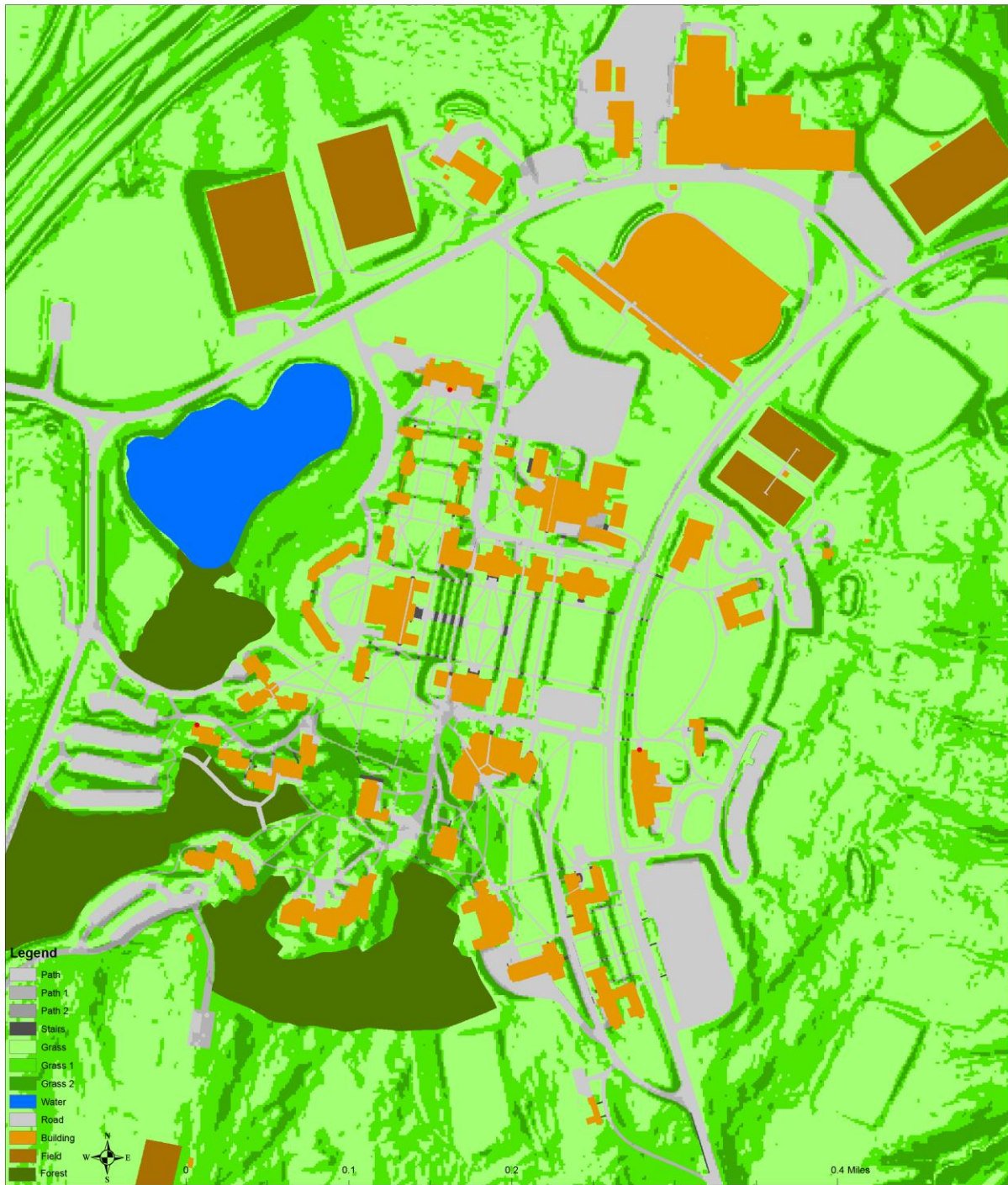


Figure 2: Updated Colby Campus Map. (Reclassified for Winter)



Figure 3:

Figure 3 – This is a map which shows all the possible paths from Roberts to Diamond to Williams during the Summer and during the Winter using different classification schemes. Clearly shown are the differences in length between the Summer and Winter paths. For the Summer paths the reclassification, Figure 1, allows for grass areas of all steepness to be accessed by foot, whereas for the winter reclassification, as shown in Figure 2, shows how all grass areas are inaccessible due to the snow which

constricts the Least Cost Paths to travel exclusively on walking paths or roads. New path have been drawn to show how they would aid students and visitors to travel around the Colby College Campus in both the Winter and the Summer seasons.

