Driving VS. Walking
Middlebury Students on Their Way to the Athletic Center
by Esme Lutz

What are you looking at? These 9 maps show the time difference between walking and driving from various buildings on campus to the athletic center. If the building is blue, you’ll save time if you choose to walk; red buildings indicate that drivers will reach the destination faster.

This project examines parking availability at Middlebury College in relation to intra-campus driving. It originates from the notion that students often drive to locations on campus that are within walking distance—a practice that makes a negative and avoidable environmental impact.

Focusing on driving to the athletic center as a case study, this project estimates travel time, both walking and driving, to the athletic center from various locations on campus; compares the impact that alternative parking schemes might have on student behavior.

With the intended renovation of the Bubble, the college has the prospective opportunity to effect an institutionally desired social change (less intra-campus driving) through infrastructure design. This project—by modeling both current and alternative parking schemes—has the potential to offer information that would facilitate the ability of those in charge to make a more educated decision about how (or if) parking should be restructured.

COST = TIME

COLOR SHOWS DIFFERENCE IN WALKING AND DRIVING TIME TO THE ATHLETIC CENTER FROM EACH BUILDING

What do these graphs mean? This project looks to isolate those instances when driving time is greater than walking time and to discover whether an alternative parking scheme might raise the incidence of this occurrence.

Red bars show that you lose time if you choose to walk and blue bars indicate that you will save time in comparison with driving. These graphs model origin/destination matrices to examine the difference between the time it takes to walk from the entrance of a building to the athletic center and the time it takes to walk from the entrance of a building to a parking lot, drive from there to another parking lot, then walk to the athletic center.

You will notice that it currently seems most cost effective to drive from a variety of buildings on campus to the athletic center. This analysis demonstrates, however, that moving the destination lot location to alternative areas further away from the athletic center entrance has the ability to increase driving travel time so that it exceeds walking time. These results suggest that relocating student parking from the athletic center to an alternative location may induce students to walk instead of drive.

How were these results calculated? The section below underlines key analysis parameters and particulars behind the steps that went into building networks, running origin/destination cost matrices, and collating the results.

Focus Origins: D Lot (Athlete 4/8); R Lot (Old gym); E Lot (Wright Theater/Johnson)
Focus Destinations: Athletic Center parking lot (current), Center for the Arts Parking Lot (alternative 1), Kirk Alumni Center Parking Lot (alternative 2)
Entry/Exit: centroids of parking lots: main entrance ways of key buildings and dorms
Walking network: includes intra-campus pathways and roads; pedestrian speed set at 3.2 mph
Driving network: only includes roads; driving speed set at road speed limit; network calculates constants of 3 seconds for crosswalks; 7 seconds for stop signs; 15 seconds for stop lights

Calculating Walking Time: Using an OD cost matrix on the walking network where (1) building entrances serve as origins and the entrance of the athletic center acts as the destination.

Calculating Driving Time: Using an OD cost matrix on the walking network where (2a) building entrances serve as origins and focus origin centroids act as destinations and (2b) focus destination centroids serve as origins and the entrance of the athletic center acts as the destination.

Using an OD cost matrix on the driving network where (2c) focus origin centroids serve as origins and focus destination centroids serve as destinations. Allocate 30 seconds for getting in the car and 20 for getting out for each trip.

Walking + Driving + Walking + Constants = Total Time

Sources: Middlebury College Geography Department