

# UMN-TC Climate Action Planning - Carbon Neutral Transportation System

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## Introduction

In 2008, the University of Minnesota – Twin Cities signed the Carbon Commitment, agreeing to achieve carbon neutrality by 2050. Since 2010, the University has confirmed its commitment to carbon neutrality by publishing the Climate Action Plan, outlining distribution of emission sources, and suggesting strategies and further research to reduce these emissions. [1]

Emissions are broken down into three scopes: [1]

Scope 1 – Sources directly owned or operated by the University

Scope 2 – Indirect sources resulting from University activities that occur within campus

Scope 3 – Remaining indirect sources

For this project, emissions originating from the transportation system at the University of Minnesota – TC were evaluated. This expands over transportation provided directly by the University (campus connector and circulator, fleet services), to public transportation, commute by students, staff, and faculty, and air travel.

The current carbon goal for the University requires a 50% reduction in total emissions from the 2008 baseline emission value by 2020. [1] As the deadline approaches, new strategies for reduction in emissions, including the transportation system from the University, are required.

## Objective

The objective for the project was to provide the following:

1. Complete assessment of current transportation system at UMN-TC and its corresponding emissions
2. Strategies for reduction in Greenhouse Gas (GHG) emissions in transportation
3. Recommendations on carbon neutrality date for transportation system at UMN-TC

## Boundary of Study

The project is focused on GHG emission data corresponding to the UMN-TC transportation system. This system is defined by the campus boundaries as illustrated in Figure 1.



Figure 1 | Cross Area OD 2016 by Yilun Xu.

Illustration of number of daily trips across the main areas of campus: East Bank, West Bank, Saint Paul, Como, and Dinkytown. [2]

## Current Transportation Emissions

Reports from Second Nature quantify emissions from transportation to be 22.7% of total carbon emissions at the University (as of 2016). This equates to 1115.6 MTCO<sub>2</sub>e out of the total 492,121 MTCO<sub>2</sub>e. Direct transportation accounts for 0.9%, student and faculty/staff commuting for 12.4%, and financed air travel for 9.4%. Figure 2 depicts the distribution of emission sources at the University of Minnesota for the three scopes based on amount of MTCO<sub>2</sub>e emitted. [3]

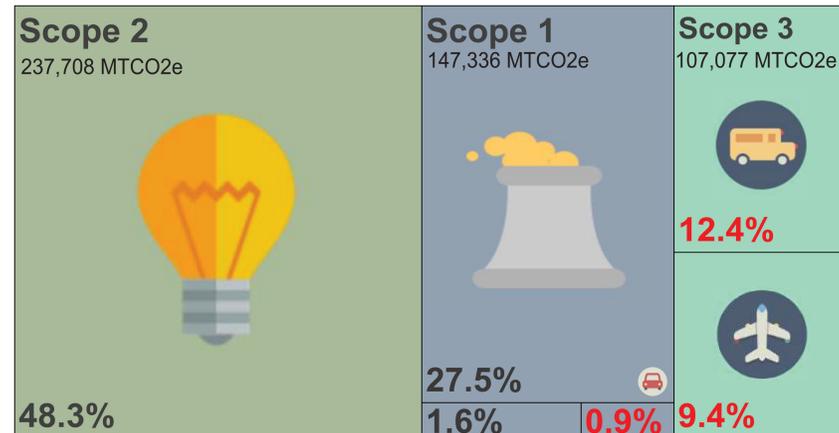


Figure 2 | Distribution of Emission Sources within Each Scope.

Percentages marked in red correspond to emissions related to the transportation system at UMN-TC. [3]

## Current Mode Share on Campus

Mode share data outlining the method of transportation utilized by students, faculty, and staff at UMN-TC was analyzed to assess the current transportation system and make recommendations accordingly. Figure 3 depicts the distribution of transportation modes on campus. As illustrated, public transportation is the most used commute strategy by students. Both staff and faculty drive alone as their primary commute method. [4] The graph below depicts popularity of commute methods by students, staff, and faculty.

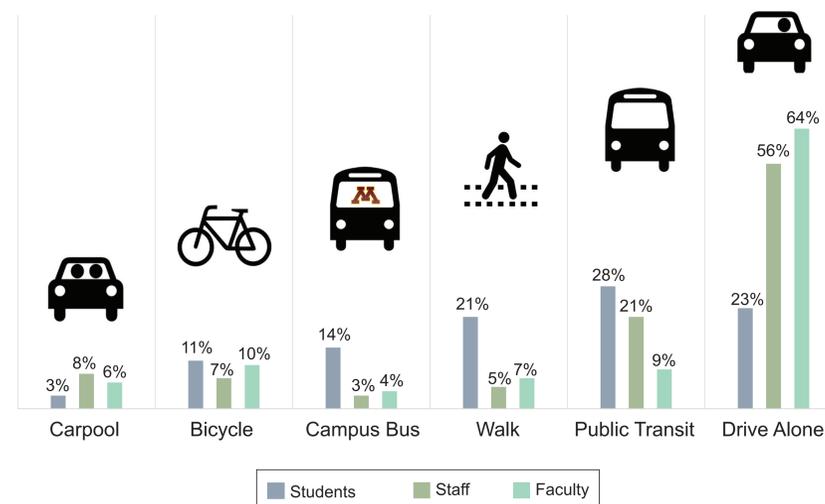
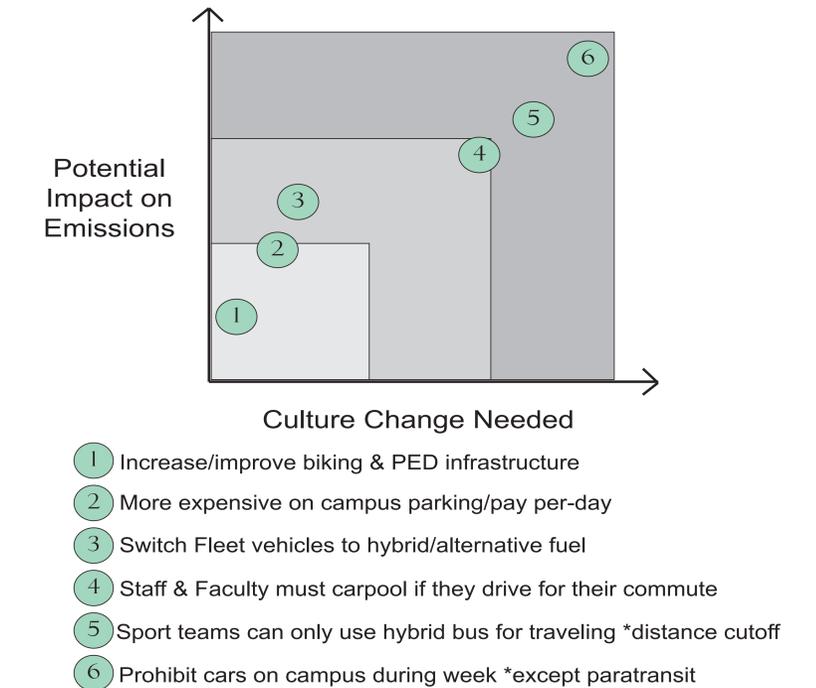


Figure 3 | Distribution of Travel Modes by Students, Staff, and Faculty.

Data collected via e-survey by the Office of Measurement Services in 2014, with a total of 2,384 participants. [4]

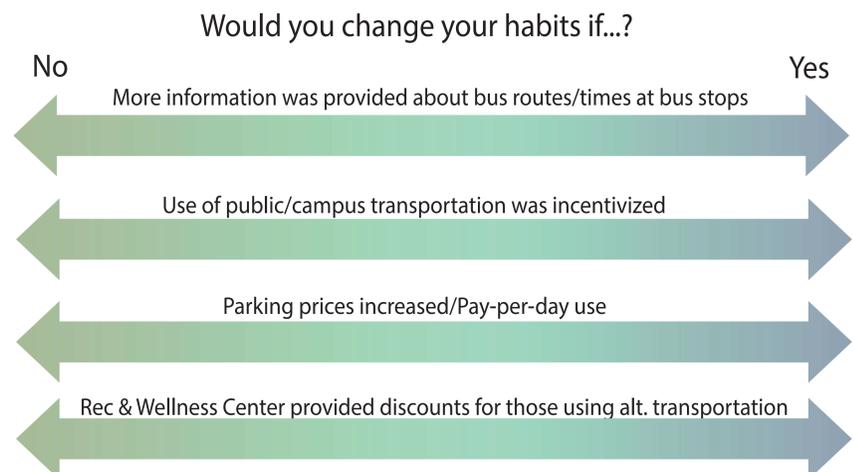
## Recommendations

Recommendations to be made will need to align with the current market for transportation technology, as well as maintain convenience, cost-effectiveness, and habits of current users. Some of these include using strategies like opt-outs, incentives, greater education and advertisement, and increasing usability. The following diagram illustrates specific recommendations.



## Conclusions

Based on research and interviews conducted thus far, it can be concluded that focusing on each transportation type individually will be most effective. First, creating strategies for emission reductions in Fleet, then commuters, and lastly air travel. These should be looked at with all three Twin Cities campuses as a whole.



References:  
 1. "Climate Action Plan for the University of Minnesota, Twin Cities." *University of Minnesota Twin Cities Sustainability Committee*. December, 2011, <http://www.sustainable.umn.edu/>. Accessed 10 April 2017.  
 2. Xu, Yilun. "Cross Area OD 2016." *Parking and Transportation Services*. 31 Jan. 2017.  
 3. "Annual Progress Evaluation 2016 - University of Minnesota - Twin Cities." *Second Nature Reporting Platform*. 2016, <http://reporting.secondnature.org/>. Accessed 10 April 2017.  
 4. "Fundamental Facts & Figures - Annual Report" *Parking and Transportation Services*. July 1, 2015 - June 30, 2016, <https://www.pts.umn.edu/>. Accessed 10 April 2017.