MPower Transportation Report
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Background and Purpose of Report

Project Description:
Sustain Dane will compile a guide for staff use on options for commuting. The guide will compare costs, time, and carbon impact for various distances/destinations of (1) Madison Metro, (2) Community Car, (3) B-Cycle, (4) Union Cab, (5) Personal Bike, (6) Single Occupancy Vehicle, and (7) Walking.

In our current building, we have one parking space for the entire staff to share. While staff has always preferred biking or walking, this parking situation has led us to realize how much we had been relying on the option to drive at the office on Paterson Street. Now that we are forced to limit our driving, we need to know what the best alternative option is.

Business Case:
Keeping staff happy with one shared parking space saves Sustain Dane $135/month over adding an additional parking space. Unless staff spends more than $135/month using Sustain Dane-sponsored means of transportation (Community Car, Madison Metro), we will be saving money.

Focus Area(s):
Energy
Climate Change
Waste Management
Water
Transportation
Supply Chain
Community and Educational Outreach
Workforce
Human Resources
Governance

What will success look like?

Sustain Dane does not purchase an additional parking space and staff is comfortable using alternative modes of transportation to everyday off-site activities (meetings, events, basic commuting).

Expected Impacts *(if applicable)*

Environment. Explain: Using alternative transportation almost always reduces CO2 emissions over SOV driving.

Financial Savings. Explain: Sustain Dane will save money by promoting alternative transportation over paying for another parking space.

Work Culture. Explain: We promote alternative transportation and should use it, too!
Community. Explain: We will share our knowledge and tools with the greater community to empower Madison residents to make informed transportation decisions.
Other: Explain:

Please describe how you will measure and document these impacts:
We can track staff transportation before and after "publishing" the transportation guide. We could also reach out to community members and businesses to see if our guide has changed their transportation methods.

Timeline of Implementation *(with dates)*

Action Step	People Responsible	Date
Collect information (costs, etc) for each mode	Amy & Lauren	1/15/14
Write Guide	Amy & Lauren	1/31/14
Track pre-publish transportation*	Amy	1/31/14
Track post-publish transportation*	Amy	2/28/14

*After research and careful deliberation, Sustain Dane decided that transportation tracking would not be an advantageous allocation of staff resources, particularly with a group of individuals who actively support and use alternative transportation. We do recommend this approach in organizations that identify their current practices as unsustainable.

Methods
The first step of this mini-transportation study of the Sustain Dane staff is to estimate projected external commuting costs based on:
- Time
- Cost
- Carbon Dioxide Emissions
- Distance

Below is an outline of the five steps of this transportation study:
- Step 1: Estimate transportation usage
  - Assumes one-way travel
  - Ignores time spent at destination
  - Assumes B-cycle dropped off at destination
- Step 2: Establish base rates of staff commuting usage
- Step 3: Use baseline data to Inform future decisions
- Step 4: Measure
- Step 5: Re-evaluate and share final results with community

Results

The project data provides both an estimate for Sustain Dane baseline commuter transportation data and a hypothesis for best transportation methods. These results are based on external variables, such as cost, time, distance, and carbon emission data (when available) and sorted by location. Data sets sorted by transportation type are available by request. A study by the Urban and Regional Planning Program at the University of Michigan recognizes the shortfall of using such external costs to transportation by calling to question the assumption that one, a reduction in driving coincides with environmental gains and two, that individuals must sacrifice transportation accessibility for sustainability. Levine's results indicate the potential for sustainability and inclusive mobility to co-exist by increasing population density (Levine 2009).

		Time	Cost	Co2 Emission	Distance
Monroe st to Sustain Dane					
	Walk	60 minutes	0		3 miles
	Personal Bike	18 minutes	0		
	S.O.V.	9 minutes	$1.76	3 pounds	
	Bus	22 minutes	$1.25		
	B-Cycle	18 minutes	$5		
	Community Car	9 minutes	$8		
	Union Cab	9 minutes	$11.55		

Table 1: Sample data chart for transportation choices, organized by location

Mode	One Time Cost	Cost Per Mile	CO2 (lbs) Per Mile	Per person one-time cost
Walk	$0.00	$0.00	0.00	0
Personal Bike	$0.00	$0.00	0.00	0
S.O.V	$0.00	$0.60	0.83	0
Bus (peak)	$1.25	$0.00	0.18	1
Bus (average)	$1.25	$0.00	0.82	1
Bus (off-peak)	$1.25	$0.00	1.46	1
B-Cycle (<30 min)	$5.00	$0.00	0.00	1
B-Cycle (31-60 min)	$7.00	$0.00	0.00	1
Community Car (<60 min)	$10.00	$0.00	0.51	0
Union Cab (>1 mi)	$5.95	$2.80	0.51	0

Table 2: Data chart for transportation choices, organized per person, per mile

Notes

Conclusive carbon emission data was difficult to ascertain for different transportation modes. Distances are also subject to vary slightly depending on the route and transportation mode. To standardize our results, distances are determined by routes taken by car on google maps. An additional variable we could highlight in our research is the transportation choice filtered by the season. We would expect that staff use more sustainable transportation choices in warmer weather seasons.

Conclusions

Bike vs. Bus

Bicycles and Metro Buses are often considered as two of the more sustainable alternative modes of transportation. Our projected data suggests that bus transport takes longer than bicycle transportation. However, the largest time range between bus and bike is 15 minutes, which means in harsher weather conditions a bus is a suitable substitute. Public transportation is a more sustainable choice with more occupants and shorter travel times.
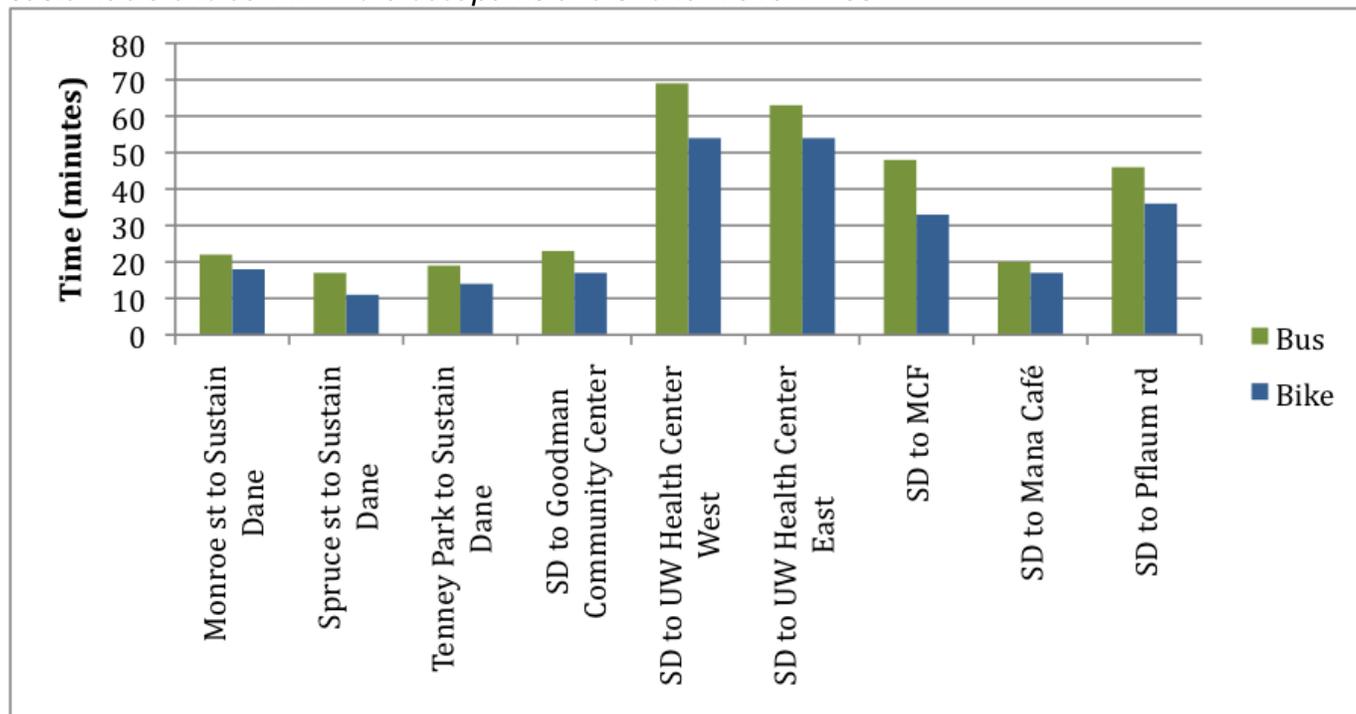
Cars

Single Occupancy Vehicle vs. Ride-Sharing

Ride-sharing and carpooling are becoming ever popular with today's commuting class. By using basic logic we can examine select reasons that ride-sharing is typically a more sustainable option than driving alone.

- Carpooling reduces gas and parking expenses by at least 50%
- Fewer cars on the road results in an overall reduction in GHG
- Carpooling reduces some pollution which increases the overall population's health
- Studies show carpooling reduces stress because of the company

Hybrid vs. Conventional

A 2012 study funded by the California Air Resources Board found that "in terms of environmental impacts, the BEV (battery electric vehicle) was determined to have the least overall impact, followed by the hybrid, and lastly the CV (conventional gasoline vehicle). (Aguirre 2012).

This graph below, from a Chester et al. study in 2012 measures the grams of CO2—equivalence per passenger mile traveled in a transportation life cycle analysis. The data shows that bus rapid transit and light rail emit lower CO2 levels in both the near and long-term.

Chester et al. (2012)

LA Sedan (Near–term)
LA Orange Line Bus Rapid Transit (Near–term)
LA Gold Line Light Rail (Near–term)
LA Sedan (Long–term)
LA Orange Line Bus Rapid Transit (Long–term)
LA Gold Line Light Rail (Long–term)

Telecommute

An option for businesses and organizations to consider in certain circumstances is telecommuting. This is a particularly lucrative option for conference calls, bad-weather days, and organizations with limited office space.

Recommendations

Use our tools <http://sustaindane.org/going-sustainable/at-work/business-resources/alternative-transportation1/>

Works Cited

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