2030 District Transportation Survey

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Executive Summary

We worked with the Ann Arbor 2030 District to update, advertise, distribute, and analyze the A2 2023 district transportation survey. The survey is conducted every two years to track district progress toward the goal of reducing greenhouse gas emissions related to commuting by 50% by 2030. In collaboration with Jan Culbertson, the leadership chair for the 2030 District, we spent the first phase of our project advertising the survey to members of the district through newsletters and emails in order to grow our contact list of building partners. In the second phase, we provided edits to the original survey that was created in 2020 by a project team of graduate students at the School of Environment and Sustainability at the University of Michigan to reconcile the questions with a post-COVID lifestyle. In the third phase, we distributed one survey to our building partners and one survey to the city of Ann Arbor who each disseminated the survey to their employees and sent reminders to partners to encourage participation. In the final phase, we collected and analyzed the data from the 319 responses on the general business survey and the 29 responses on the city-specific survey. The goal was to provide building partners with an email containing statistics regarding their building's transportation emissions.

The survey focused on weekly and annual emissions per respondent and building, and it provided insight into participant willingness to change transportation habits based on various incentives. Specifically, the survey asked participants whether they are willing to purchase an electric vehicle, if they've considered purchasing an electric vehicle, or if a variety of policies would incentivize them to change their transportation habits to decrease personal emissions. The policies in question included: increased bike racks, parking or storage, bus stops closer to the workplace, free or subsidized public transportation, expanded work-from-home policies outside of COVID-19, on-site childcare, installed electric vehicle charging at the workplace, financial incentives to carpool, a shared company vehicle (like ride home programs), more affordable housing closer to the workplace, better bicycle infrastructure (e.g. protected lanes, paths), and a bus service closer to home.

The reduction of transportation emissions is essential to combatting the climate crisis. The A2 2030 District can use the information provided by the survey to benchmark current transportation emissions in the city and plan for policy strategies to reduce future emissions. The policies that saw the most interest included subsidized public transit, expanded work from home policies, incentives to carpool, and affordable housing. The City of Ann Arbor and the District can now use this information to incentivize future emissions

reductions, and building partners can use this information to hopefully provide new incentives to employees in the city to reduce their emissions.

Introduction and Background

As previously stated, we worked with the Ann Arbor 2030 District to update, advertise, distribute, and analyze the 2023 district transportation survey. This project was a revival of the 2030 District transportation survey disseminated by SEAS students and faculty in 2020. Our survey made all necessary changes to reflect post-pandemic responses, and also expanded on the survey with two new questions. These new questions included a comparison of the respondents pre and post-COVID-19 commuting habits, as well as a question concerning the likelihood the respondent would purchase an electric vehicle in the near future.

This survey acts as part of the emissions benchmarking process for the Ann Arbor 2030 District's initiative, and the 2023 version specifically served as the first glimpse into employee commuting habits after the pandemic. It symbolized a way to understand the effect the pandemic may have had on employment policies, housing, and transportation habits in general for the city of Ann Arbor.

In this report we will detail the methods used to achieve our project goals, the deliverables we produced, the recommendations we drew from survey results, and the anticipated impact of the newly updated Ann Arbor 2030 District transportation survey.

Methods

Marketing

We issued newsletter blurbs in the November and December 2030 District newsletters to gauge interest in the survey among buildings in the 2030 District. We advertised the three Zingermans gift cards that would be raffled off between general building participants and city participants. The page-long blurbs detailed the timeline for the survey and the environmental and personal benefits that such a survey could provide for both participants and the city of Ann Arbor.

Updates

We participated in a zoom meeting with the SEAS graduate students who wrote and distributed the 2020 transportation survey so they could explain the survey and the 2020 results. We then made a series of edits to the original survey to reflect the fact that transportation habits would have changed since the height of the COVID-19 pandemic. The questions needed to reflect the fact that less people would be working from home and more people would be commuting into the office, but we also wanted to see what changes respondents made going from pre-pandemic transportation to post-pandemic transportation.

Distribution and Engagement

We sent the survey to each building partner that requested the survey for their building and we sent a separate, slightly different survey to our contact for the city of Ann Arbor. We sent routine emails to check-in on building partners and ensure that deadlines were being met and check to see if the survey deadline had to be extended to increase engagement. Participation was not at the level previously anticipated so a couple rounds of emails were sent to encourage participation.

Aggregate and Analyze Data

First we compiled data on mileage of average commute, average weekly emissions per respondent, average annual emissions per respondent, and average total annual emissions per building. Then we looked at average number of days a given employee in this survey commuted to work or worked from home before, during and after the COVID-19 pandemic and found averages for commuting before the pandemic, telecommuting before the pandemic, commuting during the pandemic, telecommuting during the pandemic, commuting present day, and telecommuting present day. Lastly, we calculated what percentage of respondents would change their habits if each of the eleven aforementioned policy incentives were offered.

Results

We then emailed the survey results to each of our building contacts to give them a comprehensive overview of their building's transportation habits and emissions as well as how they compare to the transportation habits and emissions of all respondents. We sent out 15 reports in total, including one that encompassed all of the city's buildings.

Deliverables and Recommendations

The data collected by the 2023 Transportation Survey was intended to serve as a comparison to pre-COVID-19 transportation habits, as well as offer general insight into the Ann Arbor business sector.

Commuting Numbers

For the district as a whole, the average one way commute length to work was 11.85 miles, and the average annual emissions per commuter was roughly 1.93 tons of CO2e. This number was calculated using the commute length and transportation mode of each respondent, each of which has an accompanying emissions factor from the GREET database. The most common transportation mode was driving alone, with 81.72% of respondents (See Figure 1). The average number of days that employees commute to work was approximately four days per week, which signified a decrease by one day from pre-pandemic numbers. Despite this one change, the rest of the aggregate data presented quite similarly to the data collected by the 2030 District Transportation Survey conducted in 2020 (Fields et al. 2021).

Aside from the collective data, individual analysis was also carried out for each building that participated in the survey. We were able to view the average commute lengths, emissions, mode split, etc. for each building side by side with the total district, as well as with a percentage difference in these numbers (See Figure 2). The Baseline Toolkit provided by the previous Transportation Survey team also included graphics to compare these numbers as well (See Figure 3). The greatest interaction with the survey came from Zingerman's, with over 145 responses across their different participating buildings.

Parking

The 2023 Transportation Survey also calculated aggregate and individual data on parking access at Ann Arbor places of work. For the total district, about 87% of respondents had access to free parking at work, with paid parking following at 8%, street parking at 4%, and no parking at 1%. The previous team for 2020's administration of the survey did not report data covering parking access in Ann Arbor, so it is inconclusive whether this subject has changed over the course of the pandemic.

Policy

Arguably one of the most important components of the data collection included information on respondents' policy preferences. A variety of policy options were presented to respondents, such as increased work from home capacity, increased childcare support, and

affordable housing, among others. Of the presented options, the most favored policies in order of decreasing support were: expanded work from home policies, affordable housing, incentives to carpool, and a shared company vehicle (See Figure 4). In the previous survey's results from 2020, roughly 61% of respondents noted that increased work from home capabilities would change or be likely to change their commuting behavior. The only other policy with heightened support (at 11% of respondents) was incentivizing carpooling. Comparing these results to our own, both carpool incentivization and company vehicle policies received much greater support in 2023. Affordable housing was not offered as a response in 2020, however the previous team advocated that the city investigate this as an option (Fields et al. 2021). Given this information, we would recommend to the 2030 District and the City of Ann Arbor that advocating for and proposing policies to expand work from home capabilities and increase affordable housing in the downtown area are likely to be the most effective methods to reduce transportation emissions. Investigating carpool incentives and company-owned vehicles stand as a close third and fourth option.

Impact

How the 2030 District will use our findings:

Moving forward, our work will be utilized to form recommendations for the city of Ann Arbor. Transportation emissions have been benchmarked since COVID. With the help of our developed and updated transportation survey, the Ann Arbor 2030 District and the city of Ann Arbor will be able to continue benchmarking transportation emissions caused by commuting to and from work buildings throughout the city. Our survey is easy to update due to its format on Google Docs, and our Excel formulas are easy to replicate as well. Therefore, it will be usable for years to come.

UN Sustainable Development Goals addressed by this project:

The primary UN Sustainable Development Goal (SDG) addressed by this project is goal #11, Sustainable Cities and Communities. The topic of sustainable transport is a key aspect of this goal (*Sustainable Transport,* n.d.). Transportation is a major driving force behind the growing demand for energy worldwide, and is one of the main areas where change can be made. Utilizing public transportation and even carpooling contributes to reduction of greenhouse gas emissions. Greenhouse gas emissions from transportation accounts for 29% of total US greenhouse gas emissions, making it the single largest contributor (*Transportation, Air Pollution, and Climate Change,* n.d.). Therefore, by calling attention to the modes of transportation used daily across a city as large as Ann Arbor with the purpose of contributing to emissions reductions efforts, we are directly addressing the need to make cities more sustainable through the route of transportation.

Goal #13, Climate Action, is addressed by our project as well. By calculating the emissions of Ann Arbor buildings, we actively took small steps towards combating climate change and its impacts. The specific climate change impacts addressed include warming and pollution from greenhouse gas emissions that come from automobile fuel.

Lastly, our work touches on principles addressed by Goal #9: Industry, Innovation, and Infrastructure. One component of this goal is sustainable industrialization. Industrialization typically goes along with improvements in technology and infrastructure as well as urbanization, and is closely tied to impacts from carbon emissions. Our work is only necessary because of past urbanization of the city.

Acknowledgements

We would like to extend a special thank you to our mentor Jan Culbertson who has guided our team through every step of the 2023 Transportation Survey project. She offered extensive guidance and support as we navigated through all of the different components of this project. It was an honor to work on an interdisciplinary project that incorporated her expertise in sustainability and the Ann Arbor business community, as well as the influence of business owners, employees, city officials, and several others who genuinely care for the 2030 District's mission.

We would also like to thank the previous SEAS students and faculty, Jeffrey Pritchard, Tess Fields, Sivah Akash, and Dr. Geoffrey Lewis, for providing us with the Instructions, Analysis Models, and Toolkit necessary in order to complete this year's survey. The thoroughness and thoughtfulness shown in their work was invaluable.

Last but certainly not least, we would like to extend gratitude to the Graham Scholars leadership team, namely Bridget Gruber and Megan McLaughlin, for checking in on us throughout our project and offering support whenever needed. They provided us with the proper tools and advice to have a successful experience in Graham Scholars, and we could not be more appreciative.

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Appendix

Figure 1: Total District Mode Split

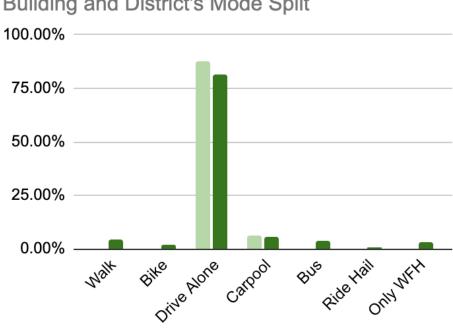|	
Trips made up of walking:	4.11%
Trips made up of biking:	1.72%
Trips made up of driving alone:	81.72%
Trips made up of carpooling:	5.67%

Trips made up of taking the bus:	3.95%
Trips made up of ride hailing:	0.68%
Respondents who only work from home:	3.10%

Figure 2: Numbers for the High Point School by Numbers for Total Ann Arbor District

Metric	High Point School: 1819 S. Wagner Rd.	Total District	Percent Difference Between Total District and High Point School: 1819 S. Wagner Rd.
Number of survey respondents:	17	282	NA
Per commuter annual emissions (kg CO2e):	2,057.96	1,752.58	17%
Per commuter cold weather emissions (kg CO2e):	1,063.35	896.09	19%
Per commuter fair weather emissions (kg CO2e):	994.61	859.83	16%
Average commute length (mi):	24.19411765	23.71855346	2%

Average number of commuting days:	4.529411765	4.043887147	12%

Figure 3: Mode Split for the High Point School (Light Green) by Total District (Dark Green)

Figure 4: Policy Preferences for the Total District

	Policy Preferences		
	Likely to or will change behavior	Not likely to or will not change behavior	Already has access
Bike Storage:	4.17%	85.72%	6.30%
Bus Stops:	6.80%	80.83%	8.48%
Subsidized Public Transit:	12.69%	75.31%	6.12%
Work from Home:	35.09%	54.42%	5.56%
Childcare:	5.77%	91.35%	0.73%
EV Charging:	3.85%	81.55%	1.30%
Carpool Incentives:	21.60%	65.90%	1.57%
Company Vehicle:	19.92%	66.50%	0.23%
Affordable Housing:	24.91%	69.98%	2.19%