

Transforming Urban Logistics with Cargo E-Bikes

Humphrey School Capstone Report

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The University of Minnesota

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Executive Summary

Transforming Urban Logistics with Cargo E-Bikes A University of Minnesota Capstone Project

Context and Background

The purpose of this project is to identify opportunities to replace traditional vehicles with smaller, more cost-effective, and zero-emission electric alternatives for cargo movements. Cargo e-bikes address vehicle miles traveled (VMT) and greenhouse gas emissions (GHG) reduction in transportation, two major issues that transportation planners and advocates seek to reduce.

We partnered with Civilized Cycles, a manufacturer of cargo e-bikes designed for urban logistics and deliveries, and Towerside Innovation District. Towerside Innovation District, located in the Prospect Park neighborhood of Minneapolis, serves as an effective site for this study as a dense, transit-oriented community. The findings from this report are needed to support expanded use of sustainable alternative fleets in urban areas. We also use these insights to suggest infrastructure and policy changes for scaling the use of e-cargo bikes.



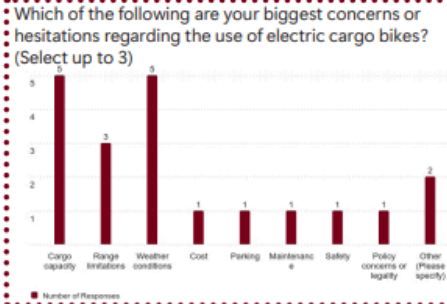
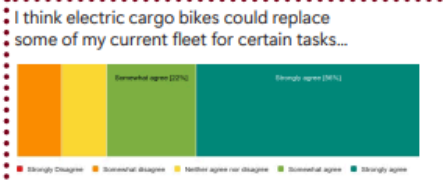
Method



Survey Results

Which of these light e-cargo freight vehicles would be most useful to add to your fleet? (Select all that apply)

-
-
-
-
-
-
-
-



Cargo capacity is a major indicator of a business' fleet choices, and the perception of e-bikes' low carrying capacity needs to be changed for more businesses or organizations to adopt e-bikes. **Low cost** of e-bikes provides a major advantage in business' fleet decisions.

Respondents provided a wider **range of possible uses** for cargo e-bikes than was initially considered. Most respondents also stated that their most common deliveries or trips are **within five miles**, which is a feasible distance for e-bike travel. **Weather** remains a major barrier to further e-bike adoption, especially in places like Minnesota.

Credits:
Master of Urban and Regional Planning Students: Ethan Buss, Danica Dosmann, Soren Dunn, and Madeleine Logeais

Transforming Urban Logistics with Cargo E-Bikes

A University of Minnesota Capstone Project

Interviews

Bakery

Used e-bikes for bread deliveries for 10 years

Transit Agency

E-bike pilot program for updating and maintaining bus stop signage

Manufacturing Company

Uses e-bikes for maintenance of dispersed sites and short deliveries

"Frankly, people aren't chomping at the bit to get out when it's super cold. So I do think the weather is the biggest challenge to sort of having this operationalized 365 days a year."

~Transit Agency on Weather

Weather

- Safety, comfort, and operational concerns can sometimes limit use

Marketability

- Bikes build community
- Element of uniqueness
- Supporting environmental values

"As a business, it gets you recognition that you wouldn't get ... [a TV reporter said] 'your bread is really good, but we're here because of the bikes.'"

~ Bakery on Marketability

Cost and Acquisition

- Affordable procurement and maintenance costs is an advantage
- Easy acquisition and maintenance

Employee Wellbeing

- Employee happiness is a primary motivation for e-bike adoption
- Workplaces consider employee safety and comfort

"And it wasn't so much like a conscious choice. It was just like we have these. We love riding our bikes. Let's try to use them as much as we can."

~Manufacturing Company on Wellbeing

Efficiency

- Help avoid parking and traffic
- Preparation avoids battery capacity limitations

"We could probably hit more stops on a [transit line] audit on a bike because you could roll up, just, you know, kind of stand there for a second dig out the iPad, take the photos, do the documentation, pop it back in the basket and go."

~Transit Agency on Efficiency



Recommendations

Interviewees highlighted several ideas for advancing cargo e-bike adoption and addressing current needs. Policies that promote **secure parking** and **bike lane improvements** would be beneficial for e-bike riders. Additionally, multiple people expressed **opposition to regulations** such as license and registration requirements for e-bike riders that would make adoption more difficult. **Shared e-bike fleet** and **storage** for businesses close together would help business e-bike adoption. E-bike technology improvements should focus on **cargo capacity** and **weather protection**.

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Introduction

Electric bicycle (e-bike) availability and popularity has increased rapidly over the past decade.¹ E-bikes require less effort and are easier to operate at a higher speed than traditional bicycles, so e-bikes present a new lower barrier to using bicycles and stronger competition against other transport modes. As a reaction, there has been wider adoption of e-bikes, even in cities that lack the highest employment and population densities.²

Cargo e-bikes, a type of e-bike with additional carrying capacity, have also seen market growth in recent years, with more people using these styles of bikes to carry groceries, children, or other items in their daily lives.³ However, there has been little discourse that considers cargo e-bikes as a part of commercial fleets. With more and better cargo e-bikes available, there are now expanded opportunities to add e-bikes to commercial fleets for first- and last-mile deliveries and other uses. Greater adoption of e-bikes is also not limited to the biggest, most densely populated cities. In less dense metropolitan areas, like the Twin Cities, e-bike adoption for commercial fleet purposes may still be viable. In fact, multiple businesses and agencies have already adopted e-bikes in their business practices to various extents.

This report aims to provide a first analysis of the feasibility and likelihood of e-bike adoption for commercial fleets in the Twin Cities. In doing so, the project included two forms of outreach. A survey was sent to a wide range of fleet operators in the Twin Cities area to better understand their current fleet sizes and practices. This survey also introduced fleet operators to cargo e-bikes and gathered information on their opinions toward e-bike adoption. Then, interviews were conducted with five past or current e-bike users for fleet operations. All interviews were structured with the same list of questions, and responses provided insights into the benefits and challenges of using e-bikes in a business or organizational context.

¹ Department of Energy. 2023. "FOTW #1321, December 18, 2023: E-Bike Sales in the United States Exceeded One Million in 2022." Energy.gov. United States Department of Energy. December 18, 2023.

<https://www.energy.gov/eere/vehicles/articles/fotw-1321-december-18-2023-e-bike-sales-united-states-exceeded-one-million>.

² Kraker, Dan. 2023. "Minnesota's New Rebate Powers up 'Year of the E-Bike.'" MPR News. May 26, 2023.

<https://www.mprnews.org/story/2023/05/26/minnesotas-new-rebate-powers-up-year-of-the-ebike>

³ Marti, Mary Morse. 2024. "An Ode to Electric Cargo Bikes." Streets.mn. February 6, 2024.

<https://streets.mn/2024/02/06/an-ode-to-electric-cargo-bikes/>.

Through these surveys and interviews, we draw the following major conclusions. First, current fleet operators put a high value on cost and carrying capacity when making choices about fleet types. Existing and prospective users of e-bikes noted cargo capacity as a potential issue with e-bikes. However, cost was not a major concern, likely due to a lower purchasing cost of a cargo e-bike compared to traditional cargo vehicle alternatives. Procurement of e-bikes can also be easier than purchasing a truck or van, especially if businesses are purchasing customized fleet vehicles. Second, weather is a major concern for participants when considering adoption of cargo e-bikes. Snow, ice, extreme cold, and thunderstorms are examples of conditions that current e-bike users mentioned having difficulty with, and this provides a barrier to greater adoption of e-bikes. Third, cargo e-bikes can be used for a wide variety of uses: not just deliveries. Out of five interviews conducted with cargo e-bike users, only one was with a business that used cargo e-bikes for delivery of goods. Other interviewees instead used bikes for light maintenance, audits, infrastructure installation, and internal movement of items. Fourth, cargo e-bikes can be as efficient or more efficient than traditional fleet vehicles in shorter-distance settings. Bikes do not require the same amount of time to park, and may have additional route opportunities that are not open to motorized vehicles. There were multiple other key findings from interviews with current e-bike users, including a boost to employee happiness and enhanced brand awareness stemming from e-bike use.

We draw several recommendations from these findings. Policy leaders can support e-bike adoption through improved infrastructure and e-bike parking availability. Multiple interviewees suggest that policy leaders should also avoid overregulation of e-bike use to support greater adoption, specifically by not requiring drivers licenses or vehicle registrations for e-bikes. Agencies or other public sector organizations can be leaders in e-bike adoption, as many have mandates for sustainability and difficult fleet procurement processes that can be avoided by acquiring an e-bike instead of traditional fleet. Further adoption of e-bikes can be promoted by better discussing the benefits of e-bikes with businesses, and innovations like shared fleets could give businesses opportunities to give e-bikes a first try without greater commitment. Finally, e-bike manufacturers should focus on increasing cargo capacity and providing weather protection for cargo e-bikes to promote greater e-bike adoption by fleet operators. Our findings show great potential for further use of e-bikes in the near-term, especially as the benefits of cargo e-bike use become more apparent to potential users based on the insights of early adopters.

The report will proceed with the following sections. First, we will provide background on the project, the clients, and the goals of the research. Next, the report will outline the methods used for this study in greater detail. Third, the report will discuss the findings of the research. We will first discuss the findings related to businesses and fleet operators more generally before reviewing findings from fleet operators that currently use or have used e-bikes. The report will then provide recommendations for policy, greater adoption, and e-bike technology. Finally, the report will close with limitations, recommendations for future research, and a conclusion.

Problem Statement

Urban freight transport has been under-researched in transportation studies, and therefore large portions of the business community and the general public have yet to consider innovations in this area. This lack of research and innovation has cost businesses time and money. For example, parking of large trucks and congestion in dense urban areas is inefficient for businesses, especially as many businesses use vehicles that are larger than necessary for their last-mile connections.⁴ Current freight transportation practices also damage our public resources and significantly contribute to climate change. Freight vehicles contribute heavily to the wear and tear of roads and bridges. Transportation also accounted for 28% of all greenhouse gas (GHG) emissions in the United States in 2022,⁵ with medium and heavy-duty trucks producing 23% of transportation emissions.⁶ Fuel costs of the most popular current delivery methods are also quite high. Our clients, Civilized Cycles and Towerside Innovation District, are considering alternatives to remedy some of these issues.

With recent improvements to e-bike technology and increases in e-bike use for personal trips, groups like Civilized Cycles and Towerside Innovation District are exploring opportunities to expand e-bike use to commercial and freight trips. In particular, the clients

⁴Kim, Haena (2021). Modeling of Urban Freight Deliveries: Operational Performance at the Final 50 Feet. University of Washington Ph.D. Dissertation.

Dalla Chiara, Giacomo and Alho, André Romano and Cheng Cheng, Moshe Ben-Akiva and Cheah, Lynette. "Exploring Benefits of Cargo-Cycles versus Trucks for Urban Parcel Delivery under Different Demand Scenarios." Transportation Research Record, (May 2020). doi:10.1177/0361198120917162.

⁵EPA. 2025. "Sources of Greenhouse Gas Emissions." United States Environmental Protection Agency. March 31, 2025. <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>.

⁶EPA. 2024. "Fast Facts on Transportation Greenhouse Gas Emissions." United States Environmental Protection Agency. June 18, 2024.

<https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions>.

believe there are opportunities to leverage cargo e-bikes for short distance trips in the Twin Cities. Use of cargo e-bikes may be more affordable, avoid issues over parking, and could provide businesses with a more sustainable way to conduct business. This report further analyzes the potential for cargo e-bike use in the Twin Cities and provides recommendations to enhance its potential for widespread use.

This report aims to help answer a series of questions related to urban freight in the Twin Cities. First, what are the current freight delivery needs and challenges for business owners in the Twin Cities? Answers to this question will provide context and information for future freight research in the Twin Cities. Second, what successes and failures have early adopters of cargo e-bikes experienced? These successes and failures can provide lessons to future adopters as interest in cargo e-bikes expands and as bike options improve. We also aim to understand how feasible and desirable cargo e-bike adoption is for local business owners, and if there are opportunities to expand cargo e-bike adoption among fleet operators in the Twin Cities. Finally, this project aims to provide recommendations for policy and technological changes that are required to make e-bike adoption more attractive to fleet operators.

Project Background

Clients

This report fulfills the capstone requirement for the Hubert H. Humphrey School of Public Affairs. As a part of the project, the student team was matched with a pair of clients for the exploration of e-bike use for freight transportation. The first client of this report is Civilized Cycles, an e-bike manufacturer and creator of the new “Semi-Trike”. Civilized Cycles are attempting to better understand the market for new innovations in sustainable transport. The Semi-Trike’s goal is to fill a gap in urban freight transportation by using e-bikes to transport freight over short distances. The trike has a cargo capacity of 1,000 pounds, can reach speeds of up to 15 miles per hour, and takes up significantly less space than semi-trucks or typical cargo vans. Findings from this report will support Civilized Cycles in their goals to expand cargo e-bike use in the Twin Cities and North America.

The second client of this report is Towerside Innovation District, a place-based economic development nonprofit in the Prospect Park and Saint Anthony Park neighborhoods of Minneapolis and Saint Paul. The innovation district was created with enabling legislation from the city councils of Minneapolis and Saint Paul which authorize city staff to consider

pilot projects and experimental policy changes in the area.⁷ The Towersie district is situated along University Avenue and the Green Line Light Rail in Minneapolis, making it a prime area for transit-oriented development and innovations in short-distance transportation methods. In addition, Towerside Innovation District is in close proximity to the University of Minnesota, and the district has a close relationship with the University. Towerside also has relationships with other neighborhood and innovation groups in the area: particularly with the Creative Enterprise Zone, another local organization along the Green Line. With the growth of Towerside Innovation District, parking and vehicle dwelling have become major issues in the area.

Towerside is looking for innovative ways to alleviate parking issues, including with new freight delivery methods. The district also hopes to embrace new methods of freight transportation (such as e-bikes) as a way to reduce greenhouse gas (GHG) emissions and vehicle miles traveled (VMT) among area businesses and to support innovation in the Twin Cities.

Methodology

The project team used a pair of methods to better understand the current freight needs of respondents, along with their first reactions to cargo e-bike use for freight transportation. The team first used a survey that aimed to gather quantitative data from a wide audience in the Twin Cities. The project also included interviews to get robust feedback from a smaller number of stakeholders: particularly businesses and agencies that have already been using cargo e-bikes for some aspect of their work. Using these two engagement methods, this report includes both qualitative and quantitative contributions to cargo transportation research.

Survey

The project team distributed a survey to a wide range of Twin Cities businesses, organizations, and agencies. We created a survey flyer that included the survey purpose, reasons to take the survey, a QR code and link to the survey, and a point of contact for questions. This survey flyer was included in email, LinkedIn, and in-person engagement (see Appendix C).

⁷ Minneapolis City Council. 2015. "University Avenue Innovation District redevelopment (2015-00954)" <https://lms.minneapolismn.gov/Download/PriorMetaData/-52873/2015R-402.pdf>

The project team directly emailed 26 individuals with roles related to business or fleet management in the Towerside Innovation District and Creative Enterprise Zone. A template was created for the text of the email that the team members used, and team members made minor wording modifications to the template as desired (see Appendix D). We sent up to three follow up emails to each contact.

We also leveraged connections with transportation organizations in our networks to distribute the survey. For example, Move Minneapolis posted the survey link and description on LinkedIn, and a member of MnDOT circulated the survey within his department. Clients and the capstone team also used industry connections to gather survey responses. Groups reached out to through past connections included Move Minnesota, Metro Transit, the Metropolitan Council, and Cyclehoop, Spin, and Peace Coffee.

Another method of survey distribution was in-person distribution of survey flyers directly to businesses in the Towerside Innovation District and Creative Enterprise Zone. These interactions ranged from workers who agreed to pass the flyer along to their managers to direct conversations with managers. The project team dropped off 19 flyers in-person. Businesses reached through the flyer distribution include: Surly Brewing, O'Shaughnessy, Fresh Thyme, Feng Cha, Urban Wok, The Textile Center, the individual businesses within Malcolm Yards, and Urban Growler, Bang Brewing, Dual Citizen Brewing, and Hampden Park Co-op (a grocery store).

Questions were focused on a trio of main themes: background on the business or organization surveyed, the business' or organization's current fleet size and delivery issues, and the business' or organization's perception and attitudes toward the adoption of cargo e-bikes (see Appendix B). The survey gathered a total of 21 respondents during the 23 day survey period, and the results of this survey are further discussed in the "Findings - General Fleet Operators" section of this report.

Interviews

At the end of the survey, we included a question asking respondents if they would be interested in participating in a short follow up interview. If a respondent marked interest, they were directed to provide their contact information. We also recruited interview participants through email inquiries.

Interviews were in pairs, with one member of the team leading the interview and the other taking notes and asking some follow up questions as needed. Those who participated in the interviews were given one of two different lists of questions, depending on whether they were current users of e-bikes or not (see Appendix A). Interviews were also recorded with the participant's permission. The list of questions were provided to two organizations that were not able to attend interviews due to schedule conflicts, and they provided written responses. Findings from the interviews are included in the following sections.

The original project scope included conducting focus groups in Towerside Innovation District to contribute to qualitative findings. Due to issues with gathering enough participants, the project team altered the method of qualitative research to interviews (see Appendices E, F, and G for Focus Group information). Questions intended for focus groups were adapted to be used for interviews with businesses that did not have experience using e-bikes for business purposes.

Sharing Findings

We shared our findings at a tabling display at the Earth Week Water Party at Malcolm Yards in Minneapolis on April 23, 2025. This event, which was co-hosted by the Metropolitan Council, Freshwater, and Towerside Innovation District, was open to the public and was aimed at learning about and celebrating environmental work in the region. At this informal presentation, we solicited engagement from community members by asking them to write their answers to a pair of engagement questions (Appendix H) and vote with stickers for which e-bike appealed to them most for moving cargo.

Findings - General Fleet Operators

Respondent Backgrounds

There were 21 responses recorded over the survey period, with 13 of those respondents completing the entire survey. Of those 13 respondents, a majority were either from the transportation, warehousing, or manufacturing industries (8). However, other industries were included, such as food service (2), real estate (1), and professional services (1). Of the total respondents, 62% currently have fleet that they use for some business purpose. Multiple of the surveyed respondents also took part in the interview portion of this project. Findings of the interviews are included later in the report.

Multiple respondents also have a history of using sustainable fleet vehicles and/or e-bikes for their fleet needs. For example, five respondents considered themselves to be “operators of electric or sustainable fleet vehicles”. In addition, four respondents have already used an e-bike for some aspect of their business or organization. The survey’s overrepresentation of current sustainable and/or e-bike fleet operators contributed to multiple interesting findings and considerations for the future of cargo e-bikes.

Major Purchasing Factors - Cost and Capacity

Survey respondents viewed two main factors to be the most important in determining their fleets: cost and capacity. Businesses and organizations are fiscally constrained, making cost and capacity crucial for their success. Business and organizational openness to alternative fleet operation methods will thus only be viable as long as it meets a business’ needs for cost and cargo capacity.

Business’ fleet composition needs relate with concerns over e-bike adoption in key ways. Notably, respondents' main concerns about the adoption of e-bikes only reflected one of the two main considerations of fleet composition. Five out of nine (56%) survey responses cited cargo capacity as a main concern of e-bike adoption. Because cargo capacity was also a key factor in business’ decision-making over fleet vehicles, capacity presents itself as the number one area where growth is needed in e-bike technology. Additionally, this response shows a perception about cargo e-bikes that will need to be addressed once solutions are created to allow for higher carrying capacity. Until both the technology and the perception around e-bikes as “low capacity” are addressed, the maximum potential for e-bike usage in business’ fleets will not be fully realized. However, it is notable that concerns or challenges with cargo capacity was not a significant theme in interviews with current e-bike users.

Cost was not registered as a major concern of e-bike adoption by survey respondents. Only one out of nine (11%) respondents answered that cost was one of their top three concerns with e-bike use. This large gap between how many respondents prioritize cost in fleet considerations and how many respondents view cost as a concern with e-bike adoption indicates a large potential selling point for e-bike use in fleets. E-bike manufacturers and supporters of greater e-bike adoption in fleets should therefore highlight the significant savings that e-bikes provide over other cargo vehicles. Findings from current e-bike users show further examples of the benefits of cost difference between e-bikes and other vehicles for fleet use.

Weather - A Second Key Barrier to E-Bike Adoption

Another key concern of survey respondents with e-bike fleet adoption was weather. With the survey taking place in the Twin Cities during March, this was an anticipated result of the survey. Weather was listed as a top concern for e-bike adoption by five out of nine survey respondents. Four responses additionally answered that some form of weather protection would be an essential feature for e-bikes to be viable for their operations. This result shows that e-bike fleet adoption may be more difficult in areas with volatile weather conditions in the near-term. Many businesses that do add e-bike fleet will also likely require some form of traditional fleet, such as vans, for occasions where the weather makes biking uncomfortable or unsafe.

Some cargo e-bike manufacturers are working to address concerns about weather. For example, Civilized Cycles has provided a weather cover in some scenarios to e-bike purchasers. Early e-bike adopters like Andy Lambert from Cyclehoop see major benefits to weather protection covers. Further takeaways from early e-bike adopters on weather are in the next findings section. E-bike manufacturers will need to consider opportunities to incorporate weather protection in their vehicles to mitigate weather challenges.

Unexpected Theme - Creative E-Bike Uses

In addition to the main themes of cost, cargo capacity, and weather, the use cases of e-bikes were an unexpected result of the survey. Multiple businesses that use or would consider using cargo e-bikes would use e-bikes for cases other than deliveries or employee movement. For example, one respondent cited transportation of outreach supplies to or from events as a possible use case for cargo e-bikes. Another respondent answered that light maintenance and audit work were feasible business uses of bikes. In addition, a respondent answered that they could use e-bikes to deliver equipment for installation of their products. These examples show that cargo e-bikes could be adapted to a wide range of uses, and are not limited to solely delivery of goods or movement of people. Businesses or organizations that are interested in cargo e-bike adoption should be open-minded about different potential use cases within their usual work responsibilities.

Survey Findings Summary

The survey findings indicate that e-bikes are a more viable option for fleet operations in certain use cases than one may expect. E-bikes have a significantly lower cost than other delivery or fleet vehicles, providing a major advantage in a key factor of business' fleet decisions. In addition, respondents provided a wider range of possible uses for cargo

e-bikes than was initially considered in this project. Uses for e-bikes can expand beyond just deliveries or employee movement, and can include light maintenance, installation, and community engagement. A majority of respondents also stated that their most common deliveries or trips are within five miles, which is a feasible distance for people to travel via e-bike.

Despite the positive aspects of e-bikes, there are still barriers to wider adoption. First, cargo capacity is a major indicator of a business' fleet choices, and e-bikes are largely unable to carry the same amount of cargo as a traditional fleet vehicle (such as a van). This finding suggests that e-bike manufacturers need to work toward creating e-bikes with greater capacity, but it also shows that the perception of e-bikes' low carrying capacity needs to be changed for more businesses or organizations to adopt e-bikes. Second, weather is a major barrier to further e-bike adoption, especially in places like Minnesota that experience colder winters and have snowfall or ice that make e-bike use uncomfortable and sometimes unsafe. Some improvements may be possible to address this issue, but weather will likely be a long-term problem for further business and organization e-bike adoption. Further graphs and maps from the survey results can be found in Appendix I.

Findings - Early E-Bike Adopters

We interviewed five businesses and organizations that have utilized an e-bike fleet for cargo movements, including for delivery and light maintenance tasks. These interviews reveal some of the many benefits of using e-bikes for business and organization needs, as well as considerations for maximizing these benefits and avoiding challenges. The main challenges that interviewees experience are weather-related, limiting year-round use of e-bike fleets. Interviewees expressed significant employee satisfaction with using the e-bikes, and supervisors promoted employee safety and comfort. Use of e-bikes is also helpful in marketing for businesses and aligning with organizational environmental values. E-bikes also have lower purchase and maintenance costs. Interviewees have also found benefits in efficiency with e-bike fleets, avoiding parking and traffic congestion. These businesses and organizations have learned and continue to learn from their experiences with an e-bike fleet, and entities considering use of e-bikes can learn from their insights.

Interview Participant Backgrounds



Photo of a Metro Transit employee using their new e-bike (Source: LinkedIn)

We spoke with Jacob Brown at Metro Transit about the e-bike pilot program in the Transit Information Field Operations department. The pilot officially began at the start of 2025, and this interview took place about three months into the pilot. Prior to the pilot launch, there was a period of research and preparation for obtaining pilot approval. The results of the pilot could be used to inform other departments of opportunities for e-bike use. This department's current fleet contains eight vehicles in total, including one e-bike, one electric van, conventional gas vans, and pickup trucks. Their e-bike is used for audit work, verifying that signs are in good condition along a route, and light maintenance work from the field installers that maintain or update bus stop signs and schedule displays. This is work that does not require hauling heavy tools. The Transit Information department is still figuring out what they can and cannot do with cargo e-bikes through this pilot. They have added a customized rack to their e-bike to hold a compact folding ladder, a custom immobilizer for the rear wheel, and a GPS tracker in case of theft. They have also added some more basic features such as side racks, a basket, and a water bottle holder.



Owners of Brake Bread with a version of their delivery vehicles (Source: Pioneer Press)

Nate Houge, owner of Brake Bread in St. Paul, spoke with us about his bakery's experience using e-bikes for bread delivery. The founders of Brake Bread both came from one car families, so using bikes for their business needs made sense to them from the start. They started delivering with traditional bikes with trailers, and then put e-assist on their bikes around three years in, making their delivery rides much easier. The delivery people were older adults, a mix of men and women, who found that the e-assist was a game changer as routes expanded. The company had four bikes, and two personal bikes were also used by staff, for a total of six e-bikes used for Brake Bread deliveries. Brake Bread has recently found that it was no longer profitable to operate a delivery service, and therefore is not currently using their bikes. Nate Houge expressed that he learned a lot from the 10 years of using bikes for deliveries and would use e-bikes again in the future if they resumed delivery service.

Andy Lambert runs the North American branch of Cyclehoop, a London-based company that designs and manufactures secure bike parking and storage equipment and streetscape furniture. Their focus is fully enclosed, high-density secure bike parking. They

are working on making these facilities available on-demand with an app-enabled smart lock. The North American branch was incorporated in 2022 and is based in Minnesota. While they need to use trucks for their large, long-distance deliveries, Cyclehoop employees use cargo bikes when possible, such as for ongoing maintenance and operations. This includes maintenance of bike hangers and shorter distance deliveries of light cargo. They also expect to use cargo bikes for more tasks as their business expands, such as maintenance for the upcoming secure cycle parking pilot in Minneapolis. They are considering offering a bike valet service for events that could entail delivering mobile or foldable bike racks using cargo bikes. Andy Lambert and his colleague both use their personal cargo bikes. Their parent company in London also has employees using cargo bikes for maintenance checks and cleaning of bike hangers.

We received written feedback from Jimmy Gilman with Spin, an e-scooter and e-bike manufacturer, and John Mark Lucas with the Parking and Transportation Services at the University of Minnesota (UMN). Spin has been using cargo e-bikes for around four years and also uses cargo vans. They use cargo e-bikes for swapping batteries of e-scooters and e-bikes and for moving e-scooters and e-bikes to different locations in a city. UMN Parking and Transportation Services began using their cargo e-bike in January 2025 for moving their fleet of rental bikes for university students and occasionally for moving bike racks and event materials. They also have a regular pickup truck that they use and are still in the early months of testing their cargo e-bike.

Weather

For the Transit Information department at Metro Transit, weather has been the main challenge so far, as their pilot began during the winter. For safety reasons, the team does not use the e-bike when there is lots of snow and ice on the road. People are also less interested in using the e-bike on the coldest days. When the weather is nice, people are eager to use the e-bike for work. Brake Bread also experienced days when weather prevented staff from using the bikes for deliveries, such as days with fresh snow or ice. They put studded tires on the bikes and continued to bike in the winter whenever it was safe to do so, but learned that just because they could bike in inclement weather does not mean that they should. Nate Houge realized that sustaining a business that supports riding bikes as much as possible requires choosing not to ride on days where it could be unsafe. It was up to each individual rider, but some general guidelines included not riding when there was lightning or strong winds.

There are also weather concerns that pertain to an organization's particular conditions, such as their bike set up, local infrastructure and environment, and products. Wind was a more significant concern than snow for Brake Bread, with the potential to tip their trailer when it was empty on return trips and led to a safety hazard, especially as the return trip was downhill. One problem with snow was that streets would get narrower and it could feel unsafe when cars passed on the narrow streets. Bikes are not legally allowed to be ridden on the sidewalks in business districts, although this was sometimes the safest option. Another consideration was that they delivered a fragile product, and so weather complications like rain and icy roads could result in an undeliverable product. Some deliveries were handed off outside, and handing off bread in paper bags in the rain was not a viable option. Additionally, weather that causes bumpy conditions is not ideal for transporting a fragile product such as pastries.



Image of Brake Bread bikes in the snow (Source: Brake Bread)

The weather does get in the way of using bikes for Cyclehoop sometimes, with the snow being too much to pedal through. However, Andy Lambert with Cyclehoop has had minimal issues with weather even in the wintertime. He says that it's pretty easy to stay warm without spending a lot of money, with an insulation layer and a windproof and waterproof layer outside of that going a long way. We also discussed bikes including some sort of enclosure or roof to protect against weather as beneficial elements for improving employee experience.

Interview participants also mentioned preparation for weather conditions. Andy Lambert explained that wearing layers can make biking in the cold weather feasible, and Jacob Brown with Metro Transit mentioned clothing considerations in general of wearing comfortable clothing for biking. Nate Houge with Brake Bread planned ahead to avoid getting stuck in bad weather. He had regular routes, and so he kept a few places in mind of where he could find shelter if it started pouring or the bike broke down while it was cold. He mentions that fixing his bike in the cold is difficult because his hands can start to feel numb, but he can replace his battery with a spare in 12 minutes. Andy Lambert noted that winters are getting a lot more unpredictable now with climate change.

Employee Wellbeing and Safety

The Metro Transit team is also finding the e-bike pilot to be successful in supporting employee morale and wellness. Jacob Brown mentioned that studies have shown that people who spend time on a bike experience mood and health benefits, and so the team used employee wellbeing and satisfaction as part of the rationale for starting this pilot as well, in alignment with Metro Transit strategic goals. Jacob Brown has found that employees are very eager to use the e-bike. The department is working on how to quantify some of the more subjective experiences around using the bikes. This includes documenting how employees feel before and after using the e-bike for each trip, and they are finding that people feel better after using the e-bike. Alongside this information, they are collecting information about the trip, such as what work items were performed and what the weather was like. He referenced his example of an employee's long trip along the Gold Line and said that even though it was a cold and windy day, and the employee came back tired from the high mileage, he still reported feeling good from his ride. The department views the e-bike as an opportunity to promote employee happiness while they complete their work. Additionally, employees are getting exercise while using the bikes, promoting their health. The team is excited about the pilot and the ability to be a part of something new and different.

The Metro Transit team currently only has one e-bike, and there is a lot of interest among the team in using it, requiring additional coordination among employees. There have already been instances where multiple people wanted to use the bike at the same time, and this will likely become more frequent as the weather improves. This requires the team to put more forethought into how they will approach their work tasks. There is even interest from employees in other departments at Metro Transit, but Jacob limited use to the Transit Information Field Operations team in possession of the e-bike. The University of

Minnesota has found that a limitation with using their e-bike is that it cannot transport passengers, and their crew often needs to go out in teams. Their bike also currently lacks storage compartments for personal items.

Brake Bread and Cyclehoop's primary motivation for using e-bikes for work was employee enjoyment of biking. Both stated that they started using e-bikes for work purposes because their employees were avid bicyclists to begin with and so it just made sense to them. Andy Lambert with Cyclehoop stated, "it wasn't so much like a conscious choice. It was just like we have these. We love riding our bikes. Let's try to use them as much as we can." He began using his bike for work because it is more fun and provides exercise and joy during the workday.

The Metro Transit department has a small staff with a mix of confident and timid cyclists. The areas that this department services include a mix of built environment conditions. Jacob Brown provided the example of an audit along the Metro A line down Snelling Avenue in St. Paul as an instance where an employee may likely be uncomfortable utilizing the e-bike, noting that drivers exceed the posted speed limit and drive around 50 miles per hour on some portions, and there is limited space for cyclists. He also noted that workers need to follow traffic laws, so riding on the sidewalk is not an option. For many trips, workers can travel on side streets between stops along the main road to increase their safety or comfort. Nobody on the team has brought to his attention safety concerns yet. Staff are told that they are never required to use the e-bike for any trip that they are not comfortable with and have other options.

A lot of the streets that Brake Bread delivery riders used were residential, so traffic was not a major concern. There have also been improvements in bike infrastructure in St. Paul that improved their delivery capabilities. Further improvements could be made, but infrastructure was fine for their needs. Andy Lambert says that Minneapolis and St. Paul are lucky with the infrastructure that we have, making it easier for a company to incorporate bikes into their work.

Utilizing e-bikes for work purposes was something new and different for Metro Transit, so when the Transit Information team began their pilot, the Safety Department had some initial concerns to address. One step was acquiring safety equipment such as helmets, high visibility vests, built-in bike lights, and reflective materials. Wearable equipment was obtained in multiple sizes based on staff needs. Another action that the team took was partnering with BikeMN to do hands-on training with staff. Most of the staff hadn't ridden

an e-bike before, so in addition to covering basic bike safety, a lot of the training was tailored to gaining familiarity with the unique elements of e-bikes, such as their heavier weight and using the throttles. Two BikeMN trainers came to the Metro Transit facility and did their training with the transit information team of eight. The trainers also provided information materials and handouts. The transit information department plans to require this training before someone is allowed to use the e-bike, so someone on the staff was also trained to train future new users. The University of Minnesota has found operator training to be simple as their e-bike is simple to use. They received some operational instructions from the manufacturer and have also created their own instructional guides.

Biking was part of the culture of Brake Bread from the start, with the majority of workers coming into work by bike as well even if they were not delivering. They did training about e-bikes specifically because they are a bit different from traditional bikes. Andy Lambert of Cyclehoop also had an easy transition to using an e-bike for work because of his experience as a cyclist for so long prior. He and his colleague did not do any training, but would if they were a bigger company that was bringing in e-bike use. He believes that education is important in getting people comfortable with using e-bikes and avoiding injury. Jimmy Gilman with Spin also believes that launching a program with use of e-bikes in mind can be easier than transitioning to a different fleet model. Team members need proper training for successful use and can lack interest in operating a new model when they are entrenched in the process of using vans for operations.

Efficiency and Battery Capacity

The Metro Transit team has found that using an e-bike has had significant benefits for operational efficiency. When someone does an audit of a line, there are often many stops within blocks of each other. Jacob Brown described the oftentimes inefficient process of finding a place to park, retrieving tools from the vehicle, walking to the sign, and walking back to the vehicle over and over along a route with closely spaced signs and sparse parking. Additionally, getting stuck in traffic adds time. Eliminating this inefficiency was a major motivator to start using the e-bike for audits, allowing staff to just roll up, pull over and do their work for a moment, put their materials back into the basket, and proceed. The department has been collecting information on how long line audits are taking to compare to the time it took with a traditional vehicle, and are finding that they can do a far greater number of audits in a single run while using an e-bike than while using a vehicle, and have an easier time doing them. The main benefit of e-bike use for the University of Minnesota so far has been better access to isolated areas because the e-bike is lighter than their

pickup truck, and productivity will be a main determinant of continued or increased e-bike usage in the future.



Image of the Metro Transit bike and a Metro Gold Line Bus (Source: Frederick Melo on Bluesky)

Nate Houge with Brake Bread also found e-bikes to be efficient for delivery service. With further reaching routes, Houge estimated that the time broke even, but generally the few times they used a van for delivery were slower than delivery by bike. This was sometimes because the route had to be different when shortcuts available by bike were no longer available. Bikes lack barriers, without the hassles of parking and getting in and out of a vehicle. With the speed capability of an e-bike, they found themselves with the same people at each stoplight. Andy Lambert agrees that e-bikes have been efficient for work, saying he can easily go 20 miles per hour without breaking a sweat and cover 10 or 20 miles.

Spin finds efficiency to be a primary benefit of e-bike use and the main factor in determining success of an e-bike fleet. When asked what results would make his organization consider expanding e-bike use or recommending e-bike use to others, Jimmy Gilman says that showing a positive impact on team member field tasks completed per hour speaks most to company decision makers from a business cost-savings perspective. Nate Houge with Brake Bread also points out that because he pays workers by the hour, he does have a business interest in delivery rider efficiency.

Another theme that arose during the interviews was the need to plan ahead to maximize the benefits of e-bike use and avoid potential challenges with battery life. The Metro Transit team is trying to determine through their pilot what distances are possible for trips using e-bikes because an e-bike needs to be charged prior to leaving, unlike a standard vehicle that can be refueled mid-trip. They completed an analysis to determine how many bus stops are accessible within ten miles of their facility and found that about 80 percent of bus stops are within this radius. The team currently considers servicing any stop within about a ten mile radius from the facility doable, while anything beyond this radius they do not plan to use the bike for. However, this is not a hard limit. One staff member did some work along the entire Gold Line from St. Paul to Woodbury and back, riding about 36 miles in the process. While the staff member was tired afterwards, he found the use of an e-bike for this trip worthwhile. The e-bike battery lasted the duration of the trip, and this experience provided some evidence that the battery life and assistive peddling enable some extended distance trips. Distance is viewed as a potential limitation, especially as the weather gets nicer and employees will feel more inclined to take longer trips, but there is not yet a clear cutoff point. If an employee does run out of battery and experience difficulties pedaling home, especially with heavy equipment, then they could call the office to have somebody pick them up. There is also consideration of buying an extra battery pack to bring with on extended trips, but this currently doesn't seem urgently needed. Challenges with distance are largely avoidable with proper planning and not insurmountable.

While many promote public e-bike charging infrastructure, Andy Lambert does not consider it a high priority focus. In his experience as an e-bike owner, he hasn't found himself wanting or needing to plug in at destinations because it has become a habit to charge his battery overnight and start his day with a full battery. Businesses can set up their charging where they store their bikes overnight. The Metro Transit team is also forming the habit of plugging in the bike after a ride so that the next person to use it will have a full battery charge. Andy Lambert recommends having a backup battery on hand during rides as well. Public charging is not critical as preparation routines are developed.

Marketability and Alignment with Organizational Values

Brake Bread has experienced a lot of positive reinforcement from members of the cycling community for using bike delivery. Nate Houge states that bikes have a built in community and if you ride a bike, other cyclists will want to talk to you about bikes. He joked that there is other good, or even better, bread out there, but people buy from them because they support the bike element. Their Google reviews affirm this claim, with several reviewers mentioning that they love the bike delivery service and the company's sustainability focus.

Some reviews indicate that the customer base includes cyclists, such as one reviewer writing “tastes even better if you bike there,” while others express general support for the company’s use of bikes.

Nate Houge says that the uniqueness factor goes a long way in gaining support. He found that “people will pay to see you do what you believe in,” paraphrasing a quote from Kim Gordon of Sonic Youth. He believes that the aspirational side is contagious, and doing something difficult resonates with people. Customers want to buy their bread because they see good things happening and want to be a part of something positive. Many people also have positive connotations of bikes. This makes the bike delivery service attractive to both avid cyclists and non-cyclists who support seeing something unique and positive happen.

Brake Bread’s delivery bikes displayed the company name on the trailer, providing the business with recognition that they would not have otherwise received and a major branding advantage, with branding on a bike being more noticeable than branding on the side of a car. One Brake Bread google review indicates the positive impact of this visibility, saying “I love seeing the employees delivering fresh bread around the city by bicycle!” Since biking on behalf of Brake Bread, Nate Houge learned to reinterpret honking from passing vehicles as positive as drivers began to yell out words of support. Andy Lambert also has a stencil on the side of the box that says Cyclehoop that provides advertising. He also says that when he and his colleague show up to business meetings for the Minneapolis secure cycle parking pilot by bike, it conveys to the people that he’s meeting with that they are serious about cycling and are informed. While it is not a primary motivation for using the e-bikes for Metro Transit, Jacob Brown has noticed that community members talk favorably about the department’s use of e-bikes on social media.

Brake Bread is currently at a point of determining how to keep bikes integrated with their business identity. A lot of their core customers are people who were drawn to their bike delivery. There are decorative bike wheels on the wall visible from their “bread bus” where their business’ seating is, and these wheels will be a part of their upcoming patio structure. They hope to support bike rides and bike culture in new ways.

In addition to practical logistical elements, the Metro Transit e-bike pilot was also motivated by a desire to adopt practices that align with the organization’s environmental stewardship values. Metro Transit aims to adopt sustainable practices into their work, previously employing electric and hybrid vehicles. One selling point of starting the pilot was that it could save a lot of CO2 emissions and fuel costs each year. The Transit Information

department plans to try to quantify how much money is being saved in fuel costs and how many tons of CO2 emissions are being saved based on the vehicle miles replaced by e-bike use. Brake Bread was also motivated to use e-bikes for deliveries because of the obvious positive environmental impact of replacing thousands of car trips with trips by bike. The ethos of the business is to do what's best for the environment and their neighbors. This motivates other business decisions like buying from Minnesota farmers. Additionally, Spin mentioned sustainability as a primary motivation for e-bike use and factor in evaluating e-bike use success, and the University of Minnesota's primary motivation for e-bike use is meeting Climate Action Plan goals.



Metro Transit

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We have thousands of bus stop signs scattered across the region, many of which are located on busy city streets that can be reached most efficiently (and sustainably) on a bike.

That's why we recently outfitted our team of sign installers with a customized electric cargo bike they can use to travel from stop-to-stop, replacing decals and performing other maintenance activities. In the past, the team has largely gotten around in a gas-fueled truck. Using these bikes is a simple and effective way to reduce our daily emissions and carbon footprint.

See you out there!

[#MetroTransitMN](#) [#EcoFriendly](#) [#ElectricCargoBike](#)
[#SustainableTransport](#)



2 comments · 9 reposts

LinkedIn post promoting Metro Transit's new use of e-bikes

Operational Logistics and Costs

The e-bike pilot was an opportunity for the Metro Transit team to add to their fleet without the typical delay of the non-revenue vehicle acquisition process. Jacob Brown gave an example of their electric van taking two years to acquire, and the department currently has had three vehicle requests pending for about two years as well. This is one department within a large organization, so there are many other departments putting in requests for vehicles to support their own needs as well that add to the waiting time. For e-bikes, the department is able to order directly from a bike shop instead of joining the waitlist for a vehicle. The supply of vehicles does not match the demand for them, especially because Metro Transit generally uses specialized vehicles. Beyond just demand within the organization, other businesses are also competition for specialized vehicles in low supply. This department's pilot demonstrates to other departments that there are other options available to help meet their needs.

Part of the reason that e-bikes are easier for the Metro Transit team to acquire is cost. E-bikes are significantly more affordable than their typical vehicles, about \$5,000 compared to \$55,000 or more. Because the cost is under \$10,000, the department did not need to go through a competitive procurement process, speeding up the process. The supply issue is a greater factor in the procurement wait, but the cost savings aspect is an added benefit for Metro Transit. Jacob Brown is finding that there's a lot of value in having an e-bike fleet, but the upfront cost is an immediate benefit.

Brake Bread also began using bikes for delivery largely due to the lower start-up costs of using bikes versus purchasing a delivery van and the need to work with what they already had. They found that adding Bafang e-assist to their bikes was also cost effective and easy to maintain. Even with adding e-assist and custom trailers, using a bike was much more affordable than acquiring a delivery van. The low cost of using e-bikes was advantageous for delivering, but the cost of delivering in general was not worthwhile regardless of mode. Likewise, Andy Lambert began using e-bikes for work because he already had one, and has found it to be the option that makes the most financial sense.

While cost savings from cargo e-bike adoption is generally a major benefit, Jimmy Gilman with Spin notes that the price of a higher capacity cargo e-bike that better suits their needs is seen as a challenge. Spin and the University of Minnesota both note interest in personalized modifications to their cargo e-bikes.

Nate Houge has concerns about potential e-bike regulations, such as laws requiring certification or licensing, that could add hurdles to acquisition and hinder e-bike adoption. Andy Lambert also notes the importance of policy in enabling e-bike use, mentioning regulations of what types of electric vehicles are allowed on the street. This was also a major conversation at the inaugural E-Bike Policy Summit, which was hosted by BikeMN and the University of Minnesota's Center for Transportation Studies. At the summit, bike and disability advocates expressed concerns about license and registration requirements for e-bikes and requirements about where e-bikes can be ridden.

Another consideration for cargo e-bike adoption is maintenance needs. The Metro Transit team has a single contact in the garage to go to for in-house maintenance who volunteered to take on this responsibility. They are trying to document and learn from their e-bike maintenance experience during the pilot period in preparation for any future expansion of the e-bike fleet. Brake Bread found their e-assist easy to maintain, relying on online forums for maintenance advice and instruction and the bike maintenance knowledge of employees. For bike maintenance needs that they could not do themselves based on time, knowledge, or tools, they went to local bike mechanics. Brake Bread made some custom modifications to their bikes, trusting that local bike mechanics could help with maintenance. Andy Lambert of Cyclehoop says that making e-bikes easily and inexpensively serviceable is important in promoting broader e-bike adoption for businesses, including the ability to go to any local bike shop to get your e-bike fixed.

Andy Lambert of Cyclehoop explained the importance of bike storage for operating a bike fleet, acknowledging that this comes to mind for him as Cyclehoop addresses this problem. He says that one of the first questions that bike shops and cargo bike brands get from customers are about where to park bikes, especially given the larger size of many cargo bikes. Relatedly, at the E-Bike Policy Summit hosted by BikeMN, the topic of secure e-bike storage came up repeatedly.

The efficiency of e-bike use for delivery and light maintenance tasks is in part due to less need to find parking. Metro Transit and Brake Bread have benefited from the ability to briefly pull over rather than search for a parking spot near their intended stop to complete an audit or delivery.



Cyclehoop bike hangar used in the Minneapolis Cargo Bike Library (Source: MinnPost)

Leveraging the Insights of Early Adopters

Another theme that arose during interviews was the importance of being able to learn from others who have experiences with using e-bikes. When the Transit Information team at Metro Transit began establishing their e-bike pilot and working with the Safety Department to establish protocol, they were able to point to the City of Minneapolis Regulatory Services department as an example of an organization that uses a fleet of e-bikes for similar purposes. The Metro Transit team met with Philip Schwartz to discuss their practices for training and safety and any concerns they had with using their e-bike fleet. They learned that the City did not have any major concerns, and the transit information team adopted some of their basic safety protocol. The team is hoping that they can demonstrate a positive enough experience with the pilot that other departments within Metro Transit will be interested in using an e-bike fleet as well. Jacob Brown says that he would like to see his own department's e-bike fleet expand, and would also like to demonstrate to other teams the potential value of using e-bikes within their own departments.

Nate Houge from Brake Bread remarked that e-bike technology has come a long way since when they started. If they were starting now, they would have relied less on self-made enhancements. They also originally started with traditional bikes, not yet viewing e-bikes as an attainable option. Bike shops now generally sell e-bikes and have certification to work

on them. He also mentioned that St. Paul has grants through the Pollution Control Agency for starting electric vehicle and alternative vehicle fleets. He says that there are more resources available that they could have tapped into.

Regarding evaluating success in use of e-bikes for deliveries, Nate Houge said that he thinks anyone who uses the e-bikes for any amount of time can consider it a success. He wishes that it was still practical for them to do their e-bike deliveries and hopes to be a part of e-bike delivery efforts again. Nate Houge has connected with other bakers across the country doing similar deliveries. The success for Brake Bread is that they did it, learned from it, and are able to share their experiences with others. He feels like it's getting easier, at least in the Twin Cities, to use e-bike fleet and is becoming more visible as an option.

Something that Nate Houge feels could make use of cargo e-bikes easier would be working with multiple businesses to have a shared fleet or a shared delivery route. Cyclehoop's parent company in London is working on a project creating a cargo e-bike sharing mini library for half a dozen small businesses that are close together in Dublin. They installed a secured on-demand bike hanger in a parking lot behind one of the business' buildings with two cargo e-bikes as a shared resource.

Conclusion of Findings

The interviews revealed several main themes about e-bike adoption for cargo movements. Weather was the primary limitation for year-round use of e-bikes, with safety, comfort, and operational concerns mentioned. Generally, e-bikes provide many advantages to businesses and organizations. Employee wellbeing was a major motivation for e-bike adoption, with employees experiencing increases in happiness on the job. Workplaces implement measures to ensure safety and comfort for employees. Marketability was also a benefit for businesses, including increased visibility, uniqueness, and alignment with environmental values. Another benefit of e-bikes is their lower cost in initial purchase and maintenance. Businesses and organizations also found e-bikes to increase operational efficiency, allowing employees to avoid parking and traffic congestion. Businesses and organizations considering use of an e-bike fleet can learn from the insights of these businesses and organizations about the benefits that they have experienced and considerations for maximizing these benefits and avoiding challenges.

Recommendations

Based on the survey and interview results collected for this project, we have identified several significant recommendations that could help to spur further cargo e-bike adoption while continuing to support those who have already incorporated cargo e-bikes into their commercial fleets. These recommendations aim to address existing barriers, enhance infrastructure, and promote awareness of the widespread benefits associated with cargo e-bike use in urban logistics.

Secure Bike Parking: Without adequate parking, the advantages in flexibility associated with cargo e-bikes are severely diminished. In order to provide adequate parking for cargo e-bikes and conventional bicycles alike, we hold that standard designs for bike parking should be established and implemented in zoning and permitting plans in order to incentivize or require the construction of additional bike parking spaces.

Continued Support of Bike Lanes: Extensive and safe bike lane networks are another essential requirement for cargo e-bike fleet operators. While cargo e-bikes are certainly capable of operating on and sharing roadways, the presence of bike lanes significantly enhances operator safety and provides cargo e-bike operators with more flexibility in routing to potentially avoid congestion and delays, saving time and money for e-cargo bike fleet operators. As visible in Appendix I, the heat map of cargo e-bike operators and delivery destinations closely correlate with the presence of bike infrastructure such as the University of Minnesota Transitway or on-street bike lanes such as those on Summit Avenue.

Avoid Overly Burdensome E-Bike License Requirements: We also believe that undue driver's license requirements for cargo e-bike use could unnecessarily limit and disincentivize cargo e-bike use. Currently, Minnesota does not require licensing for e-bike owners and users. However, as the vehicles become more widespread and begin to move into freight-hauling, it is conceivable that this standard may be subject to change. However, we hold that the lack of a license requirement for cargo e-bike operation is a significant advantage associated with this form of transportation. Inordinate license requirements would unnecessarily limit the breadth of operators that a company could hire, raising transportation costs and undermining the advantages of cargo e-bikes for freight-carrying. License certification could also contribute to increased costs for cargo e-bike fleet operators. It is also worth noting that cargo e-bikes do not pose the same risks to pedestrians and other road users as other larger commercial freight-carrying vehicles

where operators are required to obtain a commercial driver's license. Many of the businesses and organizations that we interviewed have independently pursued employee training to better ensure that their employees practice safe riding habits. Most notably, Metro Transit partnered with BikeMN for employee training. Rather than burdensome requirements imposed on businesses, we recommend bolstering training partnerships such as this.

Expand Public Sector Use and Demonstrations: In order to spur further cargo e-bike adoption, we also recommend that cargo e-bikes be adopted by public agencies and institutions. In doing so, these agencies not only contribute to the credibility and viability of this new transportation technology but also benefit themselves by embracing an efficient, sustainable solution for their own urban logistics needs. By adopting cargo e-bikes, agencies can demonstrate the practical advantages of the technology, increase public awareness, and build trust in its capabilities. Since our survey and interviews revealed that perception of cargo e-bike capabilities has been a significant barrier to more widespread adoption and implementation, expanded public sector use and demonstration have the potential to lend agency credibility to this new form of transportation technology.

Expanded Cargo Capacity: As has been previously noted, public perception of cargo e-bike capabilities often do not match the actual potential of the technology. That being said, there do exist freight-carrying needs that cargo e-bikes are ill-suited to address, especially given the typical cargo-carrying capacities of a large segment of the cargo e-bike market. The Civilized Cycles Semi-Trike stands apart from other e-cargo bikes due to its significant cargo-carrying capacity. In order to spur wider e-cargo bike adoption, especially for urban logistics, it is essential that vehicles with additional carrying capacity continue to be developed and improved upon. Relatedly, some of our engagement efforts have revealed a desire for a wider array of cargo-carrying arrangements, including but not limited to refrigeration capabilities. A greater variety of cargo-carrying arrangements could help to broaden the appeal of cargo e-bikes while also addressing perceptions as to their viability in urban freight transport.

Enhanced Weatherproofing: In addition to cargo capacity, our survey and interviews revealed that weather conditions and protection are a significant concern in cargo e-bike adoption. Riders exposed to rain, wind, or cold conditions are far less likely to choose a cargo e-bike over the comfort and protection of a car. If potential users feel they will only be able to rely on the new technology during fair weather conditions, they would logically be hesitant to adopt cargo e-bikes for urban freight transport. While the Civilized Cycles

features a protective covering that helps to protect the rider from inclement weather, future improvements in cargo e-bike technology may include heaters and other weatherproofing such as windshield wipers or fully enclosed cabins.

Project Limitations

Our project was necessarily limited by several factors: scope and timeframe, geographic area, and number of participants. The timeline for project completion was one semester, including survey and interview question development, outreach for business and organization participation, interview completion, analysis, and writing. The initial plan for the project included focus groups that were substituted for interviews due to low participation interest and time constraints. Based on our client partnership with Towerside Innovation District, our outreach focused on areas of the Twin Cities in close proximity to Prospect Park and St. Anthony Park. This enabled us to focus specifically on certain local businesses and their concerns, but further research focused on other areas may be needed to determine generalizability. Additionally, our timeline and geographic focus constrained how many participants we were able to reach. This also limited our ability to reach the perspectives of women with our interviews, especially as this is a male-dominated field.

Areas of Future Study

This study provides an introduction to current cargo movement needs, challenges, and aspirations of businesses and organizations within the Twin Cities, particularly Towerside Innovation District and the Creative Enterprise Zone. This work can be expanded with further data collection efforts to increase the sample size and robustness of current findings. This work can also be replicated to other case study locations. Because two of our interviewees are in the early stages of using cargo e-bike fleet, follow-up research with them could be useful to supplement these early findings. While our report reveals some of the benefits of e-bike use for current users, Metro Transit will complete a report following their e-bike pilot that quantifies some of their benefits. Further research that is focused on quantified results would supplement our findings well.

Areas of future research include consumer interest in patronizing or supporting businesses or organizations that use cargo e-bikes fleet. Another useful future project would be a guide for businesses and organizations interested in adopting a cargo e-bike fleet with best practices and important considerations for making the transition. Additionally, future research could investigate whether there are differences in experiences, considerations, or

benefits for women operating a cargo e-bike fleet that our research missed due to all of our interview respondents being men.

Conclusion

This report provides first findings of the current needs of fleet operators in the Twin Cities and shares insights from early adopters of e-bikes for fleet purposes. We used survey and interview methods to better understand current practices, which built communication networks and provided an introduction of e-bike technology to many businesses in the Twin Cities. There are multiple findings and recommendations of this report that should help guide future research on alternative freight transportation modes and may guide policy or e-bike technology improvements:

- Improve physical infrastructure to promote e-bike adoption.
- Avoid burdensome e-bike regulations, especially licensure and registration requirements.
- Expand e-bike use by public sector organizations and agencies.
- Increase the cargo capacity and improve perceptions of cargo capacity for e-bikes
- Enhance weatherproofing of e-bikes to provide protection against uncomfortable conditions

The Twin Cities is a national leader in bicycle adoption, awareness, and infrastructure. Innovations and support are already being extended to promote e-bikes and cargo e-bikes in the area, with the Minneapolis Cargo Bike Library as a primary example of this grassroots support.⁸ As a leader in bicycling, the Twin Cities is a useful case study to consider changes in freight culture towards bicycling. Examples can inspire other Midwestern or harsher climate geographies to consider year-round, multi-purpose cycling. Building towards a safer, healthier, and more sustainable future requires innovation and trailblazers. Cargo e-bike technology is steadily improving, and early manufacturers and adopters are doing the work to make us rethink urban futures of freight mobility.

⁸ Lindeke, Bill. 2025. "Groups Offer Free Loaners, Training to Demystify E-Bikes Built for More than Two." MinnPost. March 18, 2025. <https://www.minnpost.com/cityscape/2025/03/groups-offer-free-loaners-training-to-demystify-e-bikes-built-for-more-than-two/>.

Glossary

E-bike: A form of bicycle that has electric assist. E-bikes still require some amount of pedaling by the operator

Cargo E-bike: A form of e-bike that is capable of carrying an amount of items. These bikes contain some sort of compartment or area for storage.

Light freight: The carriage of goods or other items in small amounts (under one ton).

First- and Last-Mile: The beginning or end of a journey, characterized by a short trip to or from a larger distribution facility or hub

Fleet Operator: A business, organization, or agency that has some number of vehicles, which are used for business purposes.

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Appendix A: Interview Questions

Questions for businesses or organizations without current e-bike use:

Introduction

Thank you for participating in this interview. We're exploring the potential of electric cargo bikes to improve transportation within Towerside, and your insights as a [business owner or fleet operator] are invaluable. This interview will be recorded for note-taking purposes. Your responses can remain anonymous within the final report if you would prefer.

Current Transportation Practices

1. Can you describe the types of vehicles you currently use for deliveries, transporting goods, or other business needs?
2. What are the biggest challenges you face with your current transportation methods? Think about costs, parking, traffic, delivery times, etc.
3. Can you give us a sense of your typical delivery radius and the size/weight of your typical load? (Ask for examples and clarify units.)
4. What types of businesses and locations do you deliver to most regularly?
5. How important is sustainability to your business operations and your customers?

Exploring Electric Cargo Bike Potential

1. How familiar are you with electric cargo bikes? Have you seen them in use elsewhere? (Show images or short videos of different types of electric cargo bikes.)
2. Thinking about your specific business needs, what are your initial thoughts on the potential of using electric cargo bikes for some of your operations? (Encourage both positive and negative reactions.)
3. What tasks or deliveries do you think *could* be realistically handled by electric cargo bikes? (Brainstorm specific use cases within their businesses.)
4. What are your biggest concerns or hesitations about using electric cargo bikes? Be honest – we want to understand the barriers. (Address each concern with open discussion and seek solutions.)
5. What features or functionalities would be absolutely essential for electric cargo bikes to be a viable option for your business? Think about cargo capacity, range, weather protection, security, etc.
6. Let's talk about cost. What would be a reasonable price point for electric cargo bikes, considering the potential benefits and your budget?

7. What kind of support or infrastructure would be necessary to make electric cargo bikes successful in Towerside? Think about charging stations, maintenance, secure parking, street infrastructure, etc. (Discuss the role of the district in supporting adoption.)

Conclusion

Thank you so much for your valuable insights. This information will be crucial in helping us determine the feasibility of electric cargo bikes in Towerside. Do you have any final questions or comments?

Questions for businesses or organizations with current e-bike use:

Introduction

Thank you for participating in this interview. We're exploring the potential of electric cargo bikes to improve transportation within Towerside, and your insights as a [business owner or fleet operator] are invaluable. This interview will be recorded for note-taking purposes. Your responses can remain anonymous within the final report if you would prefer.

Background

- 1) How long has your organization used e-bikes for your fleet needs? What did you use before switching to e-bikes?
- 2) What are the primary tasks that your organization uses e-bikes for?
- 3) Are there any fleet needs that your organization/department currently does not or cannot use e-bikes for?
 - a) Why?
 - b) What share of fleet needs are fulfilled by e-bikes versus other cargo modes?

Motivations

- 4) What considerations led your organization to start using e-bikes for your cargo movement needs?
 - a) (If the respondent needs prompting): Were there shortcomings with other fleet vehicles, motivations to prioritize certain values, or other considerations?

Transition Logistics

- 5) Can you explain your organization's process in shifting from your previous fleet to your current e-bike fleet? For example, what was the approach to e-bike operator training?
 - a) Were there any challenges?
 - b) What was most important to a successful transition?

Experience

- 6) What are the biggest benefits of using e-bikes for cargo movements so far?
- 7) What are the biggest challenges that you have encountered so far?
 - a) Are there other challenges that you foresee or are concerned about occurring?

Promoting success

- 8) Are there any modifications that could be made to your e-bikes that would help your organization better meet its fleet needs?

Evaluating success

- 9) How will your organization evaluate if the shift to e-bikes has been beneficial? What factors are important in determining success?
 - a) What results would make your organization consider expanding current e-bike use or recommending e-bike use to other entities?

Conclusion

Thank you so much for your valuable insights. This information will be crucial in helping us determine the feasibility of electric cargo bikes in Towerside. Do you have any final questions or comments?

Appendix B: Survey Questions

Consent Statement

The following survey aims to better understand the fleet needs of various businesses and organizations in the Twin Cities area. Responses to this survey will be used and aggregated by a capstone team at the University of Minnesota's Humphrey School of Public Affairs for inclusion in a final report. Results will also be shared with the capstone team's clients (Civilized Cycles and Towerside Innovation District) for their knowledge and future use. Do you consent to the information entered being used by the capstone team, Civilized Cycles, and Towerside Innovation District for research purposes?

- a) Yes
- b) No

About the Business

1 Please state your business' or organization's name:

2) Which of the following industries most closely matches the one in which you are employed? (Select one)

- Real estate or rental and leasing (2)
- Professional, scientific or technical services (4)
- Utilities (5)
- Management of companies or enterprises (6)
- Construction (7)
- Manufacturing (9)
- Educational services (10)
- Wholesale trade (11)
- Health care or social assistance (12)

- Retail trade (13)
- Arts, entertainment or recreation (14)
- Transportation or warehousing (15)
- Accommodation or food services (16)
- Information (17)
- Finance or insurance (19)
- Other services (18)

3) What is your primary business address?

Current Fleet

Intro: The following questions are related to your business' or organization's current usage of fleet vehicles.

- 1) Do you currently operate a fleet of vehicles for deliveries, transportation of goods, or other business purposes? (Any number of vehicles counts as a fleet for this question, even if there is only one)
 - Yes (1)
 - No (2)

If no, skip to next section.

- 2) Approximately how many vehicles are in your current fleet?

3) What types of vehicles are in your current fleet? (Select all that apply)

- Cars (1)
- Vans (2)
- Small Trucks (pickups) (3)
- Large Trucks (box trucks, semi trucks) (4)
- Bicycles (5)
- Other (6) _____

4) Please select your top 3 of the following factors in terms of importance to your business or organization's fleet operation:

- Cost (1)
- Parking (at your place of work) (2)
- Parking (at other sites) (3)
- Cargo capacity (4)
- Fuel costs (5)
- Sustainability (6)
- Security (7)
- Vehicle reliability and repairability (8)
- Labor or Staff capacity (9)

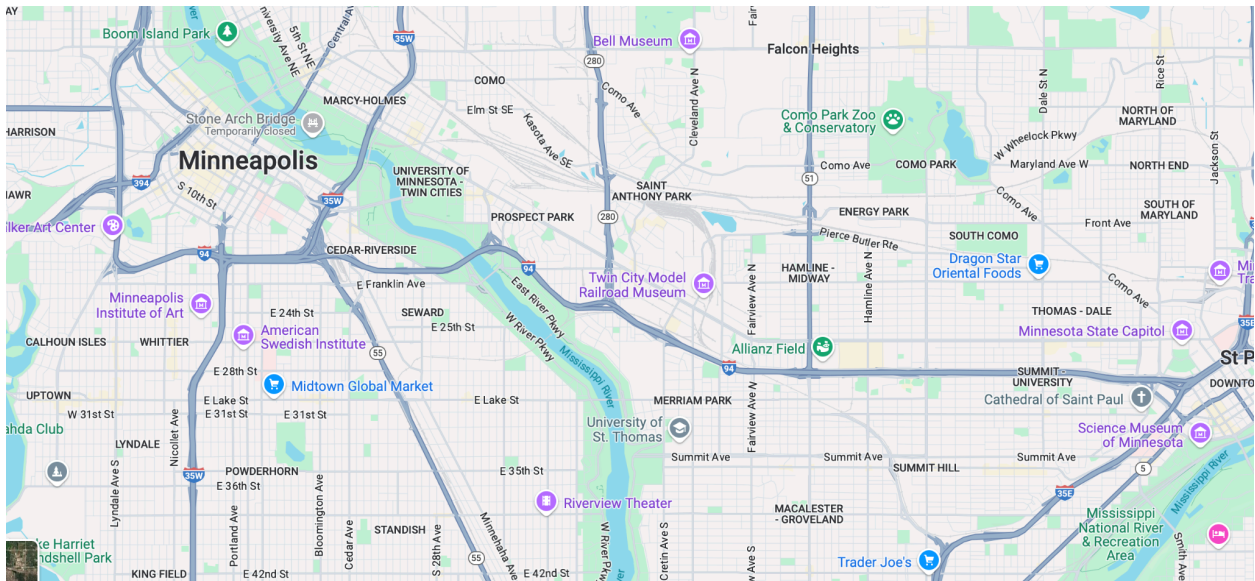
5) Does your business currently operate any electric or sustainable fleet vehicles?

- Yes (if yes, please specify) (1) _____
- No (2)
- I'm not sure (3)

6) How many miles do your fleet typically travel to conduct a delivery?

- 0-2 miles (1)
- 2-5 miles (2)
- 6-8 miles (3)
- 9-12 miles (4)
- 12+ miles (5)

7) Please click on the map to indicate your most common delivery locations (up to 10 allowed).



8) Do you commonly use your fleet in locations outside of the map?

- Yes (if yes, please describe) (1) _____
- No (2)

9) Which of the following are the biggest challenges you face with your current fleet operations? (Select up to 3)

- Parking (at your business) (1)
- Parking (while delivering) (2)
- Traffic congestion (3)
- Fuel costs (4)
- Winter conditions (5)
- Security (6)
- Sustainability (7)
- Labor (8)
- Vehicle reliability or repairs (9)
- Size of cargo load (10)
- Other (11) _____

Cargo Bikes

Intro: The following questions are related to alternative fleet considerations, including e-bikes.

1) Which of these light electric freight vehicles would be most useful to add to your fleet? (Select all that apply)

- Image:Both cargo trikes (1)



- Image:Both light trucks (2)



- Image:Both bikes (3)



- Image:Both pedal cars (4)



- Image:Civilized both (5)



2) Please rate your agreement with each statement below:

| | Strongly Disagree (1) | Somewhat disagree (2) | Neither agree nor disagree (3) | Somewhat agree (4) | Strongly agree (5) |
|---|--------------------------|--------------------------|---|-----------------------|-----------------------|
| I am already familiar with electric cargo bikes (6) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I know of other businesses that use electric cargo bikes for freight delivery or other purposes (7) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

I think electric cargo bikes could replace some of my current fleet for certain tasks (8)



3) Which tasks do you think electric cargo bikes might be suitable for? (Select all that apply)

- Short distance deliveries (1)
- Small package deliveries (2)
- Transporting goods within Towerside Innovation District or within a contained campus (3)
- Employee commuting (4)
- Other (Please specify) (5) _____
- I do not think electric cargo bikes would be suitable for any tasks (Please explain) (6) _____

4) Which of the following are your biggest concerns or hesitations regarding the use of electric cargo bikes? (Select up to 3)

- Cargo capacity (1)
- Range limitations (2)
- Weather conditions (3)
- Security (4)

- Cost (5)
- Parking (6)
- Maintenance (7)
- Safety (8)
- Policy concerns or legality (9)
- Other (Please specify) (10) _____

5) Which features or functionalities would be most essential for electric cargo bikes to be a viable option for your business? (Select up to 3)

- Sufficient cargo space (1)
- Long battery life (2)
- Weather protection (3)
- Secure locking mechanisms (4)
- Easy maneuverability (5)
- Affordability (6)
- Availability of charging infrastructure (7)
- Other (Please specify) (8) _____

Interview Questions

Would you be willing to take part in a short, 30-minute conversation with a member of the University of Minnesota capstone team to further discuss current freight practices and alternatives? (You would be compensated with a coffee or drink of your choice)

- Yes (1)
- Maybe (2)
- No (3)

If no, skip to end of survey.

1) What is your name?

2) What is your email address?

3) What is a good phone number for you?

Appendix C: Survey Flyer

UNIVERSITY OF MINNESOTA
GRADUATE STUDENT TEAM

CIVILIZED CYCLES
TOWERSIDE INNOVATION DISTRICT

ALTERNATIVE FLEET VEHICLE SURVEY

LET US KNOW YOUR CARGO MOVEMENT NEEDS, CHALLENGES,
AND ASPIRATIONS



HUMPHREY SCHOOL
OF PUBLIC AFFAIRS

UNIVERSITY OF MINNESOTA



CIVILIZED
CYCLES

WHY TAKE THIS SURVEY?

- Guide research that could determine how deliveries are made
- Explore fleet that are more affordable and sustainable
- Opportunity for a short Interview with the graduate student team to better understand current and alternative fleet
- Gain access to the final report

**SCAN THE QR CODE TO TAKE THE
SURVEY**



Or Use the Link Below:

https://umn.qualtrics.com/jfe/form/SV_4GfwuyBLoH8h51c

QUESTIONS?

Email Ethan Buss at buss0252@umn.edu

Survey Closes April 1

Appendix D: Survey Email Template

Student Emails

Hello _____,

My name is _____ and I am currently a graduate student at the University of Minnesota. I am reaching out as a part of a graduate capstone team that is researching alternative fleet methods. We are currently conducting a survey of Twin Cities businesses to better understand current fleets, values and priorities when purchasing fleet vehicles, interest in alternative modes of fleet transportation, and barriers to possible adoption of vehicles. As a business/organization that likely has some fleet vehicles, we would greatly appreciate it if you could take the survey linked below. The survey should only take 5-10 minutes to complete, and would be of great value to the University of Minnesota graduate research team as we investigate the current state of Twin Cities fleet vehicles. I have also attached a flyer that provides the same link and a QR code if preferred.

https://umn.qualtrics.com/jfe/form/SV_4GfwuyBLoH8h51c

If you have any questions, please feel free to respond and I will get back to you as soon as possible.

Client Emails

Hello _____,

(Enter self introduction). I am currently a partner in a University of Minnesota graduate student capstone that is researching alternative fleet methods. We are currently conducting a survey of Twin Cities businesses to better understand current fleets, values and priorities when purchasing fleet vehicles, interest in alternative modes of fleet transportation, and barriers to possible adoption of vehicles. As a business/organization that likely has some fleet vehicles, we would greatly appreciate it if you could take the survey linked below. The survey should only take 5-10 minutes to complete, and would be of great value to the University of Minnesota graduate research team as we investigate the current state of Twin Cities fleet vehicles. I have also attached a flyer that provides the same link and a QR code if preferred.

https://umn.qualtrics.com/jfe/form/SV_4GfwuyBLoH8h51c

If you have any questions, please feel free to respond and I will get back to you as soon as Possible.

Appendix E: Focus Group Questions

Electric Cargo Bike Feasibility Focus Group - Towerside Innovation District

Introduction (5 minutes):

"Welcome everyone, and thank you for participating in this focus group. We're exploring the potential of electric cargo bikes to improve transportation within Towerside, and your insights as business owners and operators are invaluable. This discussion will be recorded for note-taking purposes, but all responses will remain anonymous within the final report. We'll start with introductions..." (Have each participant briefly introduce themselves and their business.)

Section 1: Current Transportation Practices (15 minutes):

1. "Can you describe the types of vehicles you currently use for deliveries, transporting goods, or other business needs?" (Open discussion, encourage sharing of specific examples.)
2. "What are the biggest challenges you face with your current transportation methods? Think about costs, parking, traffic, delivery times, etc." (Facilitate brainstorming and note common themes.)
3. "Can you give us a sense of your typical delivery radius and the size/weight of your typical load?" (Ask for examples and clarify units.)
4. What types of businesses and locations do you deliver to most regularly?
5. "How important is sustainability to your business operations and to your customers?" (Gauge level of interest in green solutions.)

Section 2: Exploring Electric Cargo Bike Potential (25 minutes):

1. "How familiar are you with electric cargo bikes? Have you seen them in use elsewhere?" (Show images or short videos of different types of electric cargo bikes.)
2. "Thinking about your specific business needs, what are your initial thoughts on the potential of using electric cargo bikes for some of your operations?" (Encourage both positive and negative reactions.)
3. "What tasks or deliveries do you think *could* be realistically handled by electric cargo bikes within your business?" (Brainstorm specific use cases within their businesses.)
4. "What are your biggest concerns or hesitations about using electric cargo bikes? Be honest – we want to understand the barriers." (Address each concern with open discussion and seek solutions.)
5. "What features or functionalities would be absolutely essential for electric cargo bikes to be a viable option for your business? Think about cargo capacity, range, weather protection, security, etc." (List key features on a whiteboard/flip chart as they are mentioned.)
6. "Let's talk about cost. What would be a reasonable price point for electric cargo bikes, considering the potential benefits and your budget?" (Get a general sense of affordability.)
 - a. What other factors come into play when thinking about cost? ROI, opportunities for subsidy or tax break, insurance and maintenance, other?
7. "What kind of support or infrastructure would be necessary to make electric cargo bikes successful in Towerside? Think about charging stations, maintenance, street infrastructure, secure parking, etc." (Discuss the role of the district in supporting adoption.)

- a) What about bike lanes, snow removal, conflict with car parking, delivery zones, ?
- b) End: Are there any final considerations that we haven't yet discussed?

Section 3: Pilot Program Interest (10 minutes):

1. "Would you be interested in participating in a pilot program to test electric cargo bikes in real-world scenarios within your business?" (Gauge level of interest and ask why or why not.)
2. "What aspects of a pilot program would be most appealing to you?" (Discuss incentives, support, and the duration of the trial.)
3. "What data or information would be most useful to you in evaluating the success of a pilot program?" (Discuss metrics for measuring effectiveness.)

Conclusion (5 minutes):

"Thank you so much for your valuable insights. This information will be crucial in helping us determine the feasibility of electric cargo bikes in Towerside. The University of Minnesota capstone team will be conducting a survey in phase 2 of our project to gather additional data on the needs and interest of businesses in the Twin Cities towards alternative freight options. We would greatly appreciate your participation in that survey to help us gather more large-scale data on business needs. We'll keep you updated on our progress and any potential pilot programs. Do you have any final questions or comments? Please fill out the comment card as you leave to provide feedback for the team."

Notes for Facilitation:

- **Keep the conversation flowing:** Use open-ended questions and encourage participants to share their experiences and opinions.
- **Manage time effectively:** Stick to the allocated time for each section to ensure all topics are covered.
- **Encourage participation from everyone:** Make sure everyone has a chance to speak and avoid letting one or two individuals dominate the conversation.
- **Listen actively and take detailed notes:** Capture key themes, concerns, and suggestions.
- **Be neutral and objective:** Avoid expressing your own opinions on electric cargo bikes.
- **Create a comfortable and welcoming environment:** Make participants feel at ease to share their thoughts openly.
- **Consider visual aids:** Use images, videos, or maps to illustrate key points and stimulate discussion.

Appendix F: Focus Group Poster

POWER UP YOUR DELIVERIES

POWER UP YOUR DELIVERIES: SHAPE THE FUTURE OF TRANSPORTATION IN TOWERSIDE & CREATIVE ENTERPRISE ZONE!

We're exploring the potential of electric cargo bikes to revolutionize deliveries and transportation around the Towerside Innovation District and Creative Enterprise Zone, and we need **YOUR** input!

- **Voice your needs:** Share your insights on current fleet challenges and get a first introduction to electric cargo bikes.
- **Shape the future of Towerside & CEZ:** Contribute to a more sustainable and efficient transportation network.
- **Potential benefits:** Discuss how electric cargo bikes could improve logistics and enhance your brand image with other area stakeholders.
- Meal will be provided for your time (from Pizza Luce)



FOCUS GROUP DATES



Wednesday
Feb 19 2025



Monday
Feb 24 2025



Time
5:00 PM - 6:30 PM



Time
11:30 AM - 1:00 PM



3000 University Ave
SE (Towerside)



3000 University Ave
SE (Towerside)

Scan the QR Code Below to Sign Up

<https://www.signupgenius.com/go/10C0D4AA9A72CABFBC16-55069550-towerside>

Appendix G: Focus Group Comment Card

Thank you for attending the **E-Cargo Bike Focus Group!** Please let us know how it went!

Which date did you attend? (please circle one) March 3rd March 5th

How useful was the conversation for you? ☆☆☆☆☆

What was one thing you liked or one thing we could improve?

Did you have any additional comments or questions that you didn't share in the session?

Would you like to receive additional updates from the project team? YES NO

Would you like to participate in the survey portion of the study? YES NO

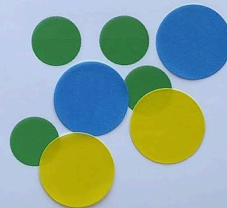
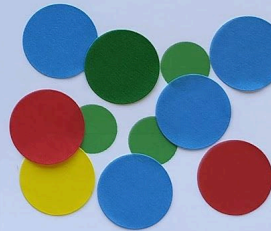
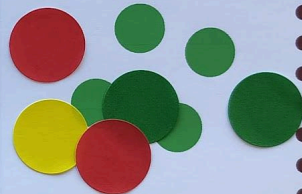
Optional: Your Name _____ Your Email address _____

Please contact Stephen Klimek sklimek@towersidemsp.org with any additional questions.

Appendix H: Earth Week Water Party Engagement

Survey Results

Which of these light e-cargo freight vehicles would be most useful to add to your fleet?
(Select all that apply)




What is your experience with / opinion of e-bikes?

They're fast + fun!

Not a lot of exposure

Good for increasing accessibility by location proximity, but cost prohibitive for who can have access.

Good for increasing accessibility to recreation for a diverse range of people. Weary of lots of them on paths and parkways.

It's easy to use 

Makes it easier for my friends to bike with me!

Makes biking more accessible... could turn many places into 15-minute cities.

How else might businesses use e-bikes for their work?

- REPLACE VEHICLES ON CAMPS SETTING FOR OUTDOOR WORK
- USE FOR INTERNAL LOGISTICS SUPPORT VERSUS PALLET JACKS, PUSH CARTS
- EXERCISE!
- Provide last-mile deliveries in areas with limited parking

• facilitate low/no-cost commute option for employees

• Food recovery across the twin cities

• mail delivery

• delivery for shorter distances

• Moving materials for community engagement / tabling events!

↳ Engagement / outreach + advertising ☺

• Instead of school buses

- Delivery is easier b/c parking/standing is easier + less disruptive to other traffic.



Lose my e-bike for commute to work.
A normal bike would lighten the commute too much.
Wish more people were e-biking their daily!

What is your experience with / opinion of e-bikes?

No experience. ~~Positive~~ Opinion: Should be regulated a bit more - No motorized vehicles - incl. ebikes & scooters on bike lanes & pedestrian pathways.

Zoom
Zoom
they are very fun.

No EXPERIENCE, BUT...
• GREAT OPTION TO GET PEOPLE OUTSIDE AND WHO OTHERWISE MAY NOT
• GOOD ALTERNATE MODE OF TRANSPORT FOR THOSE WITH DISABILITIES
• ECHO COMMENT ABOVE REGARDING REGULATIONS
- BIKE / PED PATHWAYS
- OUTDOOR TRAILS

DON'T HAVE ONE BUT HAVE TRIED ONE AND LIKE IT

I rode one for 30 seconds, but loved how easy it was, there are definitely multiple future uses for more e-bikes!

I'm excited to see e-bike use grow in the Twin Cities!

No experience riding one, but I get tired biking for >10 minutes so I would love to use one!

I've owned one for 5 years and it has replaced a car. It's very useful for shopping and even carrying a passenger. I would heartily recommend.

* Great for Zero emission transportation alternative!

* Great 4 the planet! ♡

* They look cool!

* They go fast!

* easier to get around the cities!

I purchased an e-bike about 2yrs ago and I really like it. I'm starting to trade some shorter car trips for a bike trip and have used it frequently for commuting to work.

So swag & great!!!

I sure love them!

Ebikes make biking as a commute a lot more tolerable - easier, less sweat, faster, more fun! All the good of biking PLUS less downside!

Now, how do we build & sustain infrastructure!?

• connections to low-income communities!

(low car ownership)

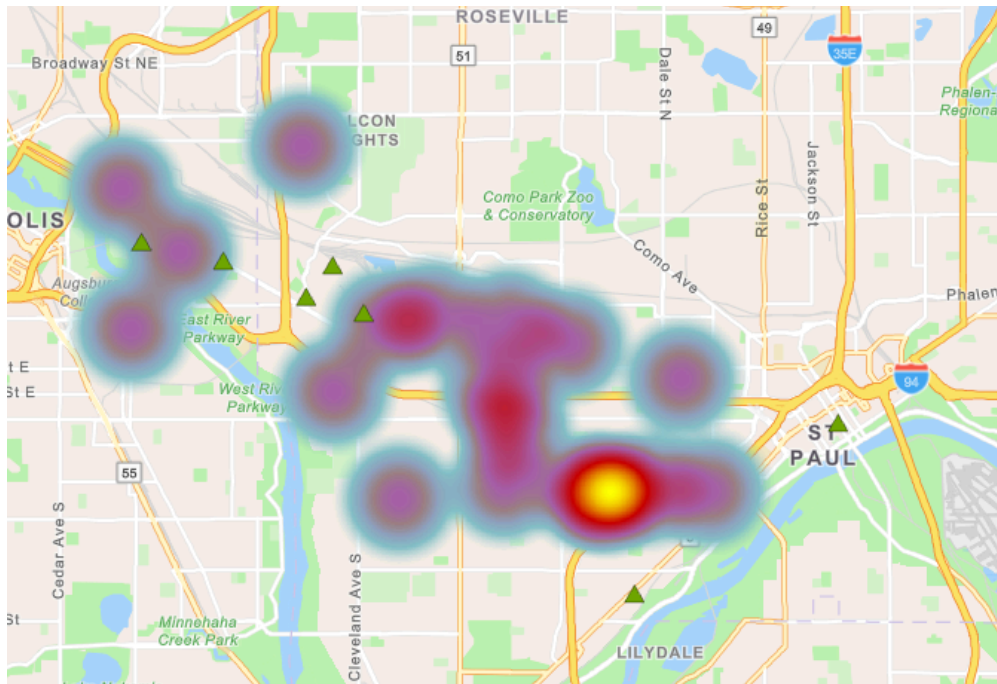
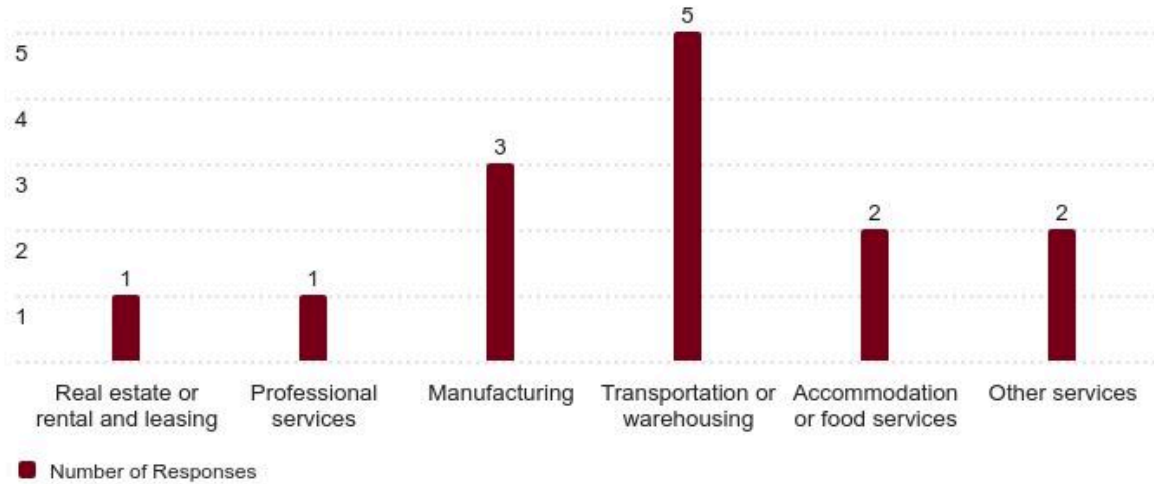
+ newcomers/refugee/immigrant groups

finding sources

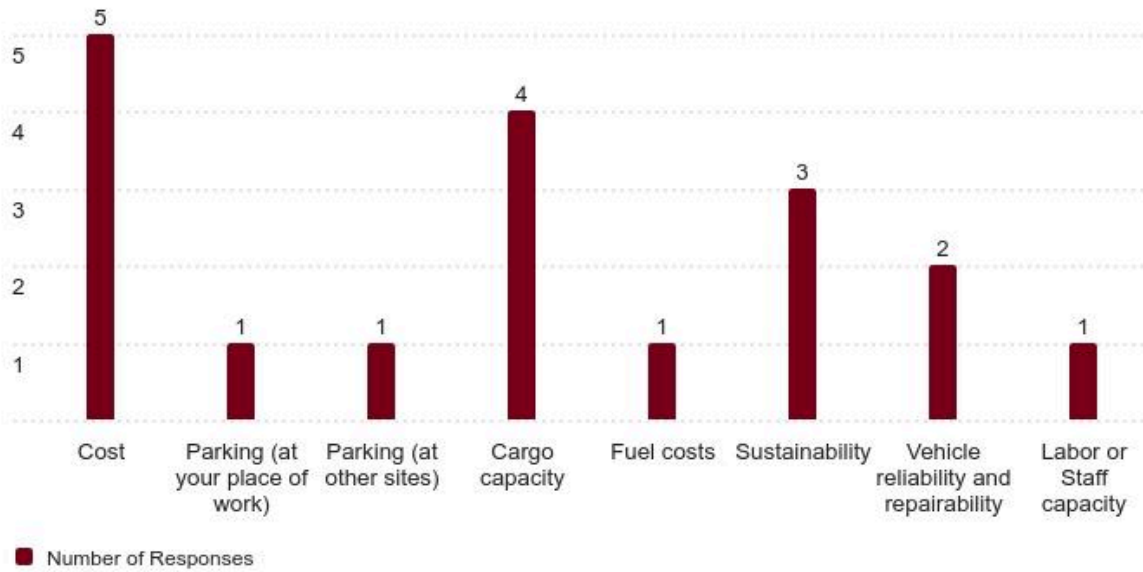
could business go e-bike or contribute?

Appendix I: Graphs and Maps from Survey Findings

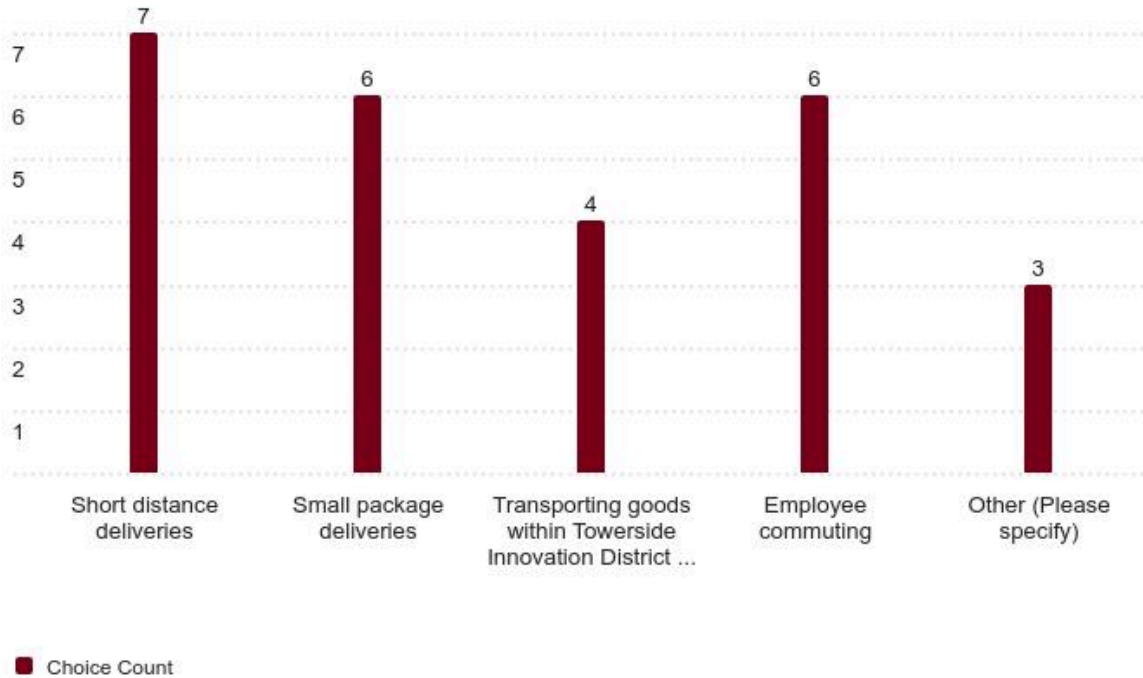
Which of the following industries most closely matches the one in which you are employed?
(Select one)



Please select your top 3 of the following factors in terms of importance to your business or organization's fleet operation:



Which tasks do you think electric cargo bikes might be suitable for? (Select all that apply)



Cargo Bikes 4 - Which features or functionalities would be most essential for electric cargo bikes to be a viable option for your business? (Select up to 3) - Selected Choice

