

THE IMPACT OF CARGO BIKES ON THE TRAVEL PATTERNS OF WOMEN

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ABSTRACT

The Impact of Cargo Bikes on the Travel Patterns of Women

Jana Esther Schwartz

There are a number of issues preventing the rollout of cargo bikes as a transportation mode in the United States. One concern that has been raised is whether cargo bikes can function as a gender equitable transportation solution in the United States, given documented gender gaps in national bike riding statistics and ongoing inequities in childcare in 2-parent heterosexual households. The research is aimed at reviewing the practicality, enjoyment, and outcome of cargo bike use as a gender equitable transportation solution. This research contributes to new knowledge in gender equitable transportation in 2 ways — a) gender-focused analysis of survey data regarding cargo bikes use; b) extended open-ended interviews with mothers with cargo bikes. Qualitative and quantitative data from surveys and interviews explore the influence of cargo bikes on transportation patterns and follow how behavior, attitude, spatial context, and perception varies between riders. Specific attention is given to the use of cargo bikes by women with children, as this demographic represents a minority group in the bicycle community and a group who could benefit most from the capabilities of a cargo bike design. Research shows, mothers spend more hours a day around their children and take part in more child-related activities. Therefore, the comfort and feasibility of the cargo bike for women with children becomes the topic of exploration to determine whether this mode type is a functional substitution for trips usually made by an automobile. Through the collection of a nation-wide survey of cargo bike riders and in-person interviews with mothers in San Luis Obispo, CA who currently use a cargo bike to transport their children and goods, the research assesses the travel patterns of women and the emotional and physical benefits cargo bikes can provide to this specific demographic. Results show that benefits of cargo bike use include bonding opportunities with children and a more enjoyable commute, while barriers to use include ill-performing bicycle infrastructure and time allocation for trips made by the cargo bike, in comparison to the automobile. Mode substitution behavior from the automobile to the cargo bike is geographically and culturally specific, but as results from both parts of the study show, women are receptive to cargo bike use and demonstrate a powerful demographic that has the potential to influence the travel patterns of current and future commuters to shift away from automobile dependency.

Keywords | cargo bike, women, mothers, mode choice, perception of safety, gender differences

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INTRODUCTION

Statement of Problem

What are the causes of minimal cargo bike use in the United States? The United States is an automobile-dominated culture and “attitudinal variables” play a role in mode choice (Baker, 2009). Differences in people’s attitudes and personality traits lead them to attribute varying importance to environmental considerations, safety, comfort, convenience, and flexibility when determining their choice in transport (Johansson, Heldt, Johansson, 2006). In addition to individual differences, variances between gender groups in the rate of bicycle selection for trip purposes and the reasons for these differences will be important for increasing cargo bike ridership in the United States. It is to be investigated how differences in the rate of cargo bike use amongst gender groups in the United States reflect in part the different transportation patterns, needs, and purposes of men and women (Clark, Chatterjee, Melia, 2015). Female bicyclists have different perceptions of safety and different trip purposes than male riders. For women, safety concerns are influenced by both the physical and social environments, and women tend to make more trips for household and family activities/needs than men, many of which require the transport of goods or passengers (e.g. children) (Clark, Chatterjee, Melia, 2015).

Purpose of Study

A cargo bike is a bicycle designed specifically for transporting goods or passengers. This research looks at the influence of cargo bikes on transportation patterns and follows how behavior, attitude, spatial context, and perception varies between individual riders and gender groups. Specific attention is given to the use of cargo bikes by women with children, as this demographic represents a minority group in the bicycling community and a group who could benefit most from the capabilities of a cargo bike platform. This research was divided into a two-part study. First, data was collected from a nation-wide survey to explore trends and behaviors amongst cargo bike users using descriptive statistics. Second, interviews were conducted with female cargo bike riders who bike with children to further inform the function of a cargo bike as a

family vehicle. The research objective is to better understand if the cargo bike is a feasible mode substitution for the automobile, specifically by the use of women, and what factors contribute to this substitution behavior. Information gathered from this research may then inform policies and environmental design decisions to best support cargo bike transportation for all user groups.

Cargo Bike Definition

Cargo bikes (also referred to as freight bicycles, carrier cycles, freight tricycles, box bikes, or cycletrucks) are human powered vehicles designed and constructed specifically for transporting loads (Riggs, 2015). **Figure 1: Examples of cargo bike models and uses** illustrates several, but not all, cargo bike model types and examples of transported loads these bikes are capable of carrying.



Figure 1: Examples of cargo bike models and uses
Source: Flickr, Creative Commons

Cargo bikes have been around for almost as long as traditional bicycles. Originally, shopkeepers would use cargo bikes to make local deliveries (Rivera, Henriksson, 2014). Today, cargo bikes

have popularized amongst private users, especially in European cities, as seen in **Figure 2: “Picking the kids up from school” via Cargo Bike in Amsterdam**. In the Netherlands, main uses for cargo bikes include transportation of children and goods (Rivera, Henriksson, 2014).



Figure 2: “Picking the kids up from school” via Cargo Bike in Amsterdam
Source: Amsterdam Cycle Chic

The cargo bike is a term or object recognized with greater understanding in areas of northern Europe, such as the Netherlands, in comparison to the United States, due to a higher frequency of use. The cargo bike is a widely used vehicle in the Netherlands because of supportive bicycle infrastructure and a cultural norm of bicycle use and dependency. In comparison to the Netherlands, where the infrastructure of cities embraces bicycle transportation and there is a cultural acceptance of bicycle use, the United States did not grow to include the same infrastructure or cultural philosophy towards bicycling, let alone the cargo bike. **Figure 3: United States Bike Infrastructure v. Copenhagen Bike Infrastructure** illustrates differences between the United States and areas of northern Europe, in terms of bicycle accommodations. Many cities around America include bike lanes, as shown on the left of Figure 3, but serve bicycle riders

much differently from European examples, shown on the right. For the purpose of this research on cargo bikes in the United States, a cultural and built environment difference between the United States and European cities is acknowledged, and the United States is treated as a unique entity. With this understanding, recommendations and extended research surrounding cargo bike use will be specific to the growth patterns, cultures, and infrastructure of the United States.



Figure 3: United States Bike Infrastructure v. Copenhagen Bike Infrastructure
Source: Flickr, Creative Commons

In the United States, where the cargo bike is less present and cars overpower the roadway, seeing cargo bikes on a daily basis can work as a reminder of their existence and that they are a transportation option. The social practice of riding a cargo bike largely influences other people to use them (Rivera, Henriksson, 2014). Additionally, there is a consideration for the social influence of particular riders and the degree of influence the environment plays in mode choice decisions. Since women have been perceived as more cautious and with greater responsibility for child and familial needs, women are in a role that can demonstrate whether the cargo bike is a safe, functional, and efficient mode option. Women are also able to model their cargo bike behavior to their children, the next generation of commuters. Cargo bikes allow for women to model biking behavior, even before children are able to bike on their own, and test the short-term and long-term impacts of cargo bikes on travel behavior.

Furthermore, feasibility and function are key considerations when evaluating how the cargo bike compares to the family automobile(s). With the price of a cargo bike between \$1,000-\$4,000+,

these bikes are not cheap—unless they are functioning as the family car. A recent report out of Cambridge interviewed families who utilize cargo bikes to transport their families. One family commented on how they used to spend \$40 a week, or \$160 a month, in gas. When you also consider parking tickets, oil changes, and insurance, the cost of a cargo bike seems more reasonable (Teitell, 2014). Functionality also includes comfort and safety. Statistics about the dangers of biking with children are hard to find. Yet, safety remains a focal concern for woman when it comes to biking, and each person has a different threshold for what feels safe and what does not. Exploring how women perceive safety on a cargo bike will need to be assessed in accordance with trip purposes, the influence of children on trips, environmental impacts, bike design, and demographic considerations to better understand the influence of this mode type on travel behavior.



Figure 4: A (Fun)ctional Cargo Bike trip in Amsterdam
Source: Amsterdam Cycle Chic

Throughout this study, the cargo bike is assessed as an alternative transportation mode with great potential to contribute to sustainable urban development, limit the necessity of automobile use, and exemplify an equitable transportation alternative that is available to both men and women, equally.

Conceptual Basis + Literature Review

Research suggests that there are factors that influence mode choice selection and travel behavior. Impacts of these factors are assumed to affect men and women differently due to physical and psychological differences between genders. Three factors that were discussed most frequently in research as influential factors of modal decisions include: (1) the built environment, (2) attitudes, behavior, and personality traits, and (3) the distribution of male and female roles. The following literature will review the influences of each of these factors and help inform how gender-response differences lead to variances in mode choice selection and travel behavior, ending with existing research that has looked at the cargo bike as a transportation platform. Since very little literature exists on cargo bikes in the United States, most of the following literature research focuses on traditional bicycle transportation and the behaviors influenced by this mode. However, this research identifies variables that influence mode choice and enlightens a new area of research to emerge, which looks specifically at women and the impact of the cargo bike on travel behavior.

The Built Environment and Mode Choice

The built environment is one of the most apparent impacts of mode choice, based on the physical presence of bicycle infrastructure and the observable design of the cityscape. The built environment is a multidimensional concept and comprises urban design, land use, transportation systems, and human activity within the physical environment (Handy, Boarnet, Ewing, Killingsworth, 2002). The impact of these variables influences modal decisions and human behavior. Impacts are tied to the type of environment of the community (rural, suburban, urban) and the local and regional characteristics (Chatman, 2009). When examining interactions between the built environment and travel behavior, various elements of the built environment are more appropriately measured at various scales of geography (neighborhood, city, region) (Handy, Boarnet, Ewing, Killingsworth, 2002) and includes an assessment of the: (1) density and intensity, (2) land use mix, (3) street connectivity, (4) street scale, (5) aesthetic qualities, and (6) regional

structure. More than ever, researchers are dissecting the many ways in which urban form, neighborhood design, and the overall physical make-up of cities and regions shape how people get around (Cervero, 2002). Research can be broken down further to include an assessment of how environmental design and the built environment evoke a different emotional and physical reaction to mode choice for different gender groups.

Research has suggested that the development of the built environment can be disempowering and even be isolating for women. Two ways the built environment may be considered empowering for women is when it (1) encourages an even distribution of domestic labor within the household, and (2) fosters women's participation in place-based social networks (Fagan, Trudeau, 2014). Many women and their families choose neighborhoods based on their expected travel patterns, called the residential self-selection hypothesis (Chatman, 2009). Households choose where to live based on access to work and non-work activity locations, such as parks, shops, doctors' offices, movie theaters, and child care. The characteristics of the built environment near homes and areas of child-related activities (e.g. school) influence auto-dependency and the likelihood of bicycle mode choice. Depending on who in the household makes these trips most often and their level of comfort with using a bike for these trips, the built environment has the capacity to positively influence the use of a biking mode. When investigating the comfort differences between men and women, the interdependence between residential locations, commute behavior characteristics, and attitude towards travel (Schwanen, Mokhtarian, 2005) should be considered when promoting cargo bike behaviors.

The Effects of Attitudes, Behavior, and Personality Traits and Mode Choice

Differences in people's attitudes and personality traits lead them to attribute varying importance to environmental considerations, safety, comfort, convenience, and flexibility when determining their choice in transport (Johansson, Heldt, Johansson, 2006). To increase transport cycling in the United States, addressing gender differences in cycling and the reasons for these differences will

be important. Gender differences in transport cycling include different transportation patterns, needs, and purposes of men and women. For example, women are generally more concerned with issues of safety, comfort, and accessibility, and women are more likely than men to trip chain (combining multiple errands into one trip) as part of their commute because of their greater amount of responsibility for transporting children and to do household shopping (Heesch, Sahlqvist, Garrard, 2012).

A transport bicyclist study between men and women in Queensland, Australia is looked at as an example, despite geographic and cultural differences, because of the attention given to gender differences in bicycling. In Queensland, women were more likely than men to perceive environmental factors, namely traffic and aggression from motorists, as a bicycling constraint. Women were also more likely to report other perceived environmental factors as constraints, such as traffic and transport issues (inhaling car fumes when cycling, inability to put a bicycle on public transit, living too far from destinations), weather and climate conditions (decreased in daylight hours during winter months, rain, wind, hot or humid weather, presence of hills), and individual factors (lack of fitness or confidence in abilities) (Heesch, Sahlqvist, Garrard, 2012).

Few studies have investigated women's perceptions and experiences of cycling and little is known about what motivates and sustains their involvement in bicycling, especially when looking at the cargo bike platform. It has been suggested that commuting behaviors become habitual and that changes to commute mode are most likely to occur at the time of major life events, as well as in association with transport inventions and attitude shifts (Clark, Chatterjee, Melia, 2015).

Following a life event, three factors are believed to play a role in mode choice selection: personal history (prior experience in using different travel modes) intrinsic motivations (saving money, improving health, or protecting the environment), and facilitating conditions (other commuting options availability). Employment changes, residential relocations, and having a child are found to increase the likelihood of commute mode changes occurring, primarily by altering the distance to

work (Clark, Chatterjee, Melia, 2015) and having to depend more on an automobile to assist with changes in distance and time restraints. However, few studies have researched women's perception of bicycle use during major life events.

The Distribution of Male and Female Roles and Mode Choice

Why are there gender differences in rates of bicycling? Impediments to bicycling identified by both men and women include safety in traffic, distances to destinations, network signage, infrastructure, end of trip facilities, and carrying bulky or heavy items. Women will be more heavily impacted by some of these impediments than men because of women's greater responsibility for domestic tasks, like shopping (Bonham, Wilson, 2012). Providing additional empirical insight on how gender influences the decision to use a bicycle will help increase bicycle ridership in communities, particularly amongst women. Behavior related to mode selection and how the use of a bicycle differs between genders is influenced by individual, social, and physical factors. The existing research on cargo bikes looks particularly at the impact of a cargo bike type on individual behavior. In a broad sense, individual factors include attitudes, preferences, and beliefs, as well as confidence in one's ability to engage in the behavior (a concept called "self-efficacy") (Emond, Tang, Handy, 2009). Two factors that appear especially relevant to individualized behavior and explaining gender differences in bicycling include: (1) concern for safety, and (2) household responsibility (Emond, Tang, Handy, 2009).

According to existing research, female bicyclists have different perceptions of safety and different trip purposes than male riders. Women are more risk averse than men and tend to perceive negative consequences of sharing the road. Women tend to make more trips for household and family activities than men, many of which require the transport of goods or passengers, which may feel inconvenient on a bicycle and are potentially exhausting activities. Commuting by car has been found to be associated with being female, having children, having greater access to

household cars, living in a multi-occupancy household, having greater income, and being self-employed (Clark, B., Chatterjee, K., & Melia, S., 2015, p. 3).

Susan Handy, a professor of environmental science at the University of California, Davis, found that “comfort” and “needing a car” were important factors influencing women’s bicycling rates—but not men’s. “Needing a car is likely tied to the household errands women often perform”, Handy says, and could be addressed in part by outreach programs showing that women can ‘jump on a bike the way they jump in a car’ (Baker, 2009). Often times, when kids come along (a major life event), even the most resolute car-free moms tend to get cars because of their time commitment to their kids and family. When a baby is born, suddenly at least one parent (more often the mother) cannot go anywhere without both the child and a large bag full of diapers, toys, and changes of clothes. As the kids get older, someone (more often the mother) then needs to bring them to daycare, school, camp, soccer practice, or birthday parties all over town (Blue, 2012).

Some scholars have begun to connect concepts of difference, exclusion, access, and justice with concrete issues of daily movement (Law, 1999). Daily mobility incorporates a range of issues central to human geography, such as unequally distributed resources and the experience of social interactions in transport-related settings. Gendered norms of domestic responsibility look at the impact of temporal rhythms of childcare, domestic work, and the spatial patterns of segregated land-uses on the restricted mobility of women (Law, 1999). Until child care and household responsibilities are shared equally by women and men and the responsibility to be employed outside of the home is equal amongst genders (Eagly, Steffen, 1984), it is assumed that women will continue to take on more of the responsibility for the needs of their children and family. Thus, shepherding children and their equipment, in addition to the level of societal obstacles women face (Bonham, Wilson, 2012) will have to be considered and accommodated into alternative travel mode options, such as the cargo bike platform.

Literature Summary + Research Platform

What factors contribute to modal decisions and how do these factors for men and women compare? An interest in gender comparison comes as a result of men's bicycling trips surpassing women's by at least 2:1 in the United States (Baker, 2009). This ratio stands in contrast to cycling in European countries, where urban biking is a way of life and draws about as many women as men—sometimes more. In the Netherlands, where 27% of all trips are made by bike, 55% of all riders are women. In Germany, 12% of all trips are on bikes, 49% of which are made by women (Baker, 2009). These statistics are coupled with the understanding that while it appears women in the United States should have bicycle riding data at a more comparable rate to these other developed communities, bicycle infrastructure and cultural norms play a significant role in the decision to use a bicycle over the use of an automobile, and the United States cannot be perfectly compared to regions of Europe because of structural and cultural differences. However, there are factors that contribute to mode choice and behavioral differences between geographic regions and between genders that are yet to be explored and considered. Questions are raised about the leading factors that have contributed to the lack of participation amongst women in the United States and how ridership might be increased. Research regarding these factors includes:

- The built environment
- The effects of attitudes, behavior, and personality traits
- The distribution of male and female roles

Each factor is assessed against mode choice decisions and how an introduced modal category, the cargo bike, may further influence travel pattern behavior for women in the United States.

While a large body of research continues to investigate traditional bicycle transportation, cargo bikes offer the potential to address concerns associated with bicycle commuting and capture trips for those that might otherwise be made by car (Riggs, 2015).

METHODOLOGY

As indicated in the literature, research on and the use of cargo bikes in the United States is limited, as they are not as common. Despite scarcity, conducting research on American behavior with the cargo bike provides relevant information and the opportunity to expose the impacts of this modal option. Since geography, culture, and travel patterns are different from areas where cargo bikes are more heavily used, data can be localized and considered in terms of location-specific norms and behavior.

The research includes two windows of assessment, starting with a broad analysis of cargo bike users and then focusing on specifically female riders. The first step used a survey study that looked at all cargo bike riders from across the nation, which gathered data that established a basis for cargo bike use in the United States. Findings from the survey include statistical patterning that reveals areas for further research. Two such findings include: (1) there is an underrepresented group of female riders of cargo bikes, and (2) children are included in over half of all trips made on the cargo bike. Expanding upon these findings lead to a secondary phase of the study that uses interviews with women who have children and ride a cargo bike to better understand what factors contribute to cargo bike use, or lack of. The methodologies for both parts of the study are described in the following two sections.

Part I : Survey Methodology

The cargo bike platform is an influential transportation mode, from the perspective of sustainable transportation and mode shift potential. However, there is limited research available on this mode choice, especially in the United States. Due to a lack of available data for cargo bike ridership in the United States, a survey was designed to help describe the current setting of the cargo bike in American society. Dr. Riggs, the author of the questions used for the survey, described that the surveys were “issued via email to a database of roughly 2,500 potential and current cargo bike owners. The database took advantage of the mailing lists of two national bike distributors,

Cambria Bicycle Outfitters and Yuba Bicycles, as well as numerous bicycle advocacy groups in the United States. All responses were anonymous and each survey took approximately 10 minutes to complete.” Roughly 300 responses (N=299) were received, and approximately 246 (84.0%) of the respondents owned a cargo bike, providing a margin of error of +/-6% at the 95% confidence interval. Responses to the survey were analyzed against three key survey factors:

- 1) Trip mode before and after (auto, transit, traditional bike, cargo bike, walk, other)
- 2) Trip type (work, school, other)
- 3) Individual characteristics and preferences

The survey was structured in a way to gather information and assess each of these factors both *before* and *after* the purchase of a cargo bike. To do this, respondents were first asked a series of questions about their travel behavior *before* they owned a cargo bike. They were then asked about their behavior *after* owning the cargo bike, using the same sequence of questions. The responses were assessed as a total from all participants, as well as by gender. Gender comparisons provide greater detail about changeover behavior after owning a cargo bike between men and women and factors that contribute to that behavior.

Part II : Interviews with Women Methodology

During the survey assessment, evidence about gender behavior and perception differences arose, which presents a new research area to explore and examine. Data evidence shows that there is an interest in the cargo bike platform by women, yet a small percentage of this demographic has been represented and assessed in detail. A deficit in women ridership shows that there is a need to inquire about rider behavior between genders, separately, to deduce how and if the cargo bike serves each gender differently and how external factors, like child-related responsibilities or having to trip chain between school and work, impacts rider behavior. The national survey received a significant number of responses, a majority of which being from men. It is suggested that more descriptive input from women be gathered in order to identify factors

that contribute most to a woman's decision to ride, or not ride, a cargo bike, as well as to determine if this type of mode has the potential to replace the family automobile for local trips.

To gather a more detailed assessment of a woman's experience on and with the cargo bike, in-person interviews were conducted. The interviews were targeted at, but not restricted to, women with children who currently use a cargo bike as a transportation mode in San Luis Obispo, California. The location was selected due to the time restraints of the research period, as well as the noticeable presence of women with children who use a cargo bike in the community. The geography of San Luis Obispo is recognized as being a bikeable city (recently rated as a Gold Bicycle Friendly Community by the League of American Bicyclists) with accessible amenities, a temperate climate with little weather variation, and a moderately hilly terrain. In addition to geography, the culture of San Luis Obispo is a university town with an above-average proportion of well-educated residents and bicycle commuters, which together, are recognized as influential factors that will be noted in conclusions made as a result of the findings. However, while geography and culture have an impact on an individual's biking experience, each testimonial with individual women focuses heavily on an experiential perspective of using the cargo bike and the influence of environmental conditions and family responsibility, which can be translatable across other communities and women.

Participants for this extended study were found largely through word-of-mouth. Several women who use a cargo bike with their child(ren) were recommended to the research team. Those women agreed to be interviewed and helped refer the research team to other local women who also use a cargo bike. Additionally, an email was sent out through the SLO County Bike Coalition, which helped gather several additional participants. In total, nine (9) women were interviewed, eight (8) of which currently own a cargo bike and ride with children. The women were between the ages of 37-44, have a family size between three and five people, and a majority of the women consider themselves Caucasian. Furthermore, all of the women have either a bachelors or

masters degree and have an average household income of approximately \$140,000. It is also noted that a majority of the women consider themselves experienced bicycle riders and bicycle advocates, with several of the women having a League Cycling Instructor (LCI) certificate on behalf of the League of American Bicyclists. This level of experience is not normative and applicable to most other communities. However, an assumed majority of women and men who currently use the cargo bike in the United States have been involved in the bicycle community for an extensive amount of time and are therefore the population who is most aware of this emerging bicycle platform and most likely to be using this mode type during this early adoption phase. Therefore, finding a sample of women who range from amateur to experienced in their biking ability on the cargo bike is a current challenge of this research.

Finally, interviews lasted between 30-60 minutes and most occurred from the family home, which allowed for mothers to balance home and work responsibilities while interviewing about their use of the cargo bike. The interview questions were structured to be conversational and were broken down into five (5) main categories: 1) introduction (to the bike, rider, and family), 2) transportation and behavior (primary use and reasons for riding), 3) safety and perception (level of comfort and discomfort), 4) demographics, and 5) open-ended comments. Many of the interview questions were based off of the national survey in order to compare findings from each part of the study. Questions that are unique to the interview were included to help gather descriptive reasoning for behavior and perceptions towards cargo bike use. Each mother was encouraged to speak freely about her experiences with using the cargo bike as the researcher typed the interview dialogue. An example of the interview questionnaire and all of the completed interviews from this part of the study can be found in Appendix A.

PART I : SURVEY RESULTS

The results from the survey look at participant responses from *before* and *after* the ownership of a cargo bike to assess how the cargo bike has influenced the travel behaviors for both men and women. As stated in the methodology for this part of the study, three factors represent the focal criteria for observing changes before and after cargo bike ownership: trip mode, trip type, and individual characteristics and preferences. The final part to the survey assessment looks at open-ended responses that help describe the implications of cargo bike use for both men and women. Together, the following sections analyze the response comparison between genders *before* and *after* cargo bike purchase and whether there are changes in primary mode choice and trip purposes, such as the share of child-related trips.

Before a Cargo Bike

Before owning a cargo bike, participants were asked to think about their primary travel mode, the purposes of trips made with their primary travel mode, and if children were involved on these trips. As shown in **Table 1: Primary Travel Mode Prior to Owning a Cargo Bike**, a majority of both men and women commuted by 'car/truck/auto' before ownership of a cargo bike, followed by a 'traditional bicycle' as the second most common primary mode. However, a much greater percentage of men used a 'traditional bicycle' as their primary mode for travel with 39 (36.1%) of the male participants reporting this use. Each of the other mode options, 'bus/transit', 'walking', or 'other' (e.g. bike and subway; motorcycle, etc.), were reported below 6.0% for each gender response group.

Table 1: Primary Travel Mode Prior to Owning a Cargo Bike

Value (By Gender)	Count	Percent
Men		
Car / Truck / Auto	56	51.9%
Bus / Transit	6	5.6%
Traditional Bicycle	39	36.1%
Walking	5	4.6%
Other	2	1.9%
Women		
Car / Truck / Auto	46	70.8%
Bus / Transit	3	4.6%
Traditional Bicycle	12	18.5%
Walking	3	4.6%
Other	1	1.5%

Prior to owning a cargo bike, participants were asked what their primary purpose was for using their primary commute mode. 156 (68.1%) of the participants reported 'work', 25 (10.9%) reported 'school', and 48 (21.0%) reported 'other', such as errands, dropping a child off at school, going to the gym, or taking part in a child activity, as shown in **Figure 5: Trip Type Before Cargo Bike**. This question allowed for participants to respond with an open-ended text answer if they selected 'other'. Many of the 'other', open-text, responses dealt largely with child-related activities and the involvement of children in errands.

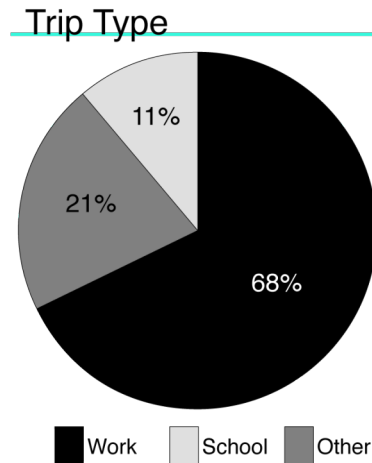


Figure 5: Trip Type Before Cargo Bike

Looking at the gender comparison for the primary mode and the purpose for trips helps assess how men and women use their primary mode for trip purposes differently. **Figure 6: Trip Type + Mode Before Cargo Bike for Men** and **Figure 7: Trip Type + Mode Before Cargo Bike for**

Women illustrate the transportation patterns of men and women, separately. Responses show that men and women are equally dependent on a 'car/truck/auto' as their primary travel mode to work, with 44 (40.7%) men and 24 (36.9%) women reporting 'car/truck/auto' as their primary mode for 'work' purposes. In contrast, across all three trip purposes ('work', 'school', 'other'), 56 (51.9%) of men depend on a 'car/truck/auto', versus 46 (70.8%) of women who rely on this mode type. Additionally, 39 (36.1%) men say that they use a traditional bicycle as their primary mode for all three trip purposes, versus only 12 (18.5%) women who count on a traditional bicycle as a primary travel mode across all three trip purposes. Furthermore, **Figure 7: Trip Type + Mode Before Cargo Bike for Women** shows that 13 (20.0%) women, in comparison to 7 (6.5%) men (in **Figure 6: Trip Type + Mode Before Cargo Bike for Men**), report using their 'car/truck/auto' for 'other' trip purposes, which is assumed to include a trips related to child-related activities.

Primary Trip Mode + Purpose Before Cargo Bike for Men

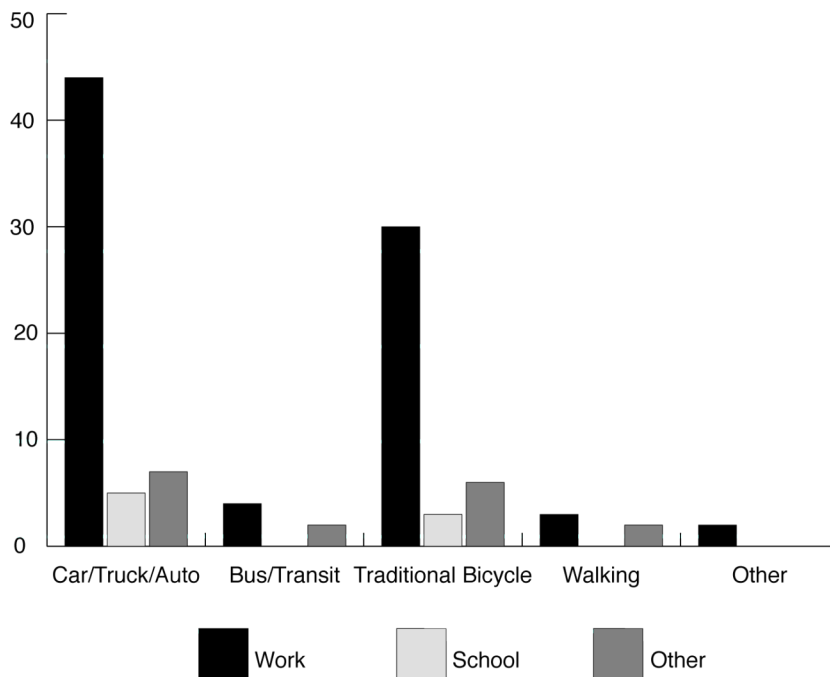


Figure 6: Trip Type + Mode Before Cargo Bike for Men

Primary Trip Mode + Purpose Before Cargo Bike for Women

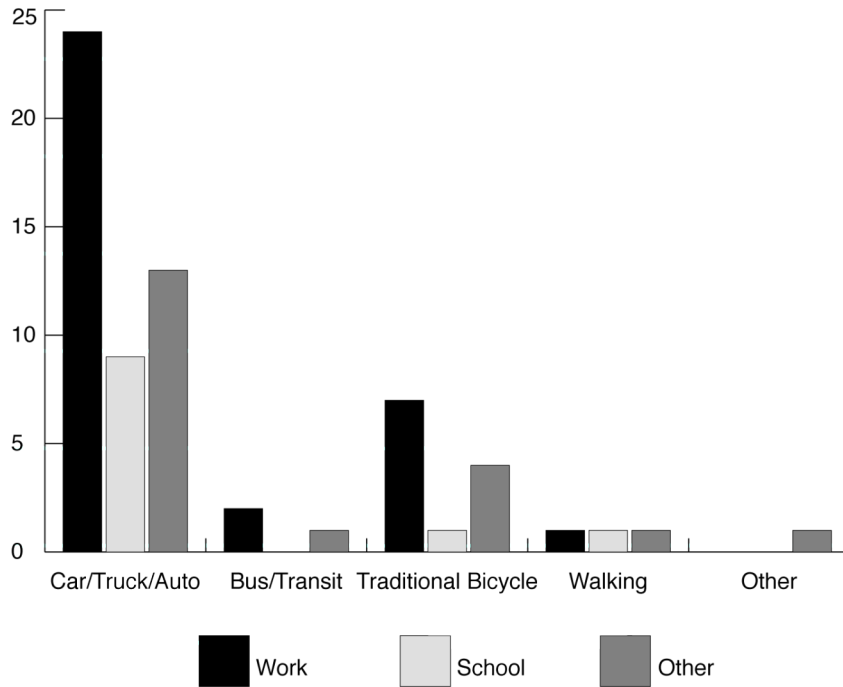


Figure 7: Trip Type + Mode Before Cargo Bike for Women

Since responses indicate an inclusion of children in trips, participants were asked to identify how many children live in his or her house under the age of 6. Seen in **Table 2: Number of Children**, 96 (45.3%) reported '0' children and 116 (54.7%) reported '1+' children.

Table 2: Number of Children

Value	Count	Percent
0	96	45.3%
1	55	25.9%
2	52	24.5%
3	8	3.8%
4	1	0.5%
5+	0	0.0%

With over half of the respondents reporting children as a part of their home, survey participants were then asked to answer if children were included on trips before ownership of a cargo bike. As shown in **Figure 8: Travel With Children Before Cargo Bike**, when asked if the participant dropped a child/children off on a typical trip, 120 (52.9%) said 'yes', 78 (34.4%) said 'no', and 29

(12.8%) reported that this question was 'not applicable' to them. In most cases, this answer meant that the participant did not have children or this was an infrequent activity.

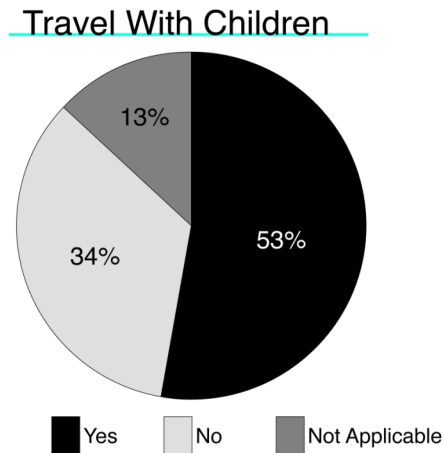


Figure 8: Travel With Children Before Cargo Bike

These responses were then broken up into responses from men and women, separately, which better describes the gender responsibility for child transportation. **Figure 9: Travel With Children Before Cargo Bike for Men** shows how men commute with children, versus that of women, shown in **Figure 10: Travel With Children Before Cargo Bike for Women** (numbers reflect counts from all participants—not only those who reported that they have children). In **Figure 9: Travel With Children Before Cargo Bike for Men**, men have an equal inclusion of children on trips at a rate of 49 (45.4%) men saying 'yes' and 46 (42.6%) saying 'no'. Of the 49 men who said 'yes', 59.2% reported that use of a 'car/truck/auto' to transport children, and 37.2% reported use of a 'traditional bicycle' to transport children. In contrast, women, in **Figure 10: Travel With Children Before Cargo Bike for Women**, did not report a mode for the transportation of children that shared any response rate near that for the car/truck/auto. 36 (76.6%) women reported that they used a 'car/truck/auto' for the transportation of children before the ownership of a cargo bike. Only 5 (10.6%) women reported using a 'traditional bicycle' as a means for transporting children, and the 'traditional bicycle' was the second-highest percentage amongst the women. In total, 47 (72.3%) women include children on trips, leaving only 12 (18.5%) women reporting trips without the inclusion of children.

Kids Included on Trips *Before* Cargo Bike for Men

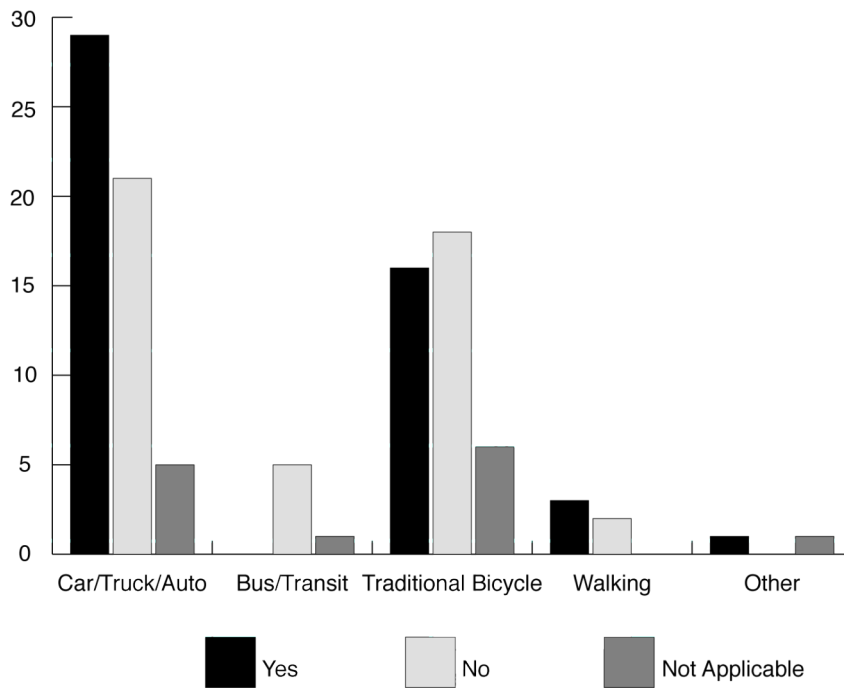


Figure 9: Travel With Children Before Cargo Bike for Men

Kids Included on Trips *Before* Cargo Bike for Women

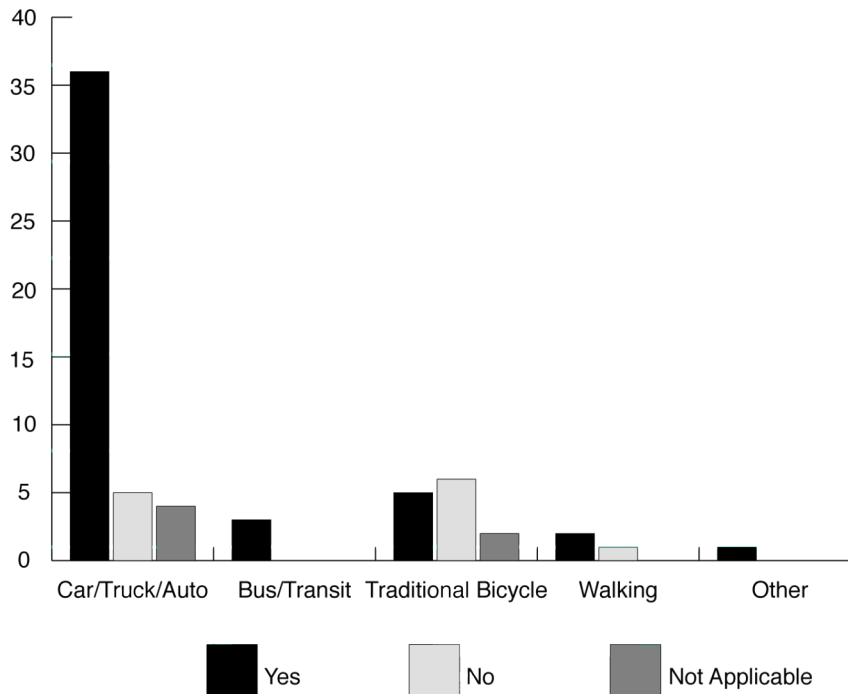


Figure 10: Travel With Children Before Cargo Bike for Women

After a Cargo Bike

In comparison to primary mode choice prior to owning a cargo bike, **Table 3: Primary Travel Mode After Owning a Cargo Bike** shows that 133 (69%) of all respondents reported that they use their cargo bike as their primary mode of travel after purchase. This equates to a 40% reduction in car use. Compared to prior cargo bike ownership, the number of cargo and traditional bike riders rose from 65 (28.0%) to 154 (79.4%). 133 (68.9%) participants reported that this was a change from how they traveled prior to owning a cargo bike. 60 (31.1%) said that their primary transportation patterns did not change, despite the ownership of a cargo bike, suggesting that many had ridden bikes as their primary means of travel prior to owning a cargo bike.

Table 3: Primary Travel Mode After Owning a Cargo Bike

Value	Count	Percent	Percent Change
Car / Truck / Auto	37	19.1%	-40.4%
Bus / Transit	2	1.0%	-4.6%
Traditional Bicycle	21	10.8%	-17.2%
Cargo / Utility Bicycle	133	68.6%	68.6%
Walking	0	0.0%	-3.9%
Other	1	0.5%	-2.5%

When looking at the difference between genders, both men and women saw a decrease in all other modes as a result of the introduction of a cargo bike. Similarly, as shown in **Table 4: Primary Travel Mode After Owning a Cargo Bike**, the cargo bike emerged as the primary travel mode for both gender groups. The women's group saw the greatest changeover with over half of all trips originally made by a 'car/truck/auto' as now being made by a 'cargo/utility bicycle'.

Table 4: Primary Travel Mode After Owning a Cargo Bike

Value (By Gender)	Count	Percent	Percent Change
Men			
Car / Truck / Auto	17	16.0%	-35.9%
Bus / Transit	1	.9%	-4.7%
Traditional Bicycle	17	16.0%	-20.1%
Cargo / Utility Bicycle	70	66.0%	66.0%
Other	1	.9%	-1.0%
Women			
Car / Truck / Auto	13	19.7%	-51.1%
Bus / Transit	0	0.0%	-4.6%
Traditional Bicycle	2	3.0%	15.5%
Cargo / Utility Bicycle	51	77.3%	77.3%
Other	0	0.0%	-1.5%

When asked what the primary purpose of these trips were, **Figure 11: Trip Type After Cargo Bike** shows that 113 (59.8%) said it was for ‘work’, 25 (13.2%) said it was for ‘school’, and 45 (27.0%) described other reasons such as having fun with kids, errands, and appointments.

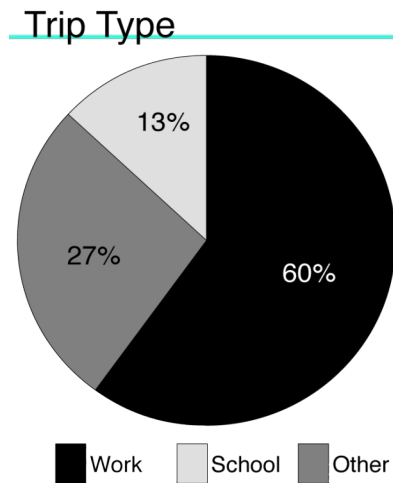


Figure 11: Trip Type After Cargo Bike

These purposes were then broken down further to understand how individual genders have transitioned into using the cargo bike as a mode for various trip purposes, which can be seen in **Figure 12: Trip Type + Mode After Cargo Bike for Men** and **Figure 13: Trip Type + Mode After Cargo Bike for Women**.

Primary Trip Mode + Purpose After Cargo Bike for Men

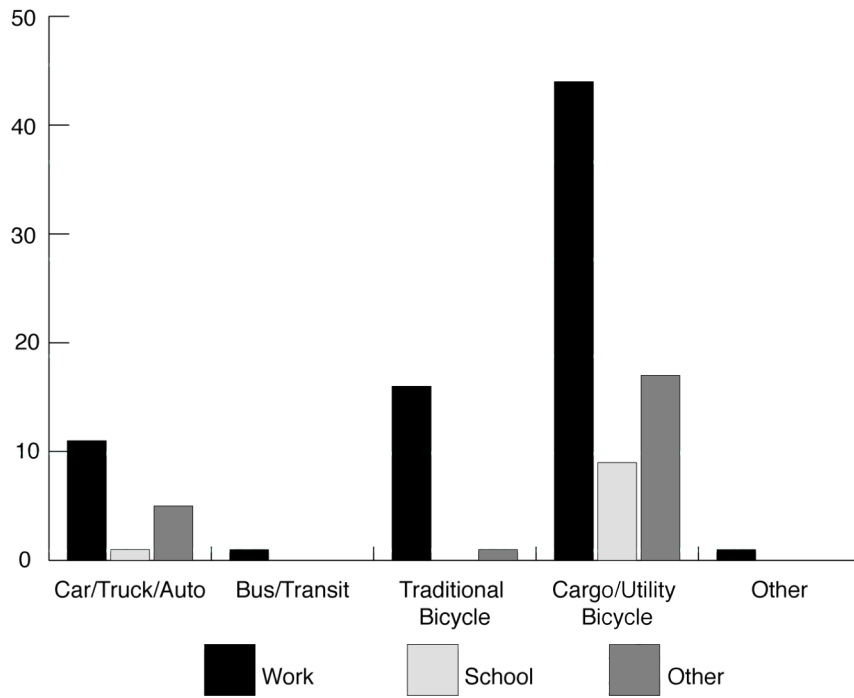


Figure 12: Trip Type + Mode After Cargo Bike for Men

Primary Trip Mode + Purpose After Cargo Bike for Women

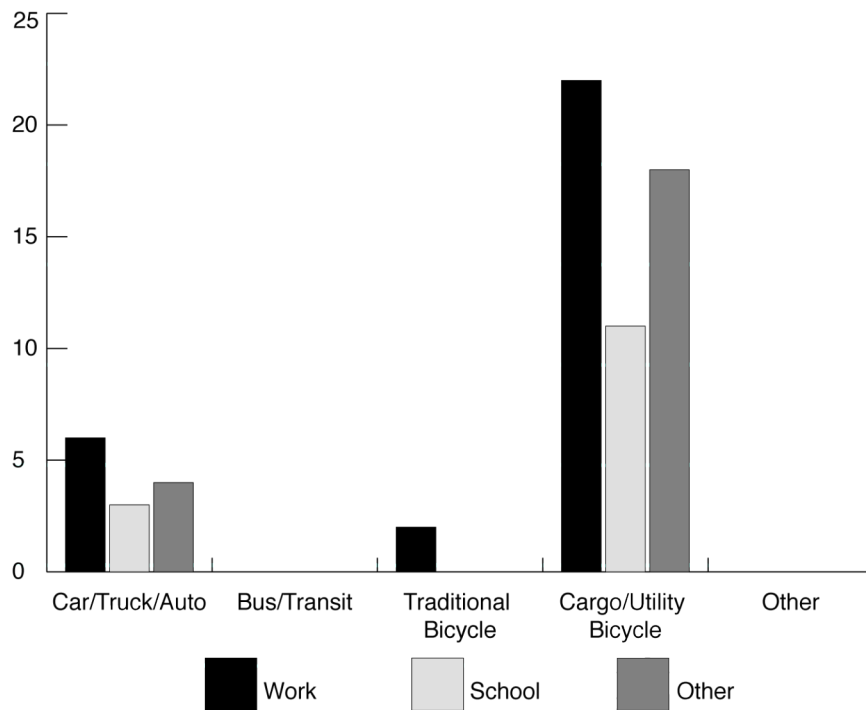


Figure 13: Trip Type + Mode After Cargo Bike for Women

Both **Figure 12: Trip Type + Mode After Cargo Bike for Men** and **Figure 13: Trip Type + Mode After Cargo Bike for Women** illustrate how the cargo bike has impacted the travel patterns of both men and women for all three trip purposes. **Figure 12: Trip Type + Mode After Cargo Bike for Men** and **Figure 13: Trip Type + Mode After Cargo Bike for Women** shows that a majority of all trips made by men continue to be for ‘work’ purposes, with 44 (60.3%) men reporting the cargo bike as how they get to and from work. **Figure 13: Trip Type + Mode After Cargo Bike for Women** shows that women are also using the cargo bike as their primary mode to and from ‘work’, at a rate of 43.1%, leaving 20.0% of these trips made by ‘car/truck/auto’.

Figure 13: Trip Type + Mode After Cargo Bike for Women also illustrates that women are using the cargo bike for ‘school’ and ‘other’ purposes at a higher percentage than men. Women are using the cargo bike for 21.6% of the total trips made for ‘school’ and 35.3% of all ‘other’ trips. This can be viewed in contrast to men who use cargo bikes for 12.9% of ‘school’ trips and 24.3% of ‘other’ trips. When asked if the participant dropped a child/children off on their trip 109 (57.4%) said ‘yes’, 64 (33.7%) said ‘no’, and 17 (8.9%) reported that this questions as ‘not applicable’ to them, shown in **Figure 14: Travel with Children After Cargo Bike**. Compared to prior cargo bike ownership, these numbers remained fairly unchanged. The number of child drop-offs decreased slightly, but the number of ‘not applicable’ and no responses also decreased.

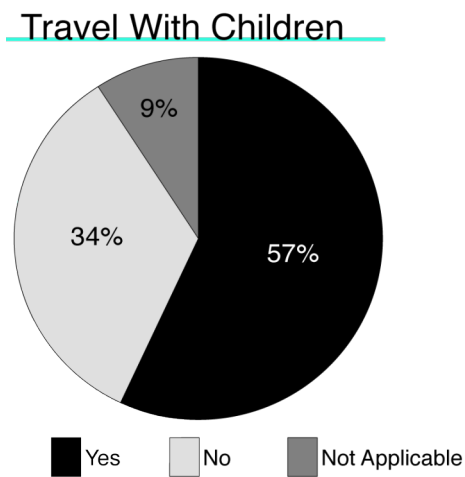


Figure 14: Travel with Children After Cargo Bike

Figure 15: Travel With Children After Cargo Bike for Men and **Figure 16: Travel With Children After Cargo Bike for Women** look at how these numbers translate between genders, both showing a high dependency on the cargo bike when transporting children.

Kids Included on Trips After Cargo Bike for Men

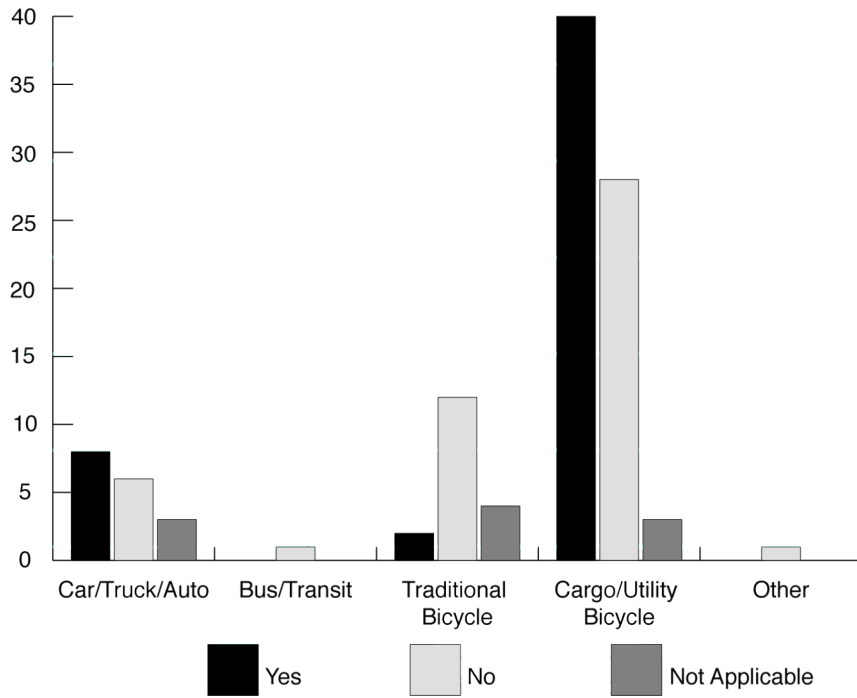


Figure 15: Travel With Children After Cargo Bike for Men

Kids Included on Trips After Cargo Bike for Women

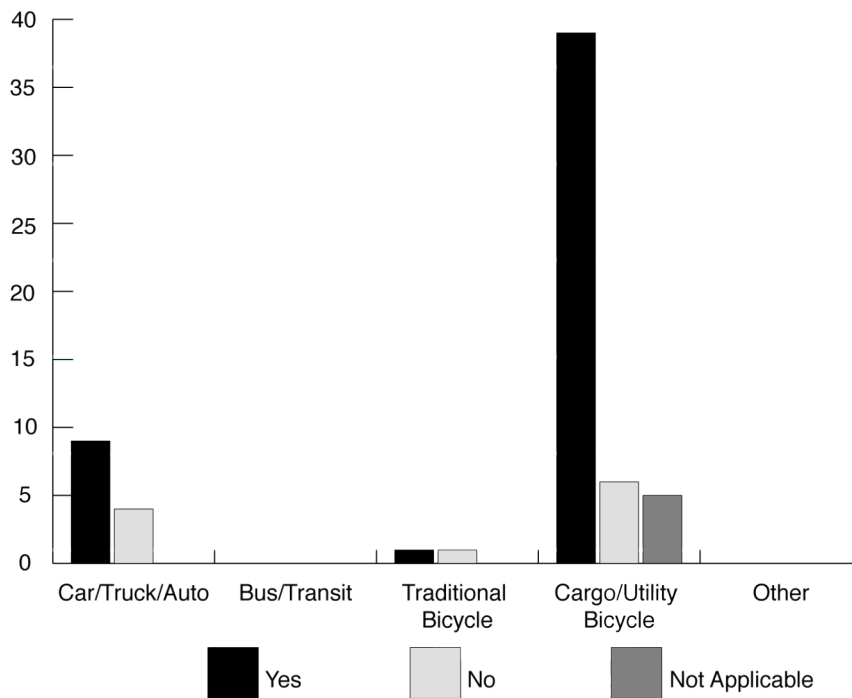


Figure 16: Travel With Children After Cargo Bike for Women

Figure 15: Travel With Children After Cargo Bike for Men and Figure 16: Travel With Children After Cargo Bike for Women show how travel patterns have changed after the introduction of the cargo bike. For both men and women, the cargo bike became the primary vehicle for trips including children, with a majority of women continuing to report that children are included on a majority of all trips made across all mode types. 40 (56.3%) men and 39 (78.0%) women reported using the cargo bike on trips with children (numbers reflect counts from all participants—not only those who reported that they have children). It is assumed that the high percentage of women utilizing the cargo bike for both ‘work’ purposes as well as the transportation of children is a result of women performing more trip-chaining (making many trips and errands out of one long trip) and relying on either a cargo bike or a car/truck/auto to be able to accommodate the diversity of trip purposes and needs.

Additional Questions

Additional questions were asked to participants to expand upon experiential outcomes of cargo bike use and to further refine current understanding of this mode type. Participants were asked to identify reasons they do not use their cargo bike as their primary transportation method.

Responses came back fairly split between 'distance' with 50 (26.6%) responses, 'weather' with 49 (26.1%) responses, and 'other', such as a lack of cargo to haul, traveling with small children, or poor parking conditions and chance of theft at particular destination, with 47 (25.0%) responses. Other factors included 'time' with 32 (17.0%) responses and having 'too much to carry' with 10 (5.3%) responses.

Table 5: Reason for Not Using Cargo Bike

Value	Count	Percent
Distance	50	26.6%
Time	32	17.0%
Weather	49	26.1%
Too much to carry	10	5.3%
Other	47	25.0%

Looking into the differences between genders, using the values shown in **Table 5: Reason for Not Using Cargo Bike**, the gender split for each value is shown below in **Table 6: Reason for Not Using Cargo Bike, By Gender**. Each gender showed an equivalent reasoning for a lack of cargo bike use due to 'distance' and having 'too much to carry'. Despite a larger sample of men who use cargo bikes, a greater percentage of women showed a concern for 'time' and 'weather'. More information is needed to better identify if these factors are correlated to child-related responsibilities or a result of safety and comfort.

Table 6: Reason for Not Using Cargo Bike, By Gender

Value (By Gender)	Count	Percent
Men		
Distance	31	29.2%
Time	14	13.2%
Weather	24	22.6%
Too much to carry	5	4.7%
Other	32	30.2%
Women		
Distance	16	24.2%
Time	13	19.7%
Weather	22	33.3%
Too much to carry	2	3.0%
Other	13	19.7%

When asked if participants had thought about giving up ownership of a 'car/truck/auto' as a result of their cargo bike, 116 (62.0%) said 'yes' and 71 (38.0%) said 'no'. Further research showed that 69 (64.5%) men said 'yes' and 40 (61.5%) women said 'yes', leaving 38 (35.5%) to say 'no' and 25 (38.5%) women to say 'no'. To discover what motivation would cause participants to give up owning and using a car, these responses were self-reported and an open-text response. Some of the most frequently stated responses included better planning and infrastructure, including a city-wide bike lane network, access to public transportation, protection from the elements, living closer to work/activities, and feeling safe and comfortable biking in their city. Over a dozen participants also reported that they have already given up their car, or they have cut down to one vehicle for their household. Many explained that their decisions to give up their car came with the purchase and use of their cargo bike. These factors were not correlated to the gender of the respondents, so little could be said for how each gender responds differently to infrastructure or other restraints, which is cause for additional research on this topic.

Participants were then asked how they have personalized their cargo bike with add-ons to best support their lifestyle and needs. Participants were asked to 'check' any peripheral they considered important to them; a list of the options can be seen in **Table 7: Additional Items / Peripherals Desired**. 91 (47.9%) of the participants said that having a front basket is very

important to them and 85 (44.7%) participants said that having handlebars for their passenger is important. Other add-ons that received over 30 responses included (in the order of importance) a footrest, a child seat, an electric motor, an accessory to tow a bike, hydraulic brakes, and having child passenger enclosure bars. 57 participants also listed 'other', which included side bags/panniers, padded seats, and a bell.

Table 7: Additional Items / Peripherals Desired

Value	Count	Percent
Lights	158	83.2%
Handle bars for passenger	85	44.7%
Child seat	66	34.7%
Child passenger enclosure bars	30	15.8%
Foot rests	69	36.3%
Front basket	91	47.9%
Electric motor	47	24.7%
Accessory to tow a bike	43	22.6%
Hydraulic brakes	32	16.8%
Other	57	30.0%

Three add-ons were assessed between gender groups: 1) lights, 2) child passenger enclosure bars, and 3) a child seat. These features were selected for further review to better understand bike design and accommodations for child-related activities. The gender split for each of these peripherals is demonstrated in **Table 8: Additional Items / Peripherals Desired, By Gender**. The responses illustrate a common importance for 'lights' between genders, but a significant difference in the importance of child-related add-ons, such as the 'child seat' or 'child passenger enclosure bars'. These results support the assumption that women have prioritized peripherals to accommodate child passengers and utilize the cargo bike as a family vehicle. The higher percentage of women choosing the enclosure bars may suggest that women have a higher concern for child safety or they perceive roadway safety as more dangerous than men do.

Table 8: Additional Items / Peripherals Desired, By Gender

Value	Count	Percent
Men		
Lights	92	84.4%
Child seat	32	29.4%
Child passenger enclosure bars	12	11.0%
Women		
Lights	54	80.6%
Child seat	25	37.3%
Child passenger enclosure bars	17	25.4%

In summary, most respondents were white, affluent, and well educated: 62% were men, over 67% had a bachelors or masters degree, most owned 1 or 2 cars, and approximately 50% of respondents made over \$100,000 in household income per year, which reflects an upper to middle class income. While the survey is limited in that it only assessed those who had already self-selected to purchase a cargo bike, it provides characteristics about those who engage in that selection and details about how those characteristics influence travel behavior for those who choose to use the cargo bike as a travel mode (Riggs, Schwartz, 2015). It is noted that participants were asked to self-report any factors or reasons for their change in transportation patterns. Popular responses included the ability to carry multiple children, groceries, and work gear; it is easier to move around town and make local trips; and using the bike is enjoyable and fun, it saves time and money, and travel appears quicker and less stressful.

The results of this study indicate an urban sustainability benefit to cargo bike accommodation, since it appears that many who might not otherwise use bicycles would explore the option of cargo bikes as a substitute for an auto. There are many reasons for this decision but there is an especially strong connection between cargo bike use and trips that involve children – a circumstance that has been a challenge for transportation planners for many years (e.g. How do planners and engineers do about trips to drop kids at school? What do you do about all those bags and all that gear?). This is an important finding since as a newer and more widely adopted bike platform, the cargo bike, could provide an opportunity to create a healthy and sustainable commute that can contribute to less automobile use and more livable and equitable communities.

These changes could also have a dramatic impact for women – who have traditionally been responsible for child-related needs (Riggs, W. W., 2015, p. 8), and are often more reliant on a automobile to accommodate children, activity items, and bits and pieces from errands. Continuing this research will help expand upon how the perspective of a female cargo bike rider varies from that of a male and how the cargo bike and the travel environment can support the comfort and convenience of women.



Figure 17: Examples of Travel Behavior and Trip Purpose
Source: Flickr, Creative Commons

PART II : INTERVIEWS WITH WOMEN RESULTS

The second part of the study focuses specifically on cargo bike ridership by women. This direction of focus came as a result of survey data illustrating how women, when given the option, often choose to ride the cargo bike over driving a car/truck/auto, even when children are included on trips. Interviews with women who use the cargo bike platform help inform the factors that contribute to the mode choice decision-making process, as well as provide a more descriptive understanding of how this demographic of rider interacts with the cargo bike platform on a day-to-day basis. As mentioned in the methodology for this part of the study, several of the women interviewed are atypical samples, in that they have more extensive knowledge of bicycle use and behavior. However, each interview portrays the story of a woman who has chosen to use a cargo bike for personal and familial needs. Therefore, the qualitative data gathered from each of these interviews is valuable for the purpose of understanding how the cargo bike platform serves the needs and transportation purposes for each individual rider, despite ability or experience level.

The following responses have been assessed and analyzed. The process of assessment included looking at how each mother responded to the interview questions and if there is similarity between participant answers. Similarity of answers between women will help identify significant factors of cargo bike use to assess further and note as key findings. The organization of the assessment will look at how each mother responded to the five (5) category areas that are on the interview form in Appendix A.

Introduction Questions

The introductory questions are intended to build a general understanding of the participant (the mom), the family she is a part of, and brief details about the cargo bike. When asked to describe themselves, many spoke about where they went to school, where they work or volunteer, and any community activities they are a part of. Seven (7) out of the nine (9) women went to Cal Poly San Luis Obispo for either their bachelors or masters. Three (3) women have full-time jobs, while six

(6) women work part-time and/or stay at home. Mothers also expressed interests in gardening, participation in the local Bike Coalition, and family activities. Each woman interviewed uses she/her pronouns, is a part of a heterosexual marriage or partnership, and has between one and three children. All mothers who currently use their cargo bike for transporting their children have kids of or bellow age eight (Hannah does not currently ride a cargo bike with her children), shown in **Table 9: Number and Age of Children for Each Mother**.

Table 9: Number and Age of Children for Each Mother

Mom	Number of Kids	Ages
Bonnie	2	4.5 (son); 2.5 (daughter)
Emily	1	1.5 (daughter)
Rita	1	8 (son)
Hannah	2	11 (daughter); 9 (son)
Lisa	1	1.5 (son)
Amy	3	6 (twin sons); 3.5 (son)
Emma	2	6 (daughter); 4 (son)
Hillary	1	8 (son)
Kate	2	3.5 (daughter); 6mo (daughter)

Each of the participants have owned their cargo bike for at least six months, and several women brought up that it took them about that time to feel comfortable riding their bike with their kids around town. Seven (7) women said that they have two cars in their household and two (2) women said that their household has one (1) car. A majority added that use of the car in the local setting was used almost exclusively for trips with many items to carry or events where there is not enough time to trip chain on the cargo bike. More about these challenges is described further in the following sections.

Lastly, the Cargo bike model that each mom rides varies between Yuba, Xtracycle, Larry vs Harry, and the Christiania Dutch-style cargo bike. Each bike model positions passengers either in front or behind the bike operator (mom). **Figure 18: WoGo (Women who Cargo) I Participants of Interview Study** shows each of the mothers who participated in the interviews, as well as the

cargo bike model that they ride. The name of each participant has been changed to preserve her confidentiality and privacy.



Figure 18: WoGo (Women who Cargo) | Participants of Interview Study

Transportation and Behavioral Questions

Questions that were asked of each participant in this section included primary purposes of the cargo bike, vehicle dependency, and basic functions on the cargo bike. The first question asked of each mom was to approximate how many miles she thinks she uses her cargo bike, on days that she uses it.

Table 10: Number and Age of Children for Each Mother

Mom	Number of Miles	Number of Days a Week
Bonnie	2 miles	3-4 days a week
Emily	1 mile	3 days a week
Rita	3-8 miles	2 days a week
Hannah	3 miles	3-4 days a week
Lisa	4 miles	2-4 days a week
Amy	3 miles	5 days a week
Emma	2-4 miles	3 days a week
Hillary	5 miles	2-5 days a week
Kate	5 miles	3-5 days a week

Table 10: Number and Age of Children for Each Mother helps illustrate that all nine women depend on their cargo bike for local trips a majority of the week. It is assumed that most of these trips occur on the weekdays, when school trips and local errands occur most. In the national survey, participants were asked to describe their trips as related to ‘work’, ‘school’, or ‘other’. To gather a better sense of what these trips are for women, each participant of the interview study answered the question, “What are the primary reasons you DO use your cargo bike” with an open-text response. Common responses include, going to school, to get around town for fun and errands, and/or it’s more fun than driving. Other responses include:

*“We take it to school, going downtown for meetings, biking across town to go to farmers market, and we take it on dates. **There are very few places in town that we feel like we can take it.**” – Hillary*

*“**I like the exercise. I also like biking with my kids;** I like the message it gives them. My kids know that cars create gasses that aren’t good for the earth, and biking is a smart thing to do.” – Emma*

*“It’s just more fun. I feel **less stressed**, and I have **cool conversations** with the kids in front of me.” – Amy*

*“**My daughter hates the car seat**; she screams and does that back arching thing. I typically bribe her with blueberries if we have to drive. She doesn’t do that with the cargo bike, **she loves the bike**. She cries if we don’t get to ride it. So, we like using the cargo bike because it’s easier to get her on the bike. I also think **it’s more motivating to ride the bike because my daughter is more interested**; it’s building confidence in bike riding for my daughter and me.” – Emily*

In comparison, when asked, “What are the primary reasons you DO NOT use your cargo bike,” many discussed distance, shortage of time, and/or having to haul too much stuff. More descriptive responses include:

*“For my job, I have to drive 12 miles roundtrip 2-3 times a week. That **distance is longer than reasonable on a bike and it’s just not convenient**. I also have to dress professional, and that can be challenging on a bike.” – Rita*

*“I work about 55 hours a week, so **time is limited**. We don’t have e-assist, so trips on the cargo bike can take a little longer—especially when there are hills. There is also a challenge with the height and weight difference between my husband and I when we share the cargo bike. It took me longer to adjust and feel comfortable riding with our daughter on the bike than it took for my husband to feel comfortable.” – Emily*

*“A lot of it has to do with **convenience**, if it’s cold, it’s raining, or I am in a big hurry.”
– Bonnie*

Each mom was then asked to think about her use of a vehicle and talk about if she (and her family) has considered giving up a car/truck/auto as a result of the cargo bike. And if not, what would it take to get them to do so? **Table 11: What Would it Take to Give Up a Vehicle** illustrates responses and reasoning for this consideration. It is important to note that the two women who currently have only one vehicle for their household are not currently considering giving up ownership of their only automobile. Those who currently have two vehicles for their household may be considering moving to one vehicle as a result of cargo bike ownership.

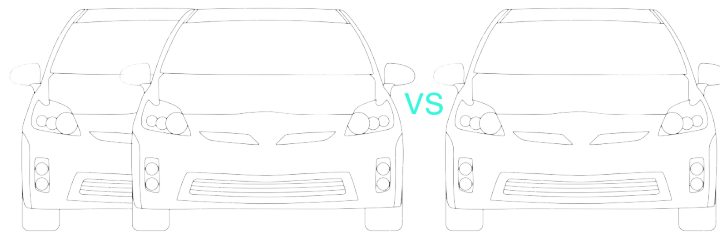


Table 11: What Would it Take to Give Up a Vehicle

No	Reasoning	Yes	Reasoning
Bonnie	To visit family up north; make trips to Costco; no car payments	Rita	Have talked about it, but husband travels for work a lot; no car payments ; both cars are prius' with few maintenance costs
Emily	Haven't had the cargo bike long enough to know how we would function without a car; no car payments ; don't drive that much	Hannah	Sold second car to get the cargo bike
Lisa	Work in Santa Maria (30 miles south); might lose a car if work was in town or grocery stores were closer	Emma	Second car sat in the street and got sold when first child was born; might consider a second vehicle when children get older
Amy	One of our cars is a camper van with nostalgic value	Hillary	One of our cars is old; probably wont replace it when it dies because of the cargo bike
Common responses distance/geographic area no car payment		Kate	Too remote of an area ; if a more urban environment—absolutely give up a car

As **Table 11: What Would it Take to Give Up a Vehicle** shows, over half of the group said 'yes', they have considered giving up a vehicle or have already done so. Limitations to committing to

giving up a vehicle comes down to work location, little financial burden from owning multiple cars, or the inability to depend on the cargo bike for all necessary errands. Further discussion includes a comment from Emma, who represents one of the two participants who are currently a single-vehicle household, where she describes how a second vehicle may be purchased in the future because of the growing trip demands brought on by children getting older and children participating in more city-wide activities. Additionally, Kate's comment about her local geography preventing her from a reduction in vehicle dependency supports the idea that there is an opportunity to improve bicycle infrastructure at not only a local, but also a regional scale in order to promote greater participation in bike-selection over automobile use. These findings show that the dependency on the cargo bike may be restricted by changes to family needs, so the number of automobiles owned may be dependent on these changes, as well as additional factors (e.g. economic allowance or proximity to necessary resources).

The last part of this section asked women to think about the types of 'add-ons' or peripherals they have and like having on their cargo bike, as well as thinking about things that they currently cannot do but they would like to be able to do on their cargo bike. Common responses for the 'add-ons' or peripherals include railing around the child seat, disk breaks, a front basket, a cup holder, panniers (side-bags), lights, and a bell. Several moms talked about the bell as a great way to say 'hi' and to let other bikers or drivers know that a wide load is nearby. Add-ons help personalize a cargo bike to best suit the needs and trip purposes of the rider. These features also allow for the rider (a mom) to feel more comfortable on her cargo bike and the capabilities it has to balance a range of responsibilities that she will depend on her bike to carry and perform. A cargo bike, just like an automobile, may not be perfect in design or function, so women were asked to discuss things that they would like to do on their cargo bike, but they feel they currently cannot do on their cargo bike. Most women covered topics of biking longer distances, balancing heavier loads, feeling safe on all roadways, and going up inclines easier. More descriptive details of conversations include:

*“I don’t have e-assist because **I want to use the cargo bike to work out.** However, with e-assist I could carry lots of groceries and make it up huge hills a lot easier. I also can’t easily transport the cargo bike. **If the cargo bike was a little bit smaller, I could transport it a lot easier.**” – Emily*

*“I would like to use it for more errands, but there are roadways that are really dangerous, especially with a young child, **so I drive instead of cargo bike to certain places because it feels safer.**” – Lisa*

*“**I can’t carry both kids anymore; they’re too heavy.** But, our daughter is old enough that she can ride her own bike. **There are parts of town that have bad roadways** that I won’t go on. But overall, I’m happy to be able to bike around town and feel safe in most places around town.” – Emma*

*“Fly? [Haha] **The bike is not the most stable over loads of 100 pounds.** Other cargo bikes are built to carry bigger loads. I could see how that might come in handy. There is also a big height difference between my husband and myself, so it requires a few tools to make adjustments to fit each of us—but that’s not too hard to do.” – Hillary*

These answers help indicate that the cargo bike is a dynamic and capable vehicle, yet, there are improvements that could be made to provide women, and all cargo bike users, with a more secure and productive experience.

Safety and Perception Questions

This section of questions looks at comfort level, in terms of feeling secure and safe on the cargo bike and in particular environments. Each woman was asked questions that inferred about comfort both on the bike and in certain situations. It is important to note that all nine (9) participants said that they feel comfortable on their style of cargo bike. Reasons provided include sitting up higher, drivers seeming more aware of the cargo bike due to its size, having safety features for child passengers, and being a very steady and sturdy bike—even when the kids are climbing all over it when getting on and off. Several women brought up the frame of the bike as a comfort. Many of the cargo bike models that are ridden by these women have a step-through frame (seeing in **Figure 19: Step Through Bike Frame**), which allows women of a lower stature to be able to stand and steady the bike at a standstill. It is also has a bonus feature of being conducive to skirt-wearing, which several women brought up as a practical and pleasant feature of the bike’s design.



Figure 19: Step Through Bike Frame

Source: Yuba Cargo Bikes

Comparatively, factors that contribute to the women feeling uncomfortable on their bike, includes getting used to the weight of the bike or having multiple kids on the bike with their wiggly behavior. However, most women agreed that they feel in control and safe on their cargo bike. Comfort concern is more heavily tested with environmental conditions and driver behavior.

Women were asked to describe environmental conditions (style of roadway, neighborhood setting, trip purpose, etc.) that make them the most and the least comfortable. Answers to each of these questions can be seen in **Table 12: Comfort vs. Discomfort with Environmental Conditions.**

Table 12: Comfort vs. Discomfort with Environmental Conditions

Mom	Comfortable	Uncomfortable
Bonnie	Neighborhood roads or roads with a bike lane	Major intersections
Emily	Class III bike lanes or trails with dirt because of the traction	Busy streets
Rita	Streets without much traffic or roads with sharrows and/or a bike lane	Congested roads
Hannah	Less traffic and having a bike lane available with signals that react to the bike (difficult to get to a crosswalk button on a large bike)	When cars don't want to share the road
Lisa	Neighborhood roads with no congestion and a wide bike lane	Narrow bike lanes or no bike lanes (hard to squeeze by on such a large bike); fast-moving traffic
Amy	Neighborhood setting	Uncontrolled crossings or roads with major inclines (really tough to get going again)
Emma	Wide bike lane or a buffer between traffic; sharrows that tell drivers to share the road	No bike lane, no sharrows, and when cars don't know how to drive around bikers
Hillary	Enough room for a car and bike to be side-by-side in neighborhood settings; the bike boulevard; bike lanes and sharrows	Fast-moving traffic; when cars get frustrated and honk at the cargo bike (even with kids on the bike); cars driving too close behind the bike
Kate	No cars and wide streets; when people make eye contact; the bike is a novel item, so people generally slow down because of its size	Having to bike in the roadway with traffic; aggressive driver
Coding for answers	presence of bicycle infrastructure calm roadways with minimal traffic neighborhood setting	absence of bicycle infrastructure congested roadways + fast traffic aggressive driver behavior

Elements of comfort largely include calm roadways with minimal traffic, the presence of bicycle infrastructure (e.g. bike lanes, sharrows, and informative signage for automobiles to understand

how to share the road with bicyclists), and biking in a neighborhood setting. Conditions that feel uncomfortable to women include congested roadways with fast-moving traffic, the absence of bicycle infrastructure, and aggressive driver behavior—which several moms shared has occurred on multiple occasions, even with children on-board.

Additional factors were then added to the question of comfort to better understand how women react to specific conditions. Factors include: time of day (i.e. 8am drop off or when there is a low sun), a lack of a bike lane, including children on trips, and environmental conditions (rain, wind, heat, etc.). **Table 13: Do These Factors Impact Your Level of Comfort?** shows how each mom reacted to these factors when considering their cargo bike behavior.

Table 13: Do These Factors Impact Your Level of Comfort?

Mom	Time of Day	No Bike Lane	Including Kids on Trips	Weather
Bonnie	No	No	Yes	Yes
Emily	N/A	Yes	Yes	No
Rita	Yes	Yes	Yes	Yes
Hannah	No	No	Yes	Yes
Lisa	No	Yes	Yes	Yes
Amy	Yes	No	Yes	Yes
Emma	Yes	Yes	Yes	Yes
Hillary	Yes	No	No	No
Kate	No	No	Yes	No

Table 13: Do These Factors Impact Your Level of Comfort? shows which environmental factors have the greatest influence on comfort level. It is noted that comfort runs on an individual spectrum and that each mom may perceive safety and comfort on their cargo bike and riding in their community differently. ‘Including kids on trips’ impacts the comfort level of most women, with the exception of Hillary, who said that if her 8-year-old son was younger or she rode with multiple children she would probably feel less comfortable. ‘Weather’ also influences comfort level, which may change based on geography and individual thresholds for weather and climate changes. A majority of the women said that ‘no bike lane’ did not disrupt comfort levels. However, only Hannah definitively said that she did not mind riding on a street without a bike lane. Other women said that they can ride on a road without a bike lane and that they feel comfortable taking the car

lane, if necessary, but that they prefer riding on a roadway with a bike lane. Discomfort that arose from 'time of day' is largely in relation to rush hour traffic or nighttime riding—which several moms have either not tried with their children or they do not feel comfortable doing at this time. Several moms brought up thinking about comfort not only based on time of day but also time of month. Female bodies are built differently than males, so there are times during the month when your body does not feel physically willing to hop on a bike and rider performance and comfort may be compromised by feeling less patient and distracted.

The final question in this section looks at how comfort on the cargo bike and riding the cargo bike around town compares to driving a car/truck/auto around town. Responses from women varied, so a comments from each woman is included below:

*"I don't like putting my kids in 3-point harnesses (car seat), and I don't think we are safer driving our car. **I think the odds for getting in an accident are higher driving our car.**"*

– Bonnie

*"I don't like to drive; I get nervous. I have gotten in a car accident, so I still think about it. **I feel a lot better on a bike.**"* – Emily

*"It's about the same. **I am less confident when I am riding my cargo bike with my son versus when I am riding by myself.**"* – Rita

*"**I feel more vulnerable on my bike**, there is just less metal around you...but that's always a risk you take." – Hannah*

*"Sometime the bike is easier to get places, but **I don't feel unsafe or safer on either.**"*

– Lisa

“I am more comfortable on my bike. In the car, I’m more distracted and kids are less behaved. The kids can look at more and connect to more when we are biking. There are days that I just don’t feel like biking, but they will say we have to because where we’re going isn’t that far away.” – Amy

“I’m more comfortable in the car, but by a small margin. In comparison to the car, it is harder to talk with the kids because they are behind me and if I turn around to talk, it affects the bike.” – Emma

“I feel stuck in a car, I like being outside, and being out in the open air. My car is gross; there are cracker crumbs in there. You’re probably safer surrounded by 2,000 pounds of steel, but it’s not something that I think about to deter me.” – Hillary

“Now with a family, my perspective is a little different. I would take more risks on a bike before children, and I don’t take those risks with kids. I think if you get hit in a car vs. a bike, you’re going to experience trauma, and that doesn’t go away. The fear of biking or driving isn’t what gets me out the door. The distance I have to travel is what I think about over safety, so a bike and car have different roles, and I depend on a car to take me further.” –Kate

While these comments are largely rooted in individual experiences, answers show a blurred explanation between the comforts of using a cargo bike versus an automobile. Several women commented on the opportunity to be outside and observe more on a cargo bike, but few could describe a difference in an overall sense of safety between the two mode types. Other comments included taking less risk on a bike while children are included on trips, but risk was not measured against automobile trips with children, so it is assumed that more cautionary behavior is comparable between a cargo bike and an automobile. Finally, a comment on distraction levels

from inside an automobile shows how the environment of the transport vehicle may influence safety and behavior. Benefits the cargo bike includes better-behaved child passengers, forgoing technology gadgets to fiddle with, and feeling unbound to a confined space—all of which lead to a safer and more enjoyable travel experience.

DISCUSSION

The purpose of the two-part study was to create a resource that documents how cargo bikes are currently used in the United States and utilizing that information to develop a robust assessment of a particular rider group, women with children. This demographic in bicycle-related research is widely undocumented, similar to the depth of research on the cargo bike platform as a transportation model in the United States. Paired together, a new area of research on equitable and sustainable transportation can be evaluated for purposes of city planning and the promotion of active transportation for all populations. The following discussion will look at the collection of responses from national survey and the in-person interviews with individual women to form a conclusion on whether the cargo bike is a feasible transportation substitute for the automobile.

Areas of focus for this discussion include:

- Key factors that influence cargo bike use for women
- The life-cycle of a cargo bike
- Policy Implementations
- Lessons + Future work

This discussion will look at the feedback provided by the participants and supply suggestions for future work to promote the use of the cargo bike and help inform how to sustain current use and support the growth of new ridership.

Key Factors That Influence Cargo Bike Use For Women

Responses from the national survey and from interviews with individual women help illustrate the influence external factors have on the use of the cargo bike. For women specifically, factors of cargo bike use that surfaced repeatedly during the interview conversations included roadway conditions, weather, the incorporation of children on trips, and level of confidence on a bicycle. Each of these factors impacts a woman's perception of safety, travel behavior, and mode choice.

Many women are deterred by the presence of fast-moving or congested traffic as well as ensuring the safety of their children and themselves while riding a cargo bike. Weather was raised as a concern for cargo bike use, primarily because of convenience and not having the capability to make efficient trips, especially when trips (many including children) are scattered across town. However, the cargo bike does include the capabilities to trip-chain and handle various trips and purposes. Amy brought up:

“Women trip chain more, so they need a trunk. My bike is my trunk. Fortunately, I live in an area where I trust people because I can’t lock my stuff up like I can in a car trunk.”

– Amy

This comment brings up the conversation of location-specific characteristics that support ridership. San Luis Obispo is characterized as a bicycle-friendly community with above average bicycle infrastructure to support bicycle use and mild winters with minimal rainfall. It is also in this region that women, many in the interview subject pool, have acute bicycle knowledge that influences their degree of comfort while using a cargo bike. Recognizing the influence this experiences has on the decision to use a cargo bike, several moms brought up the importance of bicycle education and biking with confidence. Hannah and Emma mentioned:

“You have to first be comfortable riding as an individual before riding your kids. I know a few parents who wanted to ride a cargo bike with their kids, but since they didn’t grow up riding bikes, they didn’t like it.” – Hannah

“I would like to find ways to encourage more moms get out there and bike more, whether with kids or not. I have friends (other moms) who say that they would like to bike with their kids, but they feel nervous about it, and I think it’s because they didn’t grow up biking and they don’t have that comfort level for biking in a city.” – Emma

Gaining a level of comfort as a bike rider on a shared roadway with automobiles is suggested to come from bicycle education—which may take place in the form of classes at a local bike

coalition or from current cargo bike moms who can make their cargo bike available for a 'test ride' to other interested moms/families. Both educational tools would help build up confidence as a rider, with and without children on-board. Both of these steps are important to feeling safe and secure on the cargo bike, especially with child passengers. Since the cargo bike distributes weight differently, takes wider turns, and positions the operator differently than a traditional bicycle, adjusting to these differences may take time but will increase comfort and use. Most of the mothers in the interview study said that they were confident bicycle riders before getting a cargo bike, so the education and comfort qualities for this group of women were pre-established, but may be missing for other mothers and families looking at this mode as an automobile substitution. Enthusiasm for this area of research builds as conversations with women who ride cargo bikes is shared with other moms, and their testimonies show the positive influence this mode has on women, children, families, and communities.

Finally, additional suggestions to support female ridership and bicycle confidence include attention to the aesthetic importance of bike design. There are two positions on this topic: 1) function and 2) marketing. Emily commented:

"We need more women-specific bike options, and make it cool and marketable. Social influence is so important. Also, please don't make them pink; keep bikes urban and bright. Since the cargo bike is pretty bulky and since women are more in-tune to aesthetics, make the bikes look cool and sturdy; women need to be able to picture themselves riding it." – Emily

In terms of bicycle design, while not important to every woman, having a step through frame is more suitable for women because of comfort, stability, and apparel flexibility. Additionally, the design of the cargo bike is just as important as the aesthetic features. Women, like all bicycle riders, want to be perceived as confident road users. Thus, the bicycle should suit the message of confidence and capability, regardless of gender. Suggestions on how to achieve this include

avoiding pink and pastel paint colors and providing bright and striking options that catch attention and interest. The interest these bikes can attract is a marketing strategy for compelling more moms and families to find a place in their travel behavior for a cargo bike.

The Life Cycle Of A Cargo Bike

Since much of the research looks at women involving children on trips while using the cargo bike, the life cycle of the cargo bike emerged through conversations surrounding aging children and trip purpose changes, depending on household needs shifting. Hannah was the only mom in the interview pool that does not currently own a cargo bike and bike with her children on-board. The reasons she does not still own her cargo bike includes her children getting too big for the style of cargo bike that they owned, as well as the accumulation of activities each of her children picked up, which became challenging to manage on the cargo bike.

“Since my kids are older now and we don’t have the cargo bike anymore, I think about cool add-ons that would make it easier to go on multiple trip and carry all of their stuff that they use for activities at an older age.” –Hannah

She also commented on that she has considered purchasing a new cargo bike that she could use for trips to the grocery store, the nursery to pick up soil, or personal errands—trips that are less dependent on the transportation of children but still address household needs while getting exercise during trips.

Similarly, Emma and Hillary are mothers who have children who may soon outgrow the cargo bike. Both moms commented on these changes and the use of their cargo bike from two different perspectives. Emma acknowledges that her two kids are getting older, and as a result, it is challenging to bike with both kids because of more weight on the bike, which feels more unbalanced. Additionally, she is experiencing trip purposes changes as her children participate in more after-school activities that requires trips around town. Emma is currently in a household of

one vehicle, and while she says that she enjoys using the cargo bike for trips to preschool and getting exercise, but that they may purchase a second vehicle to help meet the needs of her family.

In contrast, Hillary spoke about her son (8-years-old), but she did not discuss his age as a barrier, due to the fact that she uses her cargo bike for alternative activities, which utilizes the cargo bike for activities that go beyond child-related activities. In this case, the cargo bike has transitioned into a family vehicle that is not only depended upon for school trips and child-related activities, but also for lifestyle trips, such as attending meetings and going on dates with her husband. **Figure 20: The Life-Cycle of a Cargo Bike** looks at the life cycle of a cargo bike and having to incorporate familial changes into mode choice decisions. Once children get older and trip needs change, there may be a window to assess if auto dependency is necessary, or if the existing/a new cargo bike model can serve new and efficient purposes for personal and family needs. If the cargo bike is viewed as a transportation mode that can serve purposes beyond early-childhood needs, it is more likely to be reviewed as a feasible substitute for the use of an automobile, especially for local trips.

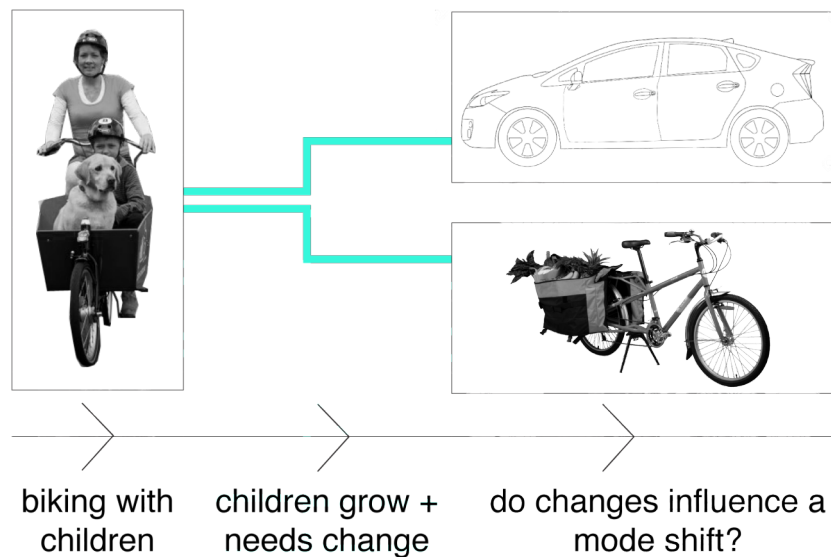


Figure 20: The Life-Cycle of a Cargo Bike

Policy Implementations

Several policy ideas have been raised to help increase cargo bike ridership and confidence amongst women using this bicycle platform. The following ideas are illustrated to show how feedback from women may be incorporated into implementation plans to improve bicycle infrastructure and overall community participation in bicycle transportation. Some of the lessons learned from the open-ended responses include looking at implications of poor bike infrastructure and the psychological road mapping that occurs to best ensure safe travel. Several moms discussed taking more time to think about alternative routes that avoid congested roadways.

Illustrated in **Figure 21: Alternative Routes to Increase Travel Safety and Rider Enjoyment**, a Class IV bike lane, which includes a buffered and designated bikeway and limits the interaction women have with vehicle traffic and creates a more calm and protected biking experience.

Implementation of Class IV bikeway would help ensure greater use of bicycle due to increased comfort and enjoyment brought on by vehicular and bicycle separation. However, Class IV bikeways are not always feasible to implement due to parameters of the built environment or construction costs for implementation. In areas where a Class IV model is not feasible, other strategies include road diets that minimize vehicular road widths and widen bike lanes, painting bike lanes with bright colors to add visibility and interest, and/or incorporating cost-effective bike sharrows in the center of the roadways and peripheral signage where physical bicycle infrastructure changes are not possible. These suggestions are shown in **Figure 22: Roadway Retrofit to Support Safer Biking**.

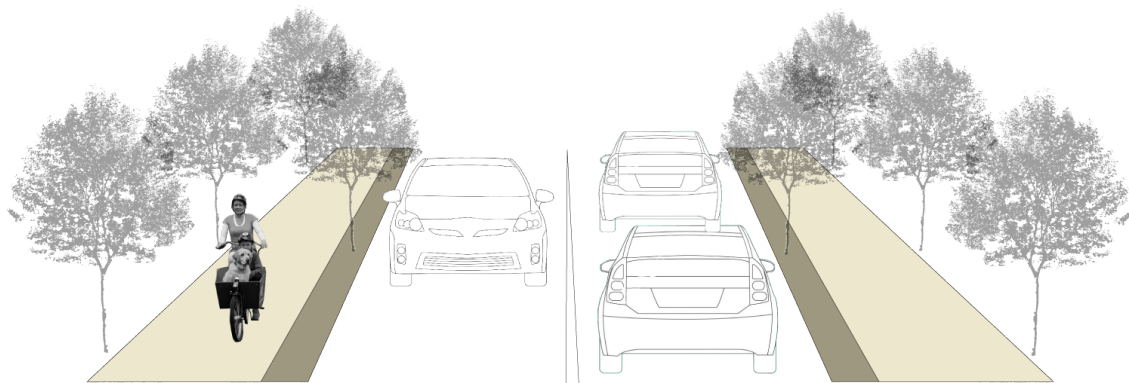


Figure 21: Alternative Routes to Increase Travel Safety and Rider Enjoyment

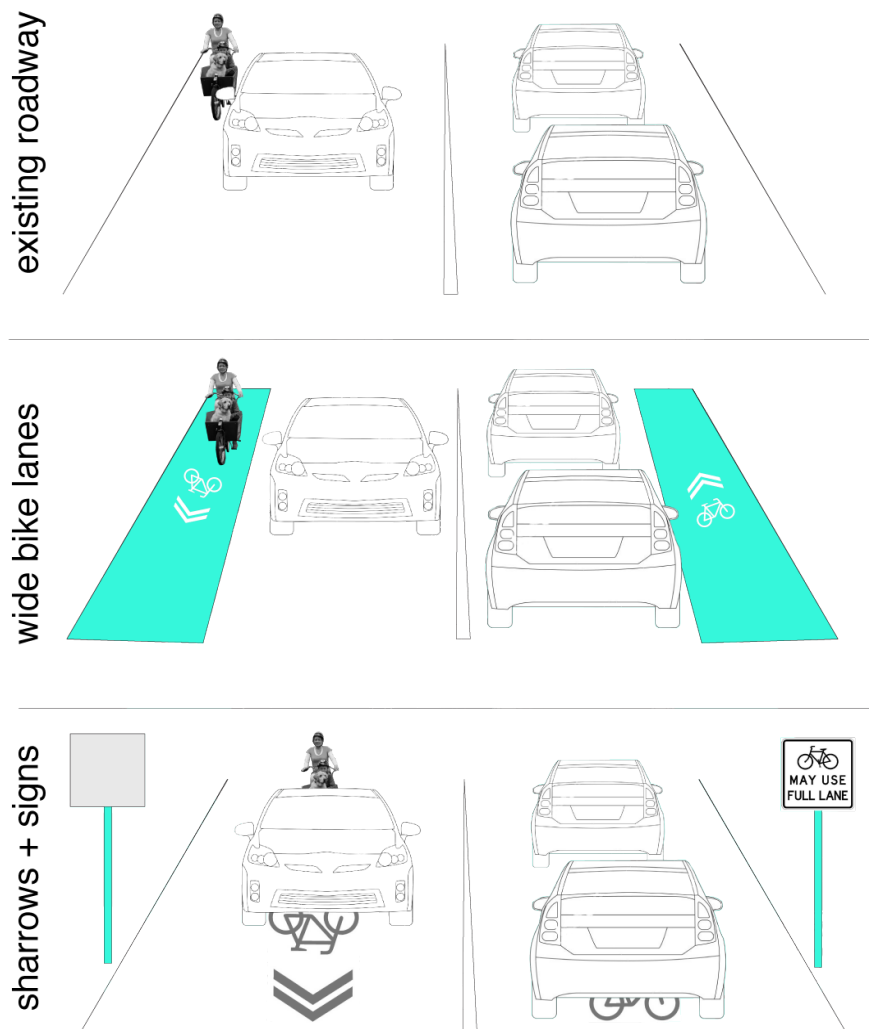


Figure 22: Roadway Retrofit to Support Safer Biking

Future Work + Lessons

Input from the national survey and the in-person interviews with women has helped inform a greater understanding of current cargo bike use in the United States and the challenges this mode platform faces when positioned as an alternative to automobile use. The two key lessons, and causes for continued research, include 1) cultural and infrastructure differences between the Netherlands and the United States, and 2) equitable transportation value cargo bikes provide.

First, the cargo bike is experienced differently in the United States as it is in the Netherlands.

Reasons for these differences include a difference in the cultural acceptance of bicycle

transportation and the city infrastructure that invites and allows for this mode type to be accessible and used as a functional mode of transportation. It is with great understanding that the methods used in the Netherlands cannot be seamlessly adapted in the United States and function the same. The United States is evolving bicycle infrastructure to fit the needs and structure of United States cities and citizen groups. Since the cargo bike is in an introductory stage in the United States, there is ample opportunity to accommodate the cargo bike platform into roadway design and developments. Particularly, addressing larger and more secure parking options and introducing wider bikeways to accommodate a longer, heavier, and wider bike model. Any change made to support the use of a cargo bike will increase use potential and the safety of communities.

The second lesson brings up gender equity in bicycling. This research serves as documentation that shows that women have different experiences with the cargo bike in comparison to men. Key factors that contribute to these differences include familial responsibilities and commitment to household needs. These factors present women with a skewed opportunity to select a mode alternative to the automobile due to carrying capacity needs. However, what data shows is that the cargo bike possesses adequate carrying capacity and can fulfill the needs for various trip purposes. Therefore, the cargo bike has emerged as an option for women to choose and relieve themselves from the hours of time spent in a vehicle. Women express their use of the cargo bike as safe, comfortable, and unique. Enjoyable aspects include interesting conversations with children on-board, feeling de-stressed from being outside, and getting exercise during purposeful trips.

Finally, further research is suggested to look at additional implications and outcomes of cargo bike use. First, comparing the experiences of men on a cargo bike at the same level of detail as the women from the interviews should also reinforce findings in the interviews with women and provide additional feedback on how communities could better serve the growing need and desire to bike. Influences of cargo bike use by men are assumed to include longer workweeks and not

perceiving uses on the cargo bike as an adequate recreational tool. A secondary research area to explore includes modeling and the long-term impacts of cargo bike use as a result of the transportation of children. As children are raised with a cargo bike as a transportation norm, children may grow up and self-select a cargo bike or a traditional bicycle as a primary mode, versus an automobile, which would revolutionize how future generations perceive the bicycle as a standardized transportation vehicle. Finally, the cost benefits of cargo bike use versus an automobile is currently undocumented and would help illustrate the economic and environmental savings of selecting to use a cargo bike over the use of an automobile. There is existing research on traditional bicycles in comparison to the automobile, but traditional bicycles do not provide the same level of function and carrying capacity as the cargo bike. Assessing the financial costs of owning a cargo bike (the cost of the cargo bike, add-ons, and up-keep) and the environmental costs of owning a cargo bike (Greenhouse Gas emissions, fossil fuel dependency, and public health impacts) to the financial and environmental costs of owning an automobile may help motivate more individuals and families to switchover from automobile to cargo bike dependency.

CONCLUSION

The research study highlights a substantial difference in travel behavior between men and women and utilizes the cargo bike model as the means for investigating thresholds of transportation comfort, function, and enjoyment. Since few studies have looked at women's perception experiences while using a cargo bike, there is little to refute assumptions made as a result of this two-part study. It is assumed that a higher rate of ridership will result as communities become more attentive to bicycle infrastructure improvements and as cargo bikes are discussed and recognized at a higher volume. The implementation of these two factors may influence the rate at which mothers invest in the cargo bike idea because of continued hesitation of roadway safety and unfamiliarity with the cargo bike platform. It is suggested that mothers of cargo bikes help advise other mothers about the benefits of this mode, which includes bonding opportunities with your child(ren), productive exercise during errands and other trips, and growing a safer and more equitable cityscape.

Interviews with mothers, in addition to the information gathered from the national survey, suggest that the cargo bike is a practical substitute for a vehicle, but under unique circumstances. These circumstances include living in a city with supportive bicycle infrastructure, mothers having pre-existing knowledge of roadway safety on a bicycle and amongst car traffic, having financial ability to invest in a cargo bike, and time availability to transport children and make errands on a slower mode of transit. Only three (3) of the nine (9) moms interviewed work full-time, currently. Without the commitment of a work trip, mothers have one less stop attached to their trip chain, which was discussed to include school drop-off/pick-up, household errands, or other personal trips, and more time availability to select the cargo bike over the use of a car/truck/auto. Under these circumstances, a woman may be less inclined to purchase a cargo bike if she has a full-time job in addition to parenting/household responsibilities because of time restraints. Additionally, the cargo bike as a family vehicle is functional with younger children, due to their size and weight. As children get older, the cargo bike purpose may change, which may require a different bike model

to accommodate these changes or a transition back to automobile dependency. Given the expense of purchasing a new cargo bike or vehicle, several participants of the study suggested ways for the cargo bike to grow alongside changes to family transportation needs and trip purposes.

Finally, exploring additional research avenues will also help establish the cargo bike as a feasible substitute for a family automobile and increase awareness for the importance of supportive bicycle infrastructure within communities. An increase in cargo bikes, which puts more parents with children on the road, will necessitate changes in infrastructure and contiguous safe routes. As a result, the cargo bike can serve as the platform that motivates attention to the creation of more bikeable, safe, and equitable travel environments in communities across the nation.

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APPENDIX A | Interviews With Mothers Who Cargo Bike

Each participant was given an alias name to preserve confidentiality and privacy

Interview Structure: Example of Interview Questions

Introduction Questions

1. Tell me about yourself
2. Who is a part of your household?
3. Can you show me your cargo bike and describe it a little?
{Picture}
4. How long have you owned your cargo bike?
5. How many cars (if any) do you have in your household?
2 cars; we have a family van and a camper van (which we really only use for camping).

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?
2. What are the primary reasons you DO use your cargo bike?
3. What are the primary reasons you DO NOT use your cargo bike?
4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?
5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?
6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?
7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?
2. What about your cargo bike makes you comfortable?
3. What about your cargo bike makes you uncomfortable?
4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?
5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?
6. Does your comfort level change depending on time of day?
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
8. Does including children on trips influence your level of comfort? Why?
9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?
10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?

Demographic Questions

1. In what year were you born?
2. What is your gender identity?
3. What is your race or ethnicity?
4. What is the highest level of education you have completed?
5. What is your yearly household income?
6. How many people live in your household?
7. How many children, if any, do you have?
8. How many children under the age of 6 live in your household?

9. What is your home zip code?
10. What is the nearest intersection to your home? Write the nearest cross streets, e.g.
Street A & Street B

Is there something else you would like to tell the Cal Poly research team that we did not cover?
[Open-ended response]

Interview Responses:

Interview Questions – Bonnie

Introduction Questions

1. Tell me about yourself

I'm Jaime Hendrickson. I went to Cal Poly in 1996 and earned my BS in horticulture. Currently (past 11 years), I work as the Water Conversation Manager for Atascadero, and I work about 10 hours a week.

2. Who is a part of your household?

I live with my husband, Joe, my 4.5-year-old son, and my 2.5-year-old daughter.

3. Can you show me your cargo bike and describe it a little?

{picture}

Normally, my husband takes the kids to pre-school, and I will pick them up on the cargo bike. My husband won't use my cargo bike because there are too many bike adjustments that have to be made for each parent to ride comfortably.

4. How long have you owned your cargo bike?

Our first cargo bike was a Trek Transport cargo bike, which worked fine for when our son was a year old. We transitioned to a larger cargo bike, the Yuba Mundo (no e-assist), when our daughter turned one.

5. How many cars (if any) do you have in your household?

We own 2ish cars, one family vehicle, one company car, and one car that's about 40 years old.

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?

We average about 2 miles 3-4 days a week, which has to do with us living downtown and choosing a preschool and church within a half mile of our home. On weekends, we can average closer to 5-6 miles, depending on family activities. However, miles really are not the challenge, it is the hills that are the challenge.

2. What are the primary reasons you DO use your cargo bike?

We mostly use it for going to school. We also think it's just the right thing the do; we live close to everything, so why not

3. What are the primary reasons you DO NOT use your cargo bike?

A lot of it has to do with convenience, if it's cold, it's raining, or I am in a big hurry. Depending on the trip, it isn't always faster to bike. However, it is a lot easier to load the kids onto the bike then buckle them into their car seats. The hate their car seats, but they love the cargo bike.

4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?

No; we have family who live up north, so we need our family vehicle to visit. We also use the car to go to Costco, since the bike is limiting. We also don't have any car payments.

5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?

We probably wouldn't ever give up having a vehicle; we would get an electric vehicle and get solar instead.

6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?

We have the monkey rails, custom a baby seat with harness for small child, a modified seat cushion for comfort, and a pool noodle over the ring to add comfort for my son's back. We also use bungee cords to strap the kids' bikes onto the cargo bike. I would like to add a side mirror to be able to see the children and traffic to my left. My husband has not voiced concerns, probably because he is taller than I am. Our son is about the same height as me when we are sitting on the bike, so I can't see traffic super well when I look

over my shoulder. I don't know what e-assist would open up, but in terms of distance and frequency of use, that would be something I would be interested in checking out as an addition to the cargo bike.

7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)
We are limited when we go grocery shopping because of how much the bike can carry.

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?
Yes
2. What about your cargo bike makes you comfortable?
I like being up higher up on the bike, I have a comfortable bike seat, the bike feels fitted to me, and I have no problem reaching the gears or reaching the bike bell. I use the bell often (more of saying "hi", friendly). I also love the power-generated lights that come with the bike. I love not having to worry about packing lights.
3. What about your cargo bike makes you uncomfortable?
I wish I had the key lock. I cannot put my bike in the bike rack. It's chaos with the kids on the bike because of the extra weight, and I can't lift it up and lock it easily. A lot of the bike racks around town don't fit a cargo bike. Another uncomfortable feature is the allowed movement of the child passengers. My son has fallen off the bike once on Higuera—a fairly major roadway. The kids can't move fast in certain motions, and I can feel it when I start moving. I also feel uncomfortable on roadways without a shoulder or with gravel because I feel like I don't have traction. Drivers will also pass illegally and put us at risk. My biggest fear is other drivers, even in my neighborhood.
4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?
I am most comfortable on neighborhood roads. I also feel comfortable on roads with a bike lane.
5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?
I am uncomfortable at major intersections. I think there should be bike turn lanes. I always want to write a letter and tell the City about intersections and risk areas for bikers, especially with kids.
6. Does your comfort level change depending on time of day?
On the routes that I usually take, lighting is not a factor. However, I might feel different on another route, or one I was less familiar with. If you were to ask if my comfort level changes depending on the time of month, I would say yes, sometimes I am just not in the mood [haha].
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
I feel like I have the right to be on the roadway, even if a bike lane is not there. However, I do feel different on roadways that have single versus a double lane. Heavier traffic on double lanes make me feel less comfortable, especially if there are also parked cars. I feel like I have to squeeze between vehicles. A bike lane makes riding a lot more comfortable.
8. Does including children on trips influence your level of comfort? Why?
When the kids are on the cargo bike, they wiggle around a little bit, and I feel it, but their added weight almost feels steadies the bike and makes me feel more comfortable. Whether I have the kids with me, or not, I always try to make eye contact with drivers, and I think drivers are generally more cautious when they see I have the kids on the bike.
9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?

Bike racks are always in the sun, so the bike gets hot, and I feel bad for the kids having to sit on a hot seat. Wind is awful. Honestly, we don't get rain too often, so rain is almost fun to ride in the rain. But, if it's raining, I'm not taking the cargo bike; I drive.

10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?

I don't like putting my kids in 3-point harnesses (car seat), and I don't think we are safer driving our car. I think the odds for getting in an accident are higher driving our car.

Demographic Questions

1. In what year were you born?
1976
2. What is your gender identity?
Female
3. What is your race or ethnicity?
Caucasian
4. What is the highest level of education you have completed?
Bachelors
5. What is your yearly household income?
\$120,000
6. How many people live in your household?
Four people
7. How many children, if any, do you have?
Two
8. How many children under the age of 6 live in your household?
Two (4.5-year-old son, 2.5-year-old daughter)
9. What is your home zip code?
93401
10. What is the nearest intersection to your home? Write the nearest cross streets, e.g. Street A & Street B
Chorro St. and Upham St. (Preschool is on Pismo St. and Broad St. and Church is on Osos St. and Santa Rosa St.)

Is there something else you would like to tell the Cal Poly research team that we did not cover?

[Open-ended response]

I recommend a cargo bike to my friends and I tell them to borrow mine and try it out. It would be interesting to try out a different model and how our use of a cargo bike would be different if we didn't live downtown. We would use it more if we lived outside of downtown. When all four of us are together, we use the cargo bike about 70% of the time. Most of the time my husband will ride with the kids while I ride my new bike, which has a step-over frame, so I can wear a skirt while I ride. In total, we have five bikes, only one cargo bike. We do have a bike trailer, which is easier than using the cargo bike for long distance trips because the kids can fall asleep. However, the trailer does not feel as safe as the cargo bike. We're not set up to get the cargo bike from our driveway, out onto the street. It is hard to back out and sometimes the weight is too much to balance. I also have to think about my route a lot more. If I'm going to Foothill Blvd., don't want to go to Santa Rosa St. I put more thought into my route on the cargo bike because it moves differently than a traditional bike and there are things to learn when you get a longer bike, such as how to take tight turns. My husband has built multiple bikes, but he has never built a cargo bike. It helps that my husband knows how to fix bikes because there have been times when he can make a fix, which saves us from lugging the cargo bike to a bike shop. I know women who do not have someone to help them with repairs, so dealing with transporting their heavy cargo bike is a big hassle.

Interview Questions – Emily

Introduction Questions

1. Tell me about yourself

I grew up in Los Angeles and came to San Luis Obispo in 1997 to go to Cal Poly and study nutrition and cultural anthropology. I graduated, loved it, and stayed. I have had a lot of great jobs, but I came to work at Cal Poly about two years ago to work as a Strategic Marketing and Communications Professional. I am very invested in community, and I love to drive and support students.

2. Who is a part of your household?

My husband, Chris, a Cal Poly grad in civil engineering and 6'3"—much taller than I am. Together, we have a 1.5-year-old who is awesome and funny. She started riding on the cargo bike at about 11 months. We bought a house three years ago, about a mile from campus. We made the decision to not look out of the City of San Luis Obispo because we wanted to be able to get around by bike. Both my husband and I have always been riders of bikes, so we are very comfortable on a bike and rely on a bike to commute.

3. Can you show me your cargo bike and describe it a little?

{picture}

We actually have Billy's (Dr. Riggs') old Yuba Mundo cargo bike. We really like it. We chose it for price affordability and the fact that it can grow with our family.

4. How long have you owned your cargo bike?

Beginning of 2016, and I just started feeling comfortable. The student traffic near campus isn't fun, so I try and avoid going down Foothill Blvd and I never bike on Santa Rosa St. It's great that we live a mile away from work, but we take a bike path or dirt road to get there; we are almost never on roads. Trails and bike paths are better routes because our daughter is so young. The cargo bike design makes me feel like she is safer, and we picked a cargo bike specifically because our daughter is sitting higher up. I didn't want her sitting low.

5. How many cars (if any) do you have in your household?

We have two cars, which we hardly ever use during the week. We use the cars for errands. Our side of town didn't have a grocery store for almost a year, so we would use the car to get to a grocery store elsewhere in town. Also, my husband works from home, so he uses a car to see clients or go to Home Depot.

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?

We ride the cargo bike around town, but it is mostly a mile to and from the Cal Poly campus. We use the cargo bike about 3 days a week.

2. What are the primary reasons you DO use your cargo bike?

We use it for local transportation to and from work, and we use it to get around town for fun and errands like the library or a brewery; we don't use it for grocery errands. My daughter hates the car seat; she screams and does that back arching thing. I typically bribe her with blueberries if we have to drive. She doesn't do that with the cargo bike, she loves the bike. She cries if we don't get to ride it. So, we like using the cargo bike because it's easier to get her on the bike. I think it's more motivating to ride the bike because my daughter is more interested. It is also building confidence in bike riding for my daughter and me. I think women need to show more confidence when they are biking—whether a traditional bike or a cargo bike. On a cargo bike, confidence is stability; you need to be stable and confident when you add your 25-pound child to the bike. We never want to put kids in compromised situation, so safety is huge. If we get women to ride more, they might even start to build bikes that are more women-specific. Yuba bikes, like mine, are largely built for men. I think we need to create more women bikes with shorter stems, greater weight distribution, and always a swoop of the frame. A woman-focused bike also needs a variety of gear ratios and sturdy disk brakes. I think the women

audience would appreciate it. Also, cost. Everything is expensive for a kid (diapers, clothes), there are many expenses, and buying a \$2,000 bike is so expensive and may not be enough of a saving or payoff for some families.

3. What are the primary reasons you DO NOT use your cargo bike?

I work about 55 hours a week, so time is limited. We don't have e-assist, so trips on the cargo bike can take a little longer—especially when there are hills. There is also a challenge with the height and weight difference between my husband and I when we share the cargo bike. It took me longer to adjust and feel comfortable riding with our daughter on the bike than it took for my husband to feel comfortable.

4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?

No; mostly because we haven't had the cargo bike long enough to know how we would function without a car. I also wouldn't get rid of a car because we don't have any car payments and we don't drive that much. But, who knows, we might in a few years.

5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?

We would want to ride the cargo bike longer to decide.

6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?

We have disk brakes, back pad and fenders, breadbasket, and we added the baby seat. We can also have panniers on the side, if we want. Since a cargo bike is more expensive and a bit of a luxury, you want to make sure the add-ons and the bike are good quality and built to last. If you know it will grow with the family and it will make riding the bike safer and more enjoyable, it's a good investment.

7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)

Well, you can't go mountain biking (maybe not with a kid). I used to mountain bike a lot. A reason I don't have e-assist is because I want to use the cargo bike to work out. However, with e-assist I could carry lots of groceries and make it up huge hills a lot easier. I also can't easily transport the cargo bike. If the cargo bike was a little bit smaller, I could transport it a lot easier. The size of the bike also makes it difficult to park. I have to find more room for parking, which takes more time.

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?

I feel much more comfortable now. I faced barriers though. Body size is a factor; the cargo bike felt very top heavy at first.

2. What about your cargo bike makes you comfortable?

People/drivers are aware of a big cargo bike. I think they are more aware than when I'm just riding my bike. Drivers get a little cautious around the cargo bike, especially when they see it is a woman biking. They are even more cautious when they see a woman with a child on the bike.

3. What about your cargo bike makes you uncomfortable?

I feel a lot more comfortable on my bike now. We started off by only riding with our daughter in our neighborhood, but we will go pretty much anywhere now.

4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?

I am most comfortable on a Class three bike lane or trails and dirt.

5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?

I feel uncomfortable Busy streets, like Santa Rosa St. I will ride on Foothill Blvd., but it is not fun. I don't like car congestion, and I don't like the traffic around the Cal Poly

Campus—that's why I like riding when the students are on break and taking trails whenever possible.

6. Does your comfort level change depending on time of day?
I haven't taken our daughter out at night yet, so I'm not sure.
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
I feel more comfortable riding on a street without a bike lane if my daughter is not with me. But, I really only ride the cargo bike if she is riding with me.
8. Does including children on trips influence your level of comfort? Why?
I never really ride without her on the cargo bike, so I don't really know a difference.
9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?
Yeah; heat is okay—I just cover her up. I prefer using the cargo bike in the heat over putting her in the hot car. We have done a little rain, but rain and wind really aren't big factors. They aren't factors mostly because I don't care how fast I'm going when I'm on the cargo bike, I can go as slow as I need to. Since we haven't owned the cargo bike during the spring or summer yet, I bet we will ride a lot more—especially since there will be no students in town.
10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?
I don't like to drive; I get nervous. I have gotten in a car accident, so I still think about it. I feel a lot better on a bike.

Demographic Questions

1. In what year were you born?
1979
2. What is your gender identity?
Female
3. What is your race or ethnicity?
Asian-American French
4. What is the highest level of education you have completed?
Bachelors
5. What is your yearly household income?
\$150,000
6. How many people live in your household?
Three people (plus 2 cats and 10 chickens)
7. How many children, if any, do you have?
One; 1.5-years-old (family may expand in the future)
8. How many children under the age of 6 live in your household?
One
9. What is your home zip code?
93405
10. What is the nearest intersection to your home? Write the nearest cross streets, e.g.
Street A & Street B
Foothill Blvd. and Cuesta Dr.

Is there something else you would like to tell the Cal Poly research team that we did not cover?

[Open-ended response]

We need more women-specific bike options, and make it cool and marketable. Social influence is so important. Crowd source, get women/moms to engaged and test driving a cargo bike. Also, please don't make them pink. Look at San Francisco and look at their urban bike movements. Keep bikes urban and bright colors. Since the cargo bike is pretty bulky and since women are more in-tune to aesthetics, make the bikes look Cool and sturdy. They need to be able to picture themselves riding it.

Interview Question Guide – Rita

Introduction Questions

1. Tell me about yourself
My name is Michelle Shoresman and I graduated from Cal Poly with my bachelors and went on to get my Masters in Public Administration from the University of Washington. I moved back to San Luis Obispo in 2001 and currently work for the County as the Division Manager for Health Care Services.
2. Who is a part of your household?
I have an 8-year- old son and a husband who works as a wedding photographer. He works from the house and can be out of town 20 weekends a year shooting weddings.
3. Can you show me your cargo bike and describe it a little?
{picture}
Yuba Mundo with e-assist
4. How long have you owned your cargo bike?
This is actually our second cargo bike, but I didn't ride the first one because it was too big for me. We sold had our first cargo bike for about a year and a half and sold it to another local family (whom you are also interviewing). We purchased our current cargo bike about a year ago. We got a new cargo bike because the old one had a few maintenance issues we didn't want to deal with—although, not bad enough where we felt about selling it. Since we do all of our own bike repairs ourselves, it was just easier to get a new one.
5. How many cars (if any) do you have in your household?
We have two cars; both cars are prius' and both do not have any car payments.

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?
I generally ride the cargo bike 3-8 miles, twice a week. On days I am not using the cargo bike, I am either using another bike or driving for job tasks further out of town. My husband rides either the cargo bike or another bike most days. We both use the cargo bike to take our son to school, which is about 8 miles, roundtrip.
2. What are the primary reasons you DO use your cargo bike?
We like using the cargo bike to not have to deal with parking. It feels silly to get in a car. Plus, it's fun and riding the cargo bike feels nice. I also feel safer on the cargo bike compared to a regular bike because cars give you more room. On the cargo bike, I feel like I can compete with car traffic a little better. Having the e-assist helps, especially when I need to keep up with cars if I need to turn and cross multiple lanes of traffic. It feels safer.
3. What are the primary reasons you DO NOT use your cargo bike?
For my job, I have to drive 12 miles roundtrip 2-3 times a week. That distance is longer than reasonable on a bike and it's just not convenient. I also have to dress professional, and that can be challenging on a bike. I ride my cargo bike on days when I don't have to use Highway 1 and go to Kansas Ave. Parking the cargo bike can be challenging. Having a bike valet is a big plus for events (such as the marathon tomorrow); I don't take it places I can't lock it somewhere safe. We use a good U lock, we don't use anything less, or we park it somewhere we can keep an eye on it. These bikes are expensive.
4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?
Yes, we have talked about it off and on. Since my husband has to travel for work, I don't want to be stranded if I need a car while he's gone. Plus, we don't have any car payments, insurance is fine, and both cars are prius', so it doesn't cost us much to keep them both.
5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?
It really comes down to my husband traveling for work and requiring a car for work.

6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?
We have a large and a small panniers (which allows me to pack my swim supplies and other items), custom-built seat with a cushion made by my husband, handlebars for passengers (my son), and lights on it. However, the lights that came with it only turns on when the battery is on and they aren't super bright, so we bring additional lights for when it's dark.
7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)
How much I can carry. I end up driving to the grocery store because I buy 4+ bags. With the weight of the bike and me being 125 pounds, it's hard to manage sometimes. However, my husband did carry the Christmas tree on cargo bike, we know it can carry a lot. I would also add that better bikeways would allow me to feel like I can go more places because we would feel safer to do so.

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?
Yes.
2. What about your cargo bike makes you comfortable?
I never rode the old cargo bike because it didn't fit me. This cargo bike that we have now one fits me. I think comfort comes from the size of the bike. I like that it's a semi-step through design. Also, the e-assist is high quality, so it functions in a way the helps me feel more comfortable.
3. What about your cargo bike makes you uncomfortable?
The weight of the bike; I have to be totally balanced before my son gets on. If we're going over a surface where I feel uncomfortable, I'll tell him not to move because it throws the weight balance off. For example, Jennifer Street Bridge can be sketchy, you have to go wide and take the whole turn. When I was first riding this bike and going over Jennifer Street Bridge I would ask my son to get off and meet me on the other side of the bridge because I didn't feel comfortable with him on the bike with me as I rode across that section and I didn't want to put him at risk.
4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?
I really don't have a problem anywhere I ride as long as there is a bike lane, sharrows, or it's a neighborhood street without much traffic. I will wholeheartedly put myself in the middle of the car lane if there is no bike lane. There is a comfort with just being on a bike. So you have to be confident to take the lane when there is no bike lane or it is safer to be in the car lane. You may get honked at, but you have to know your rights and keep you and your children safe.
5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?
I avoid riding on Johnson Ave. with my son on the back of the cargo bike. Johnson Ave. is congested and instead, we look for the most convenient and least congested and most bike friendly route to get around town.
6. Does your comfort level change depending on time of day?
Definitely time of day. I'm less comfortable at night, no matter what mode. I won't ride late at night or early in the morning. Also, during events, like the marathon tomorrow, I think about using my cargo bike, but I would have to leave very early to get to the race on time.
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
Overall, yes. But, the smaller the street, the more comfortable I am.
8. Does including children on trips influence your level of comfort? Why?
Yes, definitely. My son is heavy, so I have to be more careful.

9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?
Wind isn't a factor because of the e-assist. I wouldn't ride in rain, I would drive. However, if it's just a matter of the roads being wet, we'll still cargo bike. Heat isn't so much a concern unless I am heading to work and I get sweaty. If I am just going downtown or around town, heat isn't so much of an issue.
10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?
It's about the same. I am less confident when I am riding my cargo bike with my son versus when I am riding by myself.

Demographic Questions

1. In what year were you born?
1972
2. What is your gender identity?
Female
3. What is your race or ethnicity?
Caucasian
4. What is the highest level of education you have completed?
Masters
5. What is your yearly household income?
\$160,000
6. How many people live in your household?
Three people
7. How many children, if any, do you have?
One, son
8. How many children under the age of 6 live in your household?
None
9. What is your home zip code?
93401
10. What is the nearest intersection to your home? Write the nearest cross streets, e.g.
Street A & Street B
Johnson Ave. and Laurel Ln. (between Laurel Ln. and Southwood Dr.)

Is there something else you would like to tell the Cal Poly research team that we did not cover?
[Open-ended response]

I get a lot of attention when I use my cargo bike, so I think that's a really positive feature, and I hope people will think it's cool enough to invest in one. But, I don't know, maybe not. My husband says he loves it when I ride the cargo bike in a skirt because he thinks it's a form of womanpower.

Interview Questions – Hannah

Introduction Questions

1. Tell me about yourself

I got my BA in environmental studies from SDSU. We moved to San Luis Obispo in 2000. I like gardening, sewing, and crating. I do not currently work, but I run the school garden program at my kids' school, Pacheco elementary. Pacheco is a charter school, so a lot of people commute to go there. I also used to run the safe routes to school program from 2009-2010. Since then, I have seen the growth in the City's biking conditions. I don't know if it's bikers speaking up, visibility of the Bike Coalition, more players in the at the City level...I don't know, but I see improved bike conditions on the road.

2. Who is a part of your household?

There's me, my husband, who is a professor at Cal Poly, and our two kids, ages 9 (boy) and 11 (girl).

3. Can you show me your cargo bike and describe it a little?

{Picture}

We rode a Maiden Voyage Christiania bike. Back when we were looking for a cargo bike option, it was really the only other option for carrying kids other than the attachable back carriers, which I really didn't like. We got our cargo bike from Clever Cycles in Portland, which was the only west coast carrier of cargo bikes. If I got it shipped from the Netherlands it would have been \$1,000 for shipping, and it was already a \$3,000 bike. So, it wasn't easy to get this bike. Since then, options have opened up. It was crazy what we could fit in our bike. I would have the kids and I would put all the groceries in there, all the library books, and I could attach their bikes on it too so they could bike around too. It was awesome; with them in the front, we could have conversations while we were biking. If they are in the back, you can't do that. You have totally different conversations than what you get in the car. You see people, birds, trees, buildings; your perception of your surroundings is so different. Part of that is that fact that you are going a lot slower; you aren't in a hurry, especially when you're going uphill. We did about a 2 mile radius of town because that is where most of our life was., but going uphill was always tough. After the Yubas came out, I realized how I think I would rather pull the weight versus pushing the weight. I don't know if that's really how it works, but it makes sense to me. However, I wouldn't have had the same conversations, and that was my favorite part. I thought I would start seeing these bikes everywhere, and it never really happened. I was recognized all over town, but it never picked up like I thought it would. There was one other family that got the same bike as us around the same time, but that was really it. Then about three years later, the Yuba came out. I still don't see them around as much as I thought I would. They're so cool! I was surprised that not more people bought them. Even for businesses. I think people have a hard time shifting their timeframe and patterns away from the car.

4. How long have you owned your cargo bike?

We had our cargo bike from 2008-2014. We first got it when my son was about 1.5-years-old old. We rode it for about 6 years and until they just got too heavy. I remember coming home one day and saying, "no more." I cried when we sold it though, and the kids were sad. It was a great bike. I would consider getting another cargo bike. Right now I am more car-bound with my kids' activities. It's too hard to ride our bikes everywhere and with all of their stuff. When the kids are old enough to ride their bike without me having to be with them, I would definitely look into getting a new cargo bike to do grocery and household errands. Plus, there are so many more options now. I don't need a huge bike, but I would like to be able to get load all the groceries we need or go to the garden store to get soil.

5. How many cars (if any) do you have in your household?

We have one car.

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?
We would ride about 3 miles a day; our radius was about 2 miles.
2. What are the primary reasons you DO use your cargo bike?
I didn't want to be driving around with my kids everywhere, and I didn't want to be bound to a car. I wanted to get a bike situation to help out. It seemed wasteful to drive around a car when we live so close to everything we need or do.
3. What are the primary reasons you DO NOT use your cargo bike?
Really, only if a destination was too far. I would throw them on the bike otherwise.
4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?
We sold our second car to get the cargo bike.
5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?
My husband can ride his bike to work, so he doesn't need a car, and it is easier for us to share the car. It is very rare we both need the car at the same time since we have goods and services close by. If that wasn't the case, we might not have sold our second car.
When the kids were smaller and we had the cargo bike, I maybe only got in the car once a week, counting weekends.
6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?
We had a rack on the back to really lock things down. The front has a fold down bench so you can fold it down for the kids to sit on or you could fold it up to load more stuff in. There were seatbelts included for the kids, it had electric lights, and it had an awesome Danish lock that locks the back tire. It might seem silly, but it also had a skirt guard, which allowed me to wear a skirt when I rode, which was kind of nice. It had electric lights.
7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)
I would have liked to go up hills better and go further. Having a motor would have definitely increased the range. There is a certain distance that it's not possible or takes too much time.

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?
Yes; it had a huge space to fill up with stuff and the kids, it was fun, and the kids loved it. I might still use that model instead of the Yuba because of how much stuff I can load. I also just loved seeing them in the front; we had great interactions. We got to talk, but also, if they were fighting or eating, I could break up the fight and make sure they weren't choking.
2. What about your cargo bike makes you comfortable?
I like that you are riding up high, I think cars knew I was there. I never felt unsafe.
3. What about your cargo bike makes you uncomfortable?
It was heavy and I wish I could have gone further, but I never felt unsteady; I always had control of the bike. The aerodynamics and weight are my only complaints.
4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?
I always feel more comfortable where there is less traffic...true of any biking experience, I think. I like having a bike lane available and having the signals that react to the bike because getting up to a crosswalk button is really hard on such a large bike. I would take routes that I know would set off the signal, which you are seeing more of now around town.
5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?

I find that cars don't want to share the road, so that can be uncomfortable. I didn't find that cars acted differently with the kids in there either.

6. Does your comfort level change depending on time of day?
No; it was a very well-lit bike and had a headlight that was attached to the wheel. The kids loved biking at night; we threw blankets on them and bundled up. In the mornings, I sewed caps for them to wear under their helmet.
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
Yes, because of the size. It sits high; you're pretty visible. You are higher up than a normal bike, and you take up space on the road.
8. Does including children on trips influence your level of comfort? Why?
I think when you have your kids with you; you are more alert for dangers. I never felt more comfortable/uncomfortable with them in the bike, I was just more aware.
9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?
Heat would; if it was really hot outside I wouldn't go as far. I also would not ride it as much during the windy season here. If you were going against the wind it was like pushing an elephant. I was more likely to ride in the rain than in the wind.
10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?
I feel more vulnerable on my bike, there is just less metal around you...but that's always a risk you take.

Demographic Questions

1. In what year were you born?
1974
2. What is your gender identity?
Female
3. What is your race or ethnicity?
Caucasian
4. What is the highest level of education you have completed?
Bachelors
5. What is your yearly household income?
\$100,000
6. How many people live in your household?
Four people
7. How many children, if any, do you have?
Two
8. How many children under the age of 6 live in your household?
None
9. What is your home zip code?
93401
10. What is the nearest intersection to your home? Write the nearest cross streets, e.g.
Street A & Street B
Johnson St. and Pacific St.

Is there something else you would like to tell the Cal Poly research team that we did not cover?
[Open-ended response]

I think you have to first be comfortable riding as an individual before riding your kids. I know a few parents who wanted to ride a cargo bike with their kids and they tried the Yuba, but since they didn't grow up riding bikes, they didn't like it. You really have to be comfortable riding your own bike through a city to really learn how to bike and know driver behavior. There is so much that goes with being an assertive and confident bike rider.

You should have a strong background of riding so that you feel good about riding your kids around. I think it can be a realistic and normal part of your day when you learn how to use it and depend less on your car.

Since my kids are older now and we don't have the cargo bike anymore, I think about cool add-ons that would make it easier to go on multiple trip and carry all of their stuff that they use for activities at an older age (e.g. my daughter is in banjo practice and she also does roller hockey, that is a lot to carry when you consider her stick, skates, and instrument). We use the car because we don't have anything that we can carry all of her stuff. For a mom trying to get her kids around at an older age, I would suggest looking at add-ons that help with this issue. Another problem we face is when we are bringing a friend home with us from school and that kid doesn't have a bike or they don't know how to ride a bike. My kids have grown up seeing me ride my bike their whole lives, so they feel more confident biking through town. That is something that the cargo bike helped with as they got older. Biking has always been a part of their lives. If there were safer routes, like more bike boulevards, then I would feel safe having a less experienced kid bike home with us; there is too much of a risk otherwise. Today, I bike with my kids to and from school. They have to get a little older before I will let them do it on their own.

Interview Questions – Lisa

Introduction Questions

1. Tell me about yourself

I am an Engineer Manager and work in Santa Maria. I have been working there for about 2 years. My husband is also an engineer, but he works for the bike company, SRAM, in town. So, there are lots of engineers on bikes. Both of us are from east coast, and we came out here in early 2000s when he got his dream job at SRAM. To help find a job, I went back to grad school at Cal Poly to get my Master's.

2. Who is a part of your household?

My husband, my 1.5-year-old son, and myself...plus the dog and cat.

3. Can you show me your cargo bike and describe it a little?

{picture}

It's a Xtracycle, which is a little less common for cargo bikes. This bike retails at about \$3,000 when you count all of the accessories. The baby seat alone was about \$200. We might not have gotten this expensive of a bike if there wasn't a discount for my husband working for a bike-related business. If all three of us are together, I generally ride the cargo bike with our son. If I didn't, I probably would spend a lot of the time telling my husband how to bike because he is a little bit more daring than I am when it comes to biking with our son.

4. How long have you owned your cargo bike?

We have this bike for a year. We put our son on it at 9 months old, and we might have done it earlier if he was able to hold his head up a little sooner. This is our first cargo bike, but I have used a commuter bike in the past. The cargo bike basically takes on the role as my new commuter—so I will ride it for errands even if I don't have our son with me. It's also easier to pull it out of the garage, versus pulling my other bike off of it's hanging hook.

5. How many cars (if any) do you have in your household?

We have two cars; we have a Fiat and a Subaru. We used to have one car for about four years, but then I took the job in Santa Maria, and I needed to drive daily. Putting our son in the car isn't ideal I think it's easier to put him on the cargo bike. He loves it. He requests, "bike ride." Most everything is easier by bike...except Costco trips.

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?

Not too many, total per week is about 4 miles. Our general radius is about a mile. We take trips primarily to go downtown or to the farmers on Broad St. on Tuesdays. I also use the cargo bike to walk the dog; I'll attach his leash to the rails and he'll walk with me as I ride the bike. It's a really steady bike.

2. What are the primary reasons you DO use your cargo bike?

I prefer to bike over drive, especially when I go on errands, like the farmers market. I like riding a bike. It's also easier to ride a bike downtown with a kid. You get to pull up where you want to be. We also live really close to downtown, which makes things a lot easier. I used to walk downtown over driving, so it's a relief that we can bike now. I think I go downtown a lot more because of the cargo bike.

3. What are the primary reasons you DO NOT use your cargo bike?

Trips are just too far sometimes, especially if I am buying something large. I would cargo to the grocery if there was one closer, but there isn't a grocery store near us anymore, and the 3 miles to get to one is too far on the cargo bike. I would also have to use Broad St., which isn't safe to cross, so I end up riding on the sidewalk. I feel especially unsafe when I have my son on the bike.

4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?

- No; because of my job being in Santa Maria. We will always have a car, but we will might drop a car if I worked in town...it just has to do with me working far away.
5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?
Employment location and the fact that we don't have a grocery store nearby. It would be more feasible if you have a grocery nearby
 6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?
We have a Hooptie (similar to Yuba monkey bars), giant panniers, and a padded cushion for when he gets older. I put lights on the bike since it didn't come with any. The bike doesn't have e-assist, and e-assist might make sense if I lived further from downtown and went further distances.
 7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)
I would like to use it for more errands, but there are roadways that are really dangerous, especially with a young child, so I drive instead of cargo bike to certain places because it feels safer.

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?
Yes, I feel sturdy and stable on the cargo bike.
2. What about your cargo bike makes you comfortable?
I like that the cargo bike has the large balloon tires. I also like that the frame is a step through because when you are short, like me, it is important to be able to stand up and steady the bike when you are at a standstill. I also like that I am very up-right and it rides like a beach cruiser.
3. What about your cargo bike makes you uncomfortable?
They're heavy. You have to be careful not to tip it over to one side. But, if it did tip over, it wouldn't be the end of the world. Since there are bars protecting my son and he is wearing a helmet, he would be okay. I think drivers are worse when I'm on my road bike. And I assume that is because my kid is on the bike with me.
4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?
I prefer a neighborhood setting and riding in the street. When my routes permit, I like taking less congested roadways, like Nipomo St., to avoid riding on Broad St. When I get downtown, I'll ride on Marsh because people are going slower compared to Broad St. and Marsh St. has a nice bike lane. When I'm with son, I'll turn at signals and often take two signals to cross an intersection. Without him, I'll turn left without having to be at an intersection with a signal.
5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?
I don't like riding on roads that have too narrow of a bike lanes or no bike lanes, especially on a road with fast moving traffic. 25 mph is fine, there are often times obstructions in the bike path that make it more challenging to ride. Plus, cargo bikes are big, so it's hard to squeeze in somewhere without annoying drivers.
6. Does your comfort level change depending on time of day?
Not really, but I think dusk is the worst. At night you're lit up, and I almost think you're more safe. I have ridden with son at night, and it's fine. I bought a really good bright light, which helps.
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
If it's in a neighborhood setting and there's low traffic, yes. It's different on a road bike because I'm moving a lot faster and people aren't as irritated.

8. Does including children on trips influence your level of comfort? Why?
Yes; I am more cautious with him on the bike. However, I am probably not as cautious compared to other moms.
9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?
Yes; I won't go out in the rain. Wind is a consideration, I might sigh a bit, but it won't stop me. Heat, depends what I'm doing. If I'm going to a friend's house, I don't want to be too sweaty...but don't care if I'm just doing errands. Cold isn't a big deal, I bundle us up. Plus, we aren't moving too fast.
10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?
Sometime the bike is easier to get places, but I don't feel unsafe or safer on either.

Demographic Questions

1. In what year were you born?
1979
2. What is your gender identity?
Female
3. What is your race or ethnicity?
Caucasian
4. What is the highest level of education you have completed?
Master's
5. What is your yearly household income?
\$250,000
6. How many people live in your household?
Three people
7. How many children, if any, do you have?
One; thinking of growing family—there is enough room on the bike
8. How many children under the age of 6 live in your household?
One
9. What is your home zip code?
93401
10. What is the nearest intersection to your home? Write the nearest cross streets, e.g. Street A & Street B
Sandercock St. and King St. (Our radius is a mile and it is why we chose this neighborhood to live.)

Is there something else you would like to tell the Cal Poly research team that we did not cover?
[Open-ended response]

The roads have to allow for cargo bikes. I would cargo bike anyways, but I understand why people don't. It would be intimidating as an inexperienced cyclist to just start riding a cargo bike with the cars and without big bike lanes. As people ride them more, it will grow.

Interview Questions – Amy

Introduction Questions

1. Tell me about yourself
I grew up in Fresno and then went to UC Berkeley for my undergraduate degree and lived in the Bay Area for about seven years. I moved to San Luis Obispo to start the MCRP (Master of City and Regional Planning) program. I worked as a planner for a few years and then dropped down to part time. Recently, I went into early retirement to take care of our three kids.
2. Who is a part of your household?
I met husband in the MCRP program and he is currently the Natural Resources Manager with the City of San Luis Obispo. Together, we have 6-year-old twin boys and a 3.5-year-old son.
3. Can you show me your cargo bike and describe it a little?
{Picture}
It's a Dutch-style bike and I love it. We did have to go up to Palo Alto to get it though.
4. How long have you owned your cargo bike?
We got this bike about three years ago. It's great, it has a removable bench in the front, which is where we put our youngest when he was too small to face forward. We put the child seat in there and he faced his brothers and I could see him. When he got older, he faced forward. Before the cargo bike, we used a trailer, but I never liked how low the boys were.
5. How many cars (if any) do you have in your household?
2 cars; we have a family van and a camper van (which we really only use for camping).

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?
We bike about 3 miles, 5 days a week. Our radius is about 2 miles, and we ride it basically every weekday. On weekends, we either stay around the house or we do trips that require a car. The boys know that if a destination is close, we walk; if it's medium distance, we cargo bike; and if it's far, we drive.
2. What are the primary reasons you DO use your cargo bike?
It's just more fun. I feel less stressed, and I have cool conversations with the kids in front of me. I also use it without the boys. I'll take it to get groceries or get soil and plants.
3. What are the primary reasons you DO NOT use your cargo bike?
The distance; the farthest we have taken it is Trader Joes.
4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?
One of our cars is a camper van, so there is no value in selling it and no one is driving it unless we're camping.
5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?
I would love to get rid of the camper van, but my husband is nostalgic.
6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?
I have a coffee cup holder, panniers, and a bell. I used to have a place for a flower, but one of the boys broke it. We also used to have a temporary baby seat, but our youngest doesn't need that anymore. The bike comes with everything else. It has integrated lights and it comes with seatbelts. You can get a lot in there, especially since you can lift up the bench. It's also super easy to clean; you can just hose the thing off.
7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)
I can't make the turns on the Jennifer Street Bridge. I would also love to go out to Avila, but the distance is just too much and it's too much weight.

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?
Yes
2. What about your cargo bike makes you comfortable?
It's so big, it feels so sturdy, and I can see the children. It's a Dutch bike, so it's really well-designed and very solid. The boys can climb all over it and it won't tip. Plus, riding this bike is also the only time I get to exercise, so I have to feel comfortable on it.
3. What about your cargo bike makes you uncomfortable?
It's tough when all the kids are in it, or their friends; they look around and shift their. But, my two older boys are riding their own bikes, so I have less of them in there. It also works out great if I need to take a son's friend home because they can just hop in the cargo bike, if they don't have their own bike. I also don't like it when cars speed by me.
4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?
The neighborhood setting, definitely.
5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?
I don't like major crossings that are uncontrolled. I always take the path of least resistance. It's really tough when I face major inclines and I have to stop because it's really tough to get going again.
6. Does your comfort level change depending on time of day?
I don't ride much at night; rush hour is a hard time for us. Cars are less patient. I think morning rush is the worst.
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
Yes; it depends on the situation, mostly car speed. But, it's such a big and wide bike, I feel fine.
8. Does including children on trips influence your level of comfort? Why?
Not really; they are used to it and so am I. I am less patient with drivers when I have the kids.
9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?
Yes; middle of the summer, we aren't going travel that far. Once we got caught in a major rain downpour, and the kids hated it. They asked if we could never ride in the rain again.
10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?
I am more comfortable on my bike. In the car, I'm more distracted and kids are less behaved. The kids can look at more and connect to more when we are biking. At 3-years old they were talking about deciduous trees. To the kids, biking is normal. There are days that I just don't feel like biking, but they will say we have to because where we're going isn't that far away.

Demographic Questions

1. In what year were you born?
1977
2. What is your gender identity?
Female
3. What is your race or ethnicity?
Caucasian
4. What is the highest level of education you have completed?
Masters
5. What is your yearly household income?
\$98,000

6. How many people live in your household?
Five people, a dog, and 9 fish
7. How many children, if any, do you have?
3 boys; twins are 6-years-old and youngest is 3.5-years-old
8. How many children under the age of 6 live in your household?
One
9. What is your home zip code?
93401
10. What is the nearest intersection to your home? Write the nearest cross streets, e.g.
Street A & Street B
Buchon St. and Morro St.

Is there something else you would like to tell the Cal Poly research team that we did not cover?
[Open-ended response]

The notoriety of riding the cargo bike is difficult in a town this size. I feel great if a college girl sees me and thinks she can bike with kids when she's a mother, but then there are times that I stand out too much. People take pictures of the bike and my kids. I also see San Luis Obispo changing. I think the speed people are moving is faster. Everyone is a little grumpier and less patient. That is something I am aware of and notice when I bike around. But overall, I feel confident on my bike. It freaks my parents out...but that's just because of biking in general. I like the convenience of being able to park anywhere. For instance, we recently met a family downtown at ice cream after school, and we were sitting and eating our ice cream even before they even parked. It's just quicker. I also want as little time in the car as possible. Thinking about the design of the bike for women specifically, women trip chain more, so they need a trunk. My bike is my trunk. Fortunately I live in an area where I trust people because I can't lock my stuff up like a car trunk. In terms of design of the bike, the walk-through bike is great. Women aren't expected to wear pencil skirts here, but that might be different in other cities, so that design matters.

Interview Questions – Emma

Introduction Questions

1. Tell me about yourself
I grew up in Davis, CA and went to Cal Poly for kinesiology. I moved away and then moved back later when my husband got a professor position at Cal Poly. Professionally, I used to be a teacher before having kids. I am currently in the stage of starting my own personal trainer instructor business. I am working about 10-15 hours a week right now, which is really the most I can handle with my youngest in preschool.
2. Who is a part of your household?
There are four of us; my husband, myself, and our two kids, ages 4 (son) and 6 (daughter).
3. Can you show me your cargo bike and describe it a little?
{picture}
I love it; it's an Xtracycle with no e-assist. I like the workout I get.
4. How long have you owned your cargo bike?
We have had this bike for two years, and it's our first cargo bike.
5. How many cars (if any) do you have in your household?
We have one car. My husband bikes to work every day.

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?
We don't ride it everyday, but we use it about three times a week and we ride it across town to get to preschool, which is on the top of Johnson St. I go over Jennifer Street Bridge, which is great, but I rely on my bell because this bike is so large, I can't make turns with it if another biker is near me. But, they almost always stop when they see me with a kid on the bike and let me pass.
2. What are the primary reasons you DO use your cargo bike?
I like the exercise. I also like biking with my kids; I like the message it gives them. My kids know that cars create gasses that aren't good for the earth, and biking is a smart thing to do. They also get to see me ride my bike and getting exercise. Biking is a part of my history, growing up in Davis, so it's an activity I really enjoy and I like doing with them. Also, I'm not a hardcore roadbiker, I like biking for the enjoyment and getting a workout. I feel like I get that on the cargo bike; I have a purpose when I use it and I can get the exercise.
3. What are the primary reasons you DO NOT use your cargo bike?
Mostly shortage of time; especially if I'm taking my son to school and I need to do something after that is too far away or I need to pick up something that's too big for the bike.
4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?
Since my husband bikes everyday, our second car just sat there, so we sold it right after our first child was born. Once both kids were at toddler stage, I wanted an alternative to get around. We had a bike trailer for a bit, but our kids are really tall for their ages, so they outgrew it quickly. The cargo bike was a great option. I saw other moms doing it, and I decided I could do it too.
5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?
We wouldn't give up our only car, having one car is good enough for us. We are thinking we will need another car when the kids get a little older and have more activities.
6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?

We have side bags, a cup holder, a bell, and bars (Xtracycle Hooptie) for the kids to keep them safe. We also have stirrups for our son to help him balance, since he can't reach the foot rails.

7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)

I can't carry both kids anymore; they're too heavy. But, our daughter is old enough that she can ride her own bike. There are parts of town that have bad roadways that I won't go on (e.g. Tank Farm and S. Higuera). But overall, I'm happy to be able to bike around town and feel safe in most places around town.

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?
Yes
2. What about your cargo bike makes you comfortable?
I like that my kids are attached to the bike and not trailing on the bike. I think they're safer. I really like the Hooptie around him. They don't so much need it now, but it was important when they were younger.
3. What about your cargo bike makes you uncomfortable?
Initially with the kids, the kids had to learn how to not wiggle because I needed to feel stable., especially going uphill. It didn't take long to learn and I feel very safe when I ride with them.
4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?
It's always nice when there is a healthy bike lane. If the bike lane isn't widened, having a buffer zone (like on Chorro St.) is nice. I appreciate the sharrows because it lets the cars know that bikers can be in the lane. I have learned to feel more confident about taking the lane, and that's the reason I feel safe.
5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?
No bike lane, no sharrows, and when cars don't know what to do with a biker on a shared road. I have gotten a lot of angry gestures from drivers, even when I have the kids with me. I have also had cars try and pass me too quickly, which shakes me up a bit, just because I'm trying to keep myself and my kids safe. Many drivers just don't know how to behave.
6. Does your comfort level change depending on time of day?
If it's a 5pm or 8am when there is a lot of cars on the road, that's not fun. It's not too much about their speed, it just the fact that there is more of them on the road.
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
Yes, but I think there is a degree of feeling uncomfortable. I take the lane enough and I do it enough that I have built up comfort.
8. Does including children on trips influence your level of comfort? Why?
I'm thinking about safety, always. I feel like it influences cars to be more patient when kids are included on the bike, and that changed behavior is good.
9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?
Rain does and wind can occasionally, if it's really windy. Heat doesn't really impact me; it wouldn't convince me not to bike.
10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?
I'm more comfortable in the car, but by a small margin. I think the kids observe more on the bike than in the car. They are in the environment versus in the car. When the two of them are on the bike, they are quieter because they are engaging with other people and

their surroundings. In comparison to the car, it is harder to talk with the kids because they are behind me and if I turn around to talk, it affects the bike.

Demographic Questions

1. In what year were you born?
1976
2. What is your gender identity?
Female
3. What is your race or ethnicity?
Caucasian
4. What is the highest level of education you have completed?
Undergrad + Teaching Credential
5. What is your yearly household income?
\$90,000
6. How many people live in your household?
Four People
7. How many children, if any, do you have?
Two children, 6 (daughter) and 4 (son)
8. How many children under the age of 6 live in your household?
One
9. What is your home zip code?
93405
10. What is the nearest intersection to your home? Write the nearest cross streets, e.g.
Street A & Street B
Ramona Dr. and Del Mar Ct.

Is there something else you would like to tell the Cal Poly research team that we did not cover?
[Open-ended response]

I would like to find ways to encourage more moms get out there and bike more, whether with kids or not. I have friends (other moms) who say that they would like to bike with their kids, but they feel nervous about it, and I think it's because they didn't grow up biking and they don't have that comfort level for biking in a city. In places like Davis, moms would totally do it; streets are flat, bike lanes are wide, and everyone bikes there. Here, there are hills, cars are less aware of bikers, and the infrastructure isn't as bike-friendly as it could be, especially when we are talking about including kids.

Interview Questions – Hillary

Introduction Questions

1. Tell me about yourself
I have lived in San Luis Obispo for 14 years. I grew up in Camarillo, CA and went to school at UCLA and then Berkeley before finding my way to SLO. I was in journalism and education for most of my professional life. I am currently transitioning to computer science and working and taking classes when I can. I am currently doing at-home contract work, so my office is my home.
2. Who is a part of your household?
There is myself, my husband (who is an ER doctor at Sierra Vista, which is a mile away), and our 8 year-old son.
3. Can you show me your cargo bike and describe it a little?
{picture}
Our friend built a bike (actually the husband of another mom you interviewed), and it has an e-assist system included. Out of all the material items I have, the cargo bike is my favorite.
4. How long have you owned your cargo bike?
We got the cargo bike in mid-October, right before Halloween. I remember because on our first trip to farmers market, bought a skeleton and brought it home on the bike. Both my husband and I use the bike, but I definitely use it more. We use it for all types of trips, including date night, which is fun.
5. How many cars (if any) do you have in your household?
2 cars

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?
I would estimate 5 miles a day.
2. What are the primary reasons you DO use your cargo bike?
We take it to school, going downtown for meetings, biking across town to go to farmers market, and we take it on dates. There are very few places in town that we feel like we can take it.
3. What are the primary reasons you DO NOT use your cargo bike?
There is really only two reasons: 1) I need to haul something that is too big 2) If I am hoping for a workout. Sometimes I will use another bike if I want a more intense workout.
4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?
Yes, we have talked about it. One of our cars is old, and we talk about how much we love our cargo bike and that we don't need to replace that car when it dies.
5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?
We probably will. We hardly drive our older car and it won't last much longer. Going down to one car will just happen.
6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?
We have side bags, handlebars on the back (usually used for transporting a person), and a front basket with netting. The cargo bike also came with lights, but since it's not currently working, we have a separate bike light set.
7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)
Fly? [Haha] The bike is not the most stable over loads of 100 pounds. Other cargo bikes are built to carry bigger loads. I could see how that might come in handy. There is also a big height difference between myself and my husband, so it requires a few tools to make adjustments to fit each of us—but that's not too hard to do.

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?
Yes, very.
2. What about your cargo bike makes you comfortable?
It's really less about the bike itself than more about the fact that I have had a lot of bike safety education. I know where I can be on the road and I know how to act around or react to driver behavior. The e-assist battery gives me more confidence because it allows me to keep up with traffic.
3. What about your cargo bike makes you uncomfortable?
I can't think of anything.
4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?
I like riding on streets where there is enough room to ride side by side with a car, but that is referring more to neighborhoods rather than main arteries. I don't feel comfortable when cars are flying by, like they do on major roadways. I like riding on Morro St. and the Madonna bike path. I also enjoy riding straight through downtown because I feel that there is plenty of room and cars aren't traveling very fast.
5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?
I don't like roads where cars are moving fast (e.g. Santa Rosa St.) or when there is not a bike lane. One car got frustrated when I was in the roadway and he drove very close behind me and then sped around me. I eventually caught up... I always catch up... and let him know how I felt about his behavior. The road we live on, Broad St., was less comfortable to ride on before the sharrows were painted and the signs went up that explained to cars that they have to share the roadway. It's amazing how much paint can help.
6. Does your comfort level change depending on time of day?
I think I am more comfortable during the day, and I tend to avoid areas where cars get backed up
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
Yes, but I feel more comfortable with a bike lane, and more so on roads with a buffered bike lane. In terms of level of comfort, I would rate it as: 1) A road without a bike lane or striping as my lowest level of comfort 2) sharrow on the road 3) bike lane provided on the road 4) buffered bike lanes is when I am most comfortable.
8. Does including children on trips influence your level of comfort? Why?
Not really, if I had younger kids I might be less comfortable. I would be worried about their decisions while they were on the bike. But our son knows the rules, and he knows what to do. I also noticed that driver behavior doesn't change much on the cargo bike, but with the both of us on there, we are a big creature on the bike together, which is hard to ignore.
9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?
Not so much, but if we have a heavy downpour, I probably wouldn't ride. With wind and heat, there isn't really an issue. It's pleasant to be out on the bike.
10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?
I feel stuck in a car, I like being outside, and being out in the open air. My car is gross, there are cracker crumbs in there. You're probably safer surrounded by 2,000 pounds of steel, but it's not something that I think about to deter me.

Demographic Questions

1. In what year were you born?

- 1973
2. What is your gender identity?
Female
 3. What is your race or ethnicity?
Caucasian
 4. What is the highest level of education you have completed?
Masters
 5. What is your yearly household income?
\$200,000
 6. How many people live in your household?
Three people
 7. How many children, if any, do you have?
One, 8 years old
 8. How many children under the age of 6 live in your household?
None
 9. What is your home zip code?
93405
 10. What is the nearest intersection to your home? Write the nearest cross streets, e.g.
Street A & Street B
Broad St. and Mission

Is there something else you would like to tell the Cal Poly research team that we did not cover?

[Open-ended response]

People are so fearful about biking with kids, and they believe that there is only one safe way to transport a child, in a vehicle. I know that that is not the case. I would like to see if having a situation where the child is on the same bike as you reduced the fear barrier. I think there is a psychological barrier, and it requires a lot of bike education. I think mothers, or anyone who cargo bikes, needs to be a confident bike rider before getting a cargo bike. If that confidence is built up, I think cargo bikes can increase bike ridership and create safer roadways.

Interview Question Guide – Kate

Introduction Questions

1. Tell me about yourself

I am almost done with Master's at Cal Poly, also in City and Regional Planning. My thesis is on non-profit solar. My undergrad was at Colorado Collage, and I studied History and Political Science. I was raised in the Bay Area, in San Carlos. I don't work full-time now; I used to work about 20 hours a week at the construction business my husband and I own, but I reduced my hours when I was in grad school and when I got pregnant with our second daughter.

2. Who is a part of your household?

There's my husband, our two daughters, and me. Our oldest is almost 3.5-years-old and the youngest is about 6 months old. My mom lives nearby and is at our house a lot.

3. Can you show me your cargo bike and describe it a little?

{picture}

I can fit two kids and 4 grocery bags, easily. I't not a fast ride, but it's great. Larry vs Harry makes the bike. It has so many gears; it can handle a lot.

4. How long have you owned your cargo bike?

Our oldest daughter was 1.5-years-old when we got the bike, so about 2 years. I had to sell it to my husband since it cost \$1,300, but originally \$5000. We bought it from a friend, used, so it was a good deal. I like that I can use it for going to the store or a workout. I sold it to my husband as preventative healthcare. I didn't have time to exercise, so if I wanted to stay healthy, I needed to make exercise and getting around town the same thing. It becomes a part of your life. Errands become a workout.

5. How many cars (if any) do you have in your household?

We have 2 cars, but we may be getting another one soon because one car will become a company car and I will get my soccer mom car.

Transportation and Behavioral Questions

1. How many miles do you ride your cargo bike on days that you use it?

We only ride it around Los Osos, so we max out at about 5 miles a day.

2. What are the primary reasons you DO use your cargo bike?

It is our transportation to school, which is 4 blocks away. We also use the bike for grocery shopping, the post office, the bank, or going down to the bay. I never felt very safe taking the bike with the kids into Montana de Oro because of the roads being so narrow and cars moving pretty quickly. I have gotten run off the road too many times.

3. What are the primary reasons you DO NOT use your cargo bike?

We ride in the rain, we have rain gear, so that isn't an issue. It's really only if I have a flat or because our youngest isn't stable yet. We want to wait to ride with her until she is a little bigger.

4. Have you thought about giving up ownership of a car, truck, or other motorized vehicle as a result of your cargo bike?

If we lived in a more urban environment, absolutely. When I lived in Portland or the bay area, I didn't have a car, but it's a lot harder with kids. With kids, naps and feeding and activities all have to be coordinated, which takes more time. Activities and errands are more spread out here, a car is needed sometimes.

5. If you have thought about giving up a car, truck, or other motorized vehicle, what would it take to get you to do so?

A different living environment.

6. What type of peripherals or add-ons do you have on your cargo bike that are important to you?

We really like having a quick release on the seat because we both ride it and we're both different heights. There is also a mesh bag that is great for holding a wallet or phone while I bike. We also have two panniers on the bike for grocery bags. We have attached

all sorts of things to this bike. We have strapped a cooler to it, we have a solar shower that we fill it up with water and I can bring to the bay to wash off the kids and their friends. We can also put our daughter's bike or scooter on the bike so she can ride once we get somewhere.

7. What are the things you currently can't do but would like to on your bike? (Think about all things you might like to do but currently don't do on your bike.)
There really isn't anything. I have a mountain bike wheel attachment for it, so we can take it camping. It's the coolest that ever happened in the my post-baby life—besides my kids.

Safety and Perception Questions

1. Do you feel comfortable on your style of cargo bike?
Yes
2. What about your cargo bike makes you comfortable?
It's so big; in town, I think people see me. People stop to talk to me. I have had trucker guys stop, old ladies stop, neighbors stop. I like having the kids on the bike, compared to a trailer behind me. I don't like the back trailers. I tried one out when we were deciding between getting a trailer or a cargo bike, and I couldn't hear my kid or see my kid, which I didn't like. Cars also can't see the trailer with the kid(s) in it because they are so low. I fell the first time I used it, and I have fallen with our oldest daughter in it once. We were both totally fine because she knows the rules and we ride with hands in. It's important to have hands in because it's more protective and less dangerous if a car were to hit us.
3. What about your cargo bike makes you uncomfortable?
I feel uncomfortable only when east of South Bay Blvd. on Los Osos Valley Road. Once, I was taking our oldest to an activity for her class and the cars were whipping by.
4. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most comfortable riding your cargo bike?
I like roads with no cars and wide back streets. I also feel comfortable when I know people can see me because cars will slow down. It's such a novel bike it makes me feel safe.
5. What type of environment (style of roadway, neighborhood setting, trip purpose, etc.) do you feel most uncomfortable riding your cargo bike?
Even though I do take the lane, biking in the lanes of traffic makes me feel uncomfortable. Los Osos doesn't have a daily biker population, so there is a handful of people who commute locally, and cars are less trained on how to drive with bikers. I think I am much more at risk. I can bike aggressively and I can take the whole lane, but I don't want to have to take that risk, especially with the kids. However, I do find that driver behavior changes when the kids are with me. I find that I get two types of reactions: I get a high-five 'you're awesome' or dirty looks. People are super impressed or they think I am crazy, even from other moms. I usually get more positive feedback from dads/men. They like the gears.
6. Does your comfort level change depending on time of day?
No, ride at night; in the winter it gets dark early, so we're used to it. I have lights and we can bundle up.
7. Do you feel comfortable riding your cargo bike on a street without a bike lane? Why or why not?
Yes, absolutely.
8. Does including children on trips influence your level of comfort? Why?
Yes, because I ride more defensively. Especially when I have a friend of my daughter. I make sure I come to a complete stop at the stop sign and I am double checking I am looking both ways. I want to be seen and drivers see me. Eye contact is very important.
9. Do environmental conditions (rain, wind, heat) influence your level of comfort? Why?
No; you just have to go with it. We have the gear to handle anything. If it's too hot, I dress her down. If it's cold, we have a blanket and scarves. It rains minimally here, so that isn't

much of a issue. Plus, where the kids sit in the bike, they have a water repellant cover. If I still lived in Oregon, I would get a rain protective dome, and we would still ride.

10. How does your comfort level between using a cargo bike and using a vehicle compare against each other?

Now with a family, my perspective is a little different. I would take more risks on a bike before children, and I don't take those risks with kids. I think if you get hit in a car vs. a bike, you're going to experience trauma, and that doesn't go away. I think there is a greater chance of dying on a bike and you may be more vulnerable on a bike, but I try not to think about it, honestly. The fear of biking or driving isn't what gets me out the door. The distance I have to travel is what I think about over safety, so a bike and car have different roles, and I depend on a car to take me further.

Demographic Questions

1. In what year were you born?
1979
2. What is your gender identity?
Female
3. What is your race or ethnicity?
Latina – raised half of my life in Peru.
4. What is the highest level of education you have completed?
Bachelors, but finishing my Master's in June
5. What is your yearly household income?
\$150,000
6. How many people live in your household?
Four people
7. How many children, if any, do you have?
Two
8. How many children under the age of 6 live in your household?
Two
9. What is your home zip code?
93402
10. What is the nearest intersection to your home? Write the nearest cross streets, e.g.
Street A & Street B
Mar Vista Dr. and Broderson Ave.

Is there something else you would like to tell the Cal Poly research team that we did not cover?

[Open-ended response]

I would suggest for women to test out a cargo bike. It's hard in our area because there are few vendors, so finding other moms to test ride the bike would be good. The other thing I would tell other moms is how great of opportunity it is to bond with your child(ren). There is an adventure every day. I feel like the fearless flier. You have everything you need and you can get anywhere you want. There is immeasurable opportunity. Being a mother is very isolating and lonely and depressing; everyone is on her own baby schedule. So, unless you find a mom with a child that is on the same schedule as yours, you're solo. My daughter riding with me became my partner in crime; we really bonded. Plus, you see things differently on the bike with your children than you do from inside a vehicle. She can articulate how many trees she sees, and all of these questions come up when you see things on your tip, like road kill. What is that?! The bike ride turns into a freeform classroom. You get to be outside, getting live experiences, and exercising together. It's great; one of my girlfriends got a cargo bike because I was talking about it so much.