

## Team UrbanFamilies - M2.2: PMR Plan, DoE & Hypothesis Testing

### PMR Plan

We were interested in speaking to people who had young children, lived in urban areas (preferably ones that were large enough to have a transit system and an Uber/Lyft presence), and either had no car, limited access to a car, and/or frequently took multiple modes of transportation. Because we felt that approaching people at train stations would be both unproductive as well as dangerous due to the pandemic, we tried to reach out to candidates through personal and online networks, such as the MIT graduate families WhatsApp group. Our message to the group read as following:

*Hello grad students and families,*

*Have you ever struggled to travel around the Boston area with young children? If so, we would love to hear from you. We are working on a project for 11.029 (Mobility Ventures) that seeks to make urban travel more viable for families with young children, whether by bike, foot, car, or on transit. We would greatly appreciate your input to better understand your needs.*

*If you are interested in having a short chat with our team about your experiences, please email [urban-families@mit.edu](mailto:urban-families@mit.edu) and we can set up a call.*

So far, we have interviewed 5 graduate students and one MIT professor, asking them questions such as:

*1) What city do you live in? 2) How many children do you have and what are their ages? 3) What challenges have you faced when traveling with kids? 4) Can you walk me through the last time you traveled with kids? 5) Can you tell me about your worst travel experience with kids? Your best? 6) Do you own a car? Why or why not? If yes, when do you prefer to use it and when do you choose other modes? 7) What modes of transportation do you usually use? 8) How does trip/activity type affect the kind of mode you choose to use?*

We were surprised at how, in most of the interviews, the interviewees were very excited to share their thoughts and stories. This solidified our prediction that this would be a topic where people would be excited to see some change.

### Ranked List of Hypotheses

Based on what we learned in the interviews, we formed the following hypotheses. The top 5, ranked in order of what we felt were most important to test, are:

- 1. (Selected) I believe parents with toddlers will use a stroller that converts into a backpack quickly because it will allow the parents to have a hands free option for carrying the stroller, especially as a carry on item on the airplane, when their kids decide to get up and walk in the city, when traveling on public transit and trying to minimize the space they are taking up, or when parents need a last-mile solution when moving between transit options with children.**

2. I believe that parents with toddlers will use a stroller that quickly converts into a car seat so that they can use ridesharing services without having to carry additional items.
3. I believe that ridesharing services will carry quick-install car seats so that ridesharing services can increase their market share by enabling parents with toddlers to use the service.
4. I believe that a parent who commutes via bike with his/her toddler will use a bike with a balancing mechanism, such that he/she no longer has to worry that their bike will fall over and injure their child as they strap their child into the bike seat (or remove their child from the bike seat).
5. I believe that public subway stations will carry a mechanism that allows strollers to travel up/down stairs or escalators safely so that riders requiring an accessible option have a method to navigate subway stations when elevators are broken down.

### Rationale for Chosen Hypothesis

In our user interviews, we heard time and time again the challenge of strollers across various use cases. Various frustrations were expressed - carrying too many items, guilt of taking up too much space, feeling like it was impossible to move with your kids, luggage, and strollers. This same sentiment was expressed at the grocery store with groceries, children, and the stroller making it a challenge to carry everything. Due to the repeated frustration over strollers in multiple interviews and across use cases, we decided to take on the challenge of redesigning the stroller. Doing a quick product search, there are currently very few “easy carry, quick transition” strollers available, and the ones that are available do not fully meet the user's needs.

### Hypothesis Test Design - Anubhav, Harry

To test the hypothesis chosen, we propose the following experiment design:

<b>MVP</b>	A prototype of a basic functioning stroller (i.e. a child could sit in it, but won't have all the safety or convenience features) that can be easily and quickly converted into a form that can be carried without using one's hands (e.g. has shoulder straps of a backpack).
<b>Experiment</b>	Test transformable prototype (with size, weight, material) with parents who currently own a stroller for specific tasks, and ask them give feedback on the experience and rate which stroller they would prefer using for the given task. The first priority tasks would involve tasks related to accessing public transit (trains, buses) such as climbing up/down stairs, entering or deboarding a bus, and finding space to sit/stand in the vehicle. These could be done in simple, simulated sets/software rather than actual bus/trains.
<b>Duration</b>	15 min per experiment, including feedback.
<b>Currency</b>	Trying the solution once and giving feedback.
<b>Metrics/Threshold</b>	% of participants who would prefer to use the prototype stroller over their existing stroller for each task; prototype cost and durability.