



ARE WE THERE YET?

Are We There Yet? is an experiment evaluating whether continuous positive reinforcement of existing environmentally friendly behavior can motivate college students to form sustainable transportation habits. Inspiring this type of behavioral change is an inherently difficult problem for two reasons. First, there is no immediacy of results. If an individual improves their behavior they will not see results for some time. And if they do see result, it will be on the scale of the larger population, not the individual. Second, each person plays a small role in the larger problem. This means the responsibility on the individual is small and it is easy to feel as if individual behavior will not make a difference overall.

CHALLENGE

Two CAMD professors, Ann McDonald and Mark Sivak, approached Scout looking for a fresh perspective on an ongoing research project on increasing environmental awareness and sustainable behavior among people in their transportation habits. They allowed the Scout team to use a different approach in defining the problem (and, eventually, the path to a solution). Through background research, user data, conversations with experts, and interaction/interface design, the Scout team came up with an experiment to collect the data we need.

Unlike any of Scout's previous projects, this project posed a unique challenge: there was no tangible problem to solve, no concrete deliverable to work towards. The project was completely open for us to discover and define on our own.

DIVING IN

We decided to start out by gathering research on the general topics of transportation and sustainability, including some major questions such as these:

- 1 *What methods of transportation are the best/worst for the environment, and by how much?*
- 2 *Why do people use the forms of transportation that they currently use?*

3 *What are the benefits of using sustainable transportation?*

Our next step was turning to nearby experts in the field. We reached out to Peter Furth, a professor in environmental engineering, and sat down with him to pick his brain about sustainable transportation. We learned about a variety of topics we hadn't even considered, such as parking management, environmental impact studies, and transportation priorities. We also talked to Maura, a student from the Divest NU initiative (an on-campus group with the goal of getting Northeastern to divest all endowment from the fossil fuel industry), who brought up interesting points about overhauling the entire transportation system and where that could lead.

INFORMATION HUNTING

We do our best to promote human-centered design at Scout, so we decided the best thing was to go out and start talking to people. We started by talking to our (college) friends about the way they use transportation, and then ventured into the public to get a wider perspective to speak with people who use the transportation system on a regular basis. We went to South Station (a busy bus/train/commuter rail station) on a weekday evening.

What we found wasn't all too shocking, but incredibly important for the direction of our project:

Most people just don't care about the environment.

It's not that people are callous or careless, it's that they prioritize other things instead. Common reasons for driving instead of a longer commuter rail ride or taking an uber instead of the bus included time, money, comfort level, and convenience. We began considering ways to change transportation behavior with their priorities in mind.



OUR TURNING POINT: A NEW APPROACH

Due to the fact that a constraint of the project was to change people's behaviors while educating them about the environment, we backed up to assess whether we were heading on the right path. We decided to organize our existing research and form a new hypothesis. We gathered even more government research and heavily sourced scholarly articles about the psychology of motivation, as well as the data we had

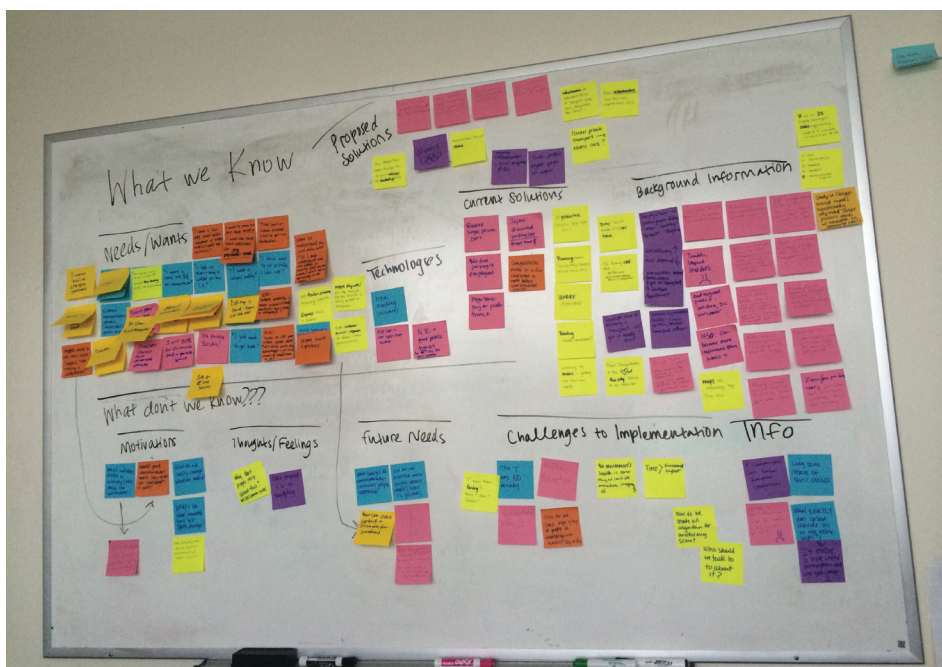
already collected from users. We participated in a sticky noting brain dump exercise in which we outlined the general population's needs/wants, proposed/current solutions, background information, and more.

OUR DESIGN CHALLENGE

How might we adapt people's transportation habits to reduce carbon emissions, while educating them on the importance of their impact?

OUR NEW HYPOTHESIS

If we provide an evaluation (long-term or one-time) of a user's environmental impact of their transportation habits, then that user will be motivated to improve them.



We then turned to a psychology professor, Professor Ricci, PhD, who could tell us more about motivation. Our initial assumption, going into this meeting was that the most effective way to create change in people's behavior was through an appeal to emotion. We proposed taking someone's behavior and showing them how it could negatively impact their life. For example, we could show them how their actions are destroying the environment for their (future) children's generation.

However, in talking with Professor Ricci, we gained a new understanding of human behavior. Essentially, when being told their behavior causes damage, people become defensive and begin to rationalize. They view it as a type of personal attack. We discussed the classic example of this approach: anti-smoking ads. These ads show the negative results of smoking, highlighting how terrible it is for your health. Though it's well known that smoking is extremely unhealthy, why have these campaigns not been effective? It's because people rationalize their behavior in the moment. They may think, "I smoke now, but I'm going to quit soon. I can't do too much damage if I only smoke for a little while longer."

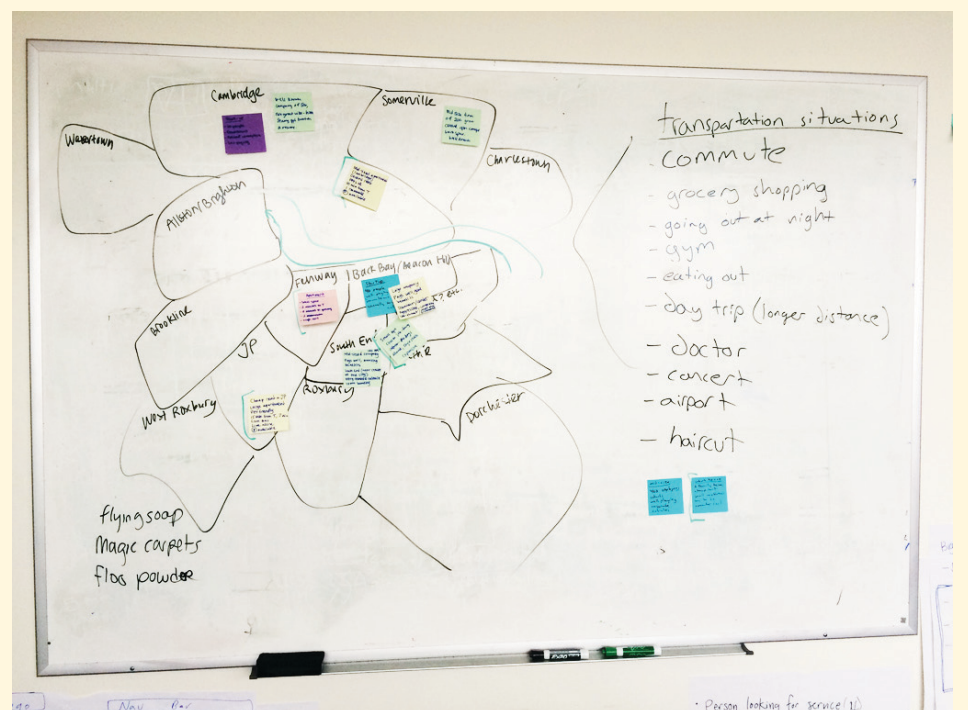
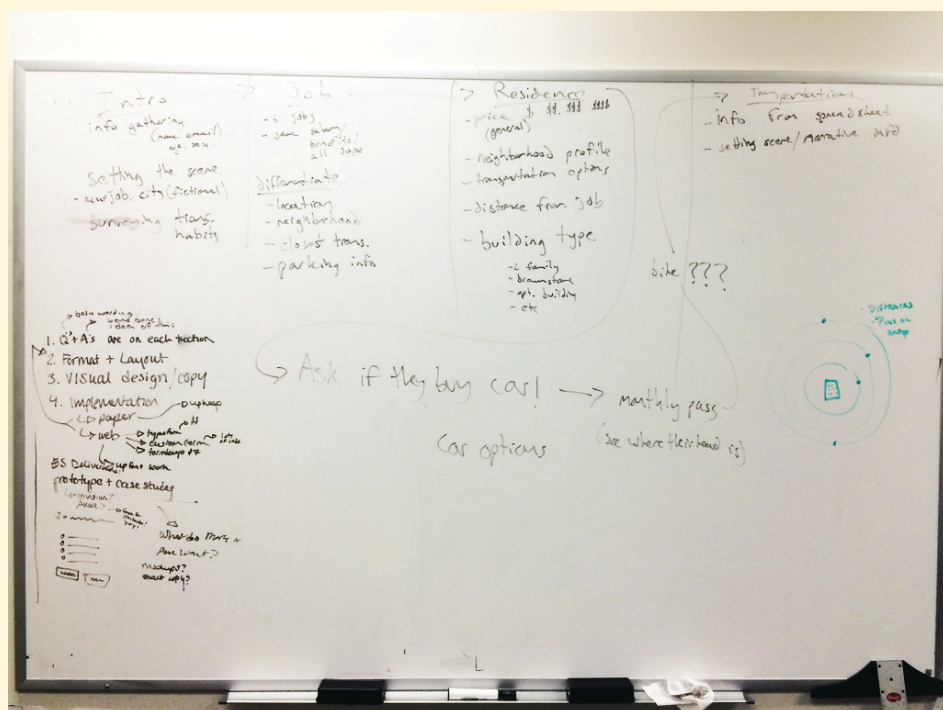
Professor Ricci mentioned a new campaign that was having much more success. This campaign targets specific cities and highlights a decrease in smoking amongst youths in

the area, saying they were performing better than other cities. Highlighting this existing good behavior fueled an even higher decrease in smoking.

Together, we decided that this method of positive reinforcement was the best approach to this problem. If we identify existing environmentally friendly behavior, even if just small everyday actions, we can affirm and reward this behavior in some way. This type of positive reinforcement falls in line with the theories of operant conditioning. B.F. Skinner, the “father” of operant conditioning, even talks about this type of problem in his article “Why Are We Not Acting To Save The World.”

DEVELOPING A PSYCHOLOGY EXPERIMENT

Once we had a more effective approach, we decided to begin ideating possibilities for what our “evaluation” would be. After lots of conversation, sticky noting and white boarding, we began forming a plan around a simulated scenario in which a participant would make transportation decisions, along with an environmental assessment. With this new plan, we assume that the user is echoing potential decisions they would make in real life.



We decided to create an experiment where participants run through a simulated scenario, as opposed to a real life scenario, for a few reasons. First, running an experiment in the real world means we would have to collect transportation data on all of our participants. We could either find a way to track them, or they could self document their daily transportation behaviors.

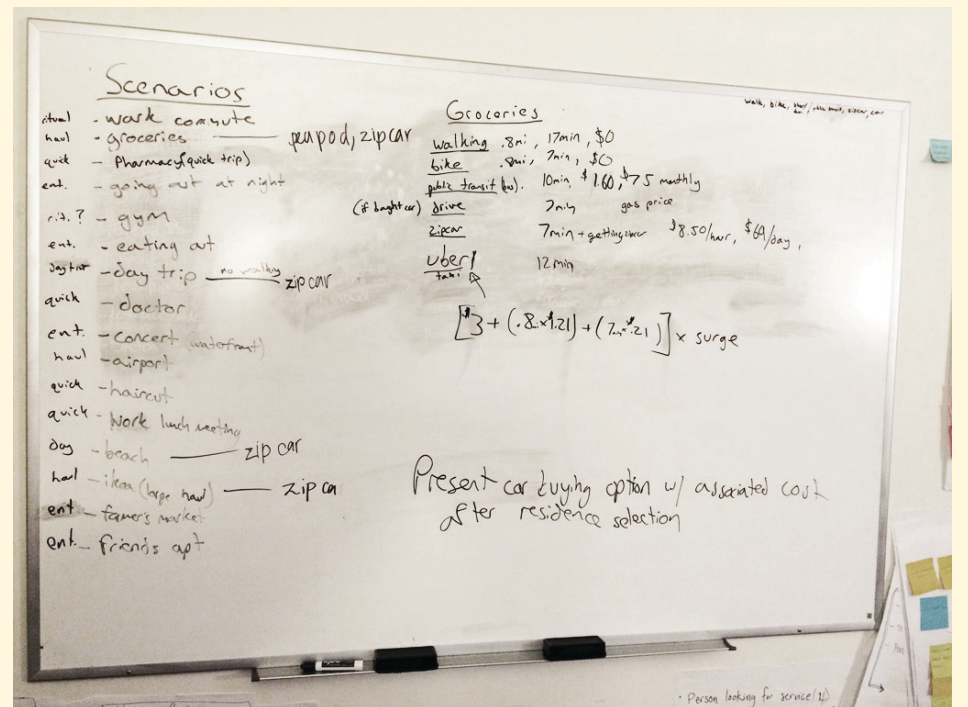
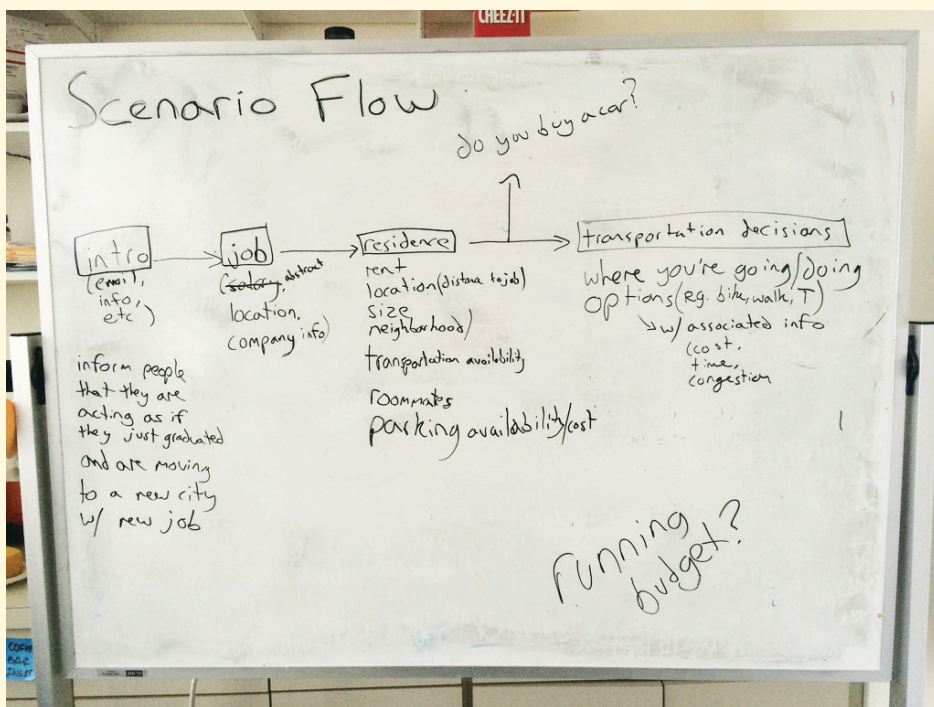
Both of these are problematic. Tracking people create very large logistical and technical barriers. Setting up the technology to track people’s transportation is not an easy feat. Self documenting this type of behavior could be unreliable because there is a normative social influence. They know it is perceived as better if they are choosing more environmentally friendly transportation options, so they may lie through their self-documentation. The second reason for running a simulated scenario is that it

allows us to control all of the variables. In the real world, we cannot control what scenarios a participant will be faced with, and what their options will be, but we can control that in a simulated environment. This will allow us to more easily make claims about the results of our experiment.

OUR FINAL HYPOTHESIS

Educating a user about their transportation habits in the form of continuous positive reinforcement of existing, environmentally friendly behavior will motivate them to make better transportation decisions

On the recommendation of Professor Ricci, we focused on college students, particularly those who will graduate in the next year or two. This is because forming new behaviors can be easier than changing existing behavior, and when college students graduate they are generally put into a new situation where they must make new transportation decision, like commuting to work everyday. Also, as college students ourselves, our access to college students vast. The scenario we planned out echoes the major decisions that any new college graduate faces in life—where to work and live—and then transitions into quicker situational questions about transportation to measure how a participant would behave in a given situation.



The experiment will consist of an experimental group and a control group. Both groups will first run through our scenario. Next, over the next few months, we will provide the experimental group with bi-weekly surveys to fill out about their transportation behavior since the last survey. Then we will provide, on a bi-weekly schedule alternate to the surveys, positive reinforcement of the environmentally friendly behavior identified in the last survey.

The survey will ask the participant to estimate how much time they have spent on various types of transportation in the past two weeks. Our positive feedback will find positive behavior in this and reinforce it. A sample feedback would look something like - "Awesome job! Since we last talked you've spent about 6 hours on the train and barely any in a taxi. That's way more than alot of other students your age. Because of

all these great choices you’re in the bottom 25% for carbon emission amongst students your age. Keep up the good work!” The statistics which we provide can be calculated against other participants, or they can simply be fake reinforcers meant to support our reinforcement.

The control group will receive no feedback from us over this period. Finally, we will have both groups run through our scenario again. We will then determine whether or not there was any change in behavior of either group. We will do this by rating their decisions based on the carbon emitted by the type of transportation they chose. Our hypothesis claims that the experimental group should have an increase in environmentally friendly behavior greater than the control group.

DESIGNING THE SCENARIO

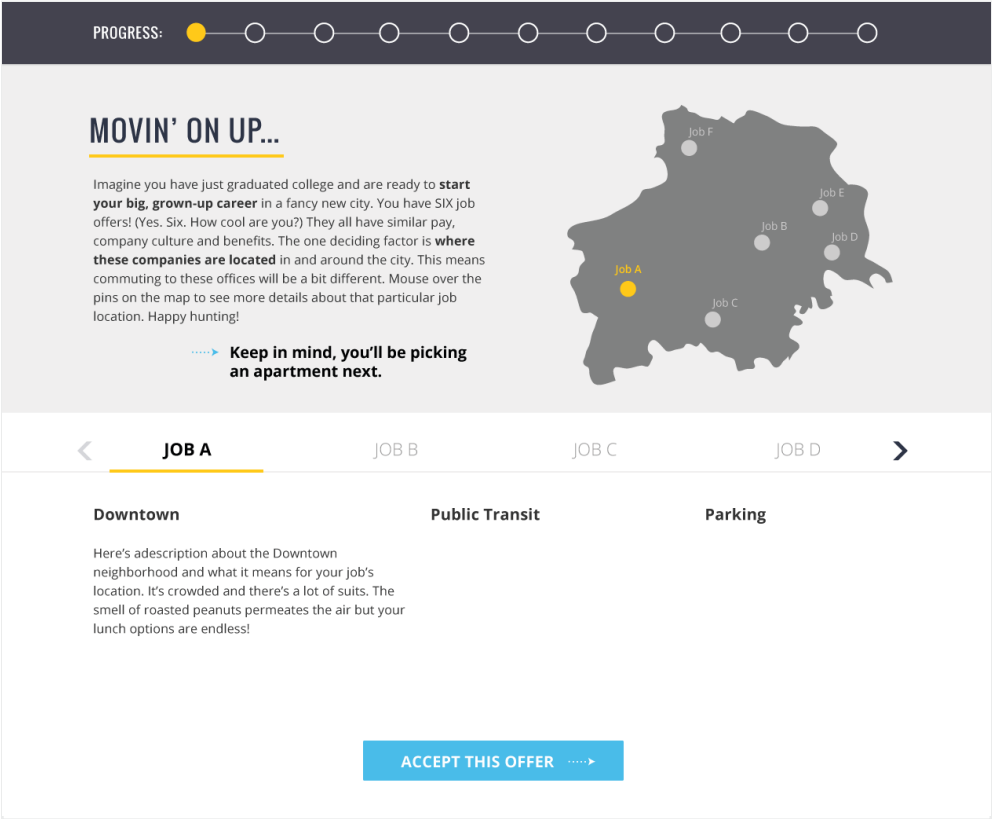
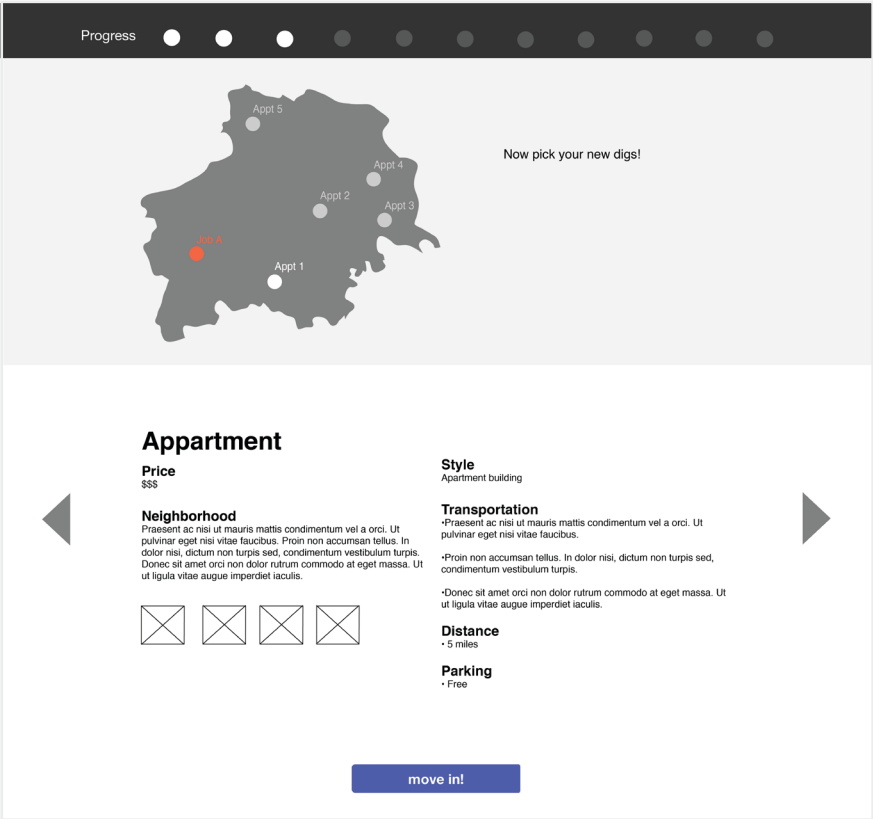
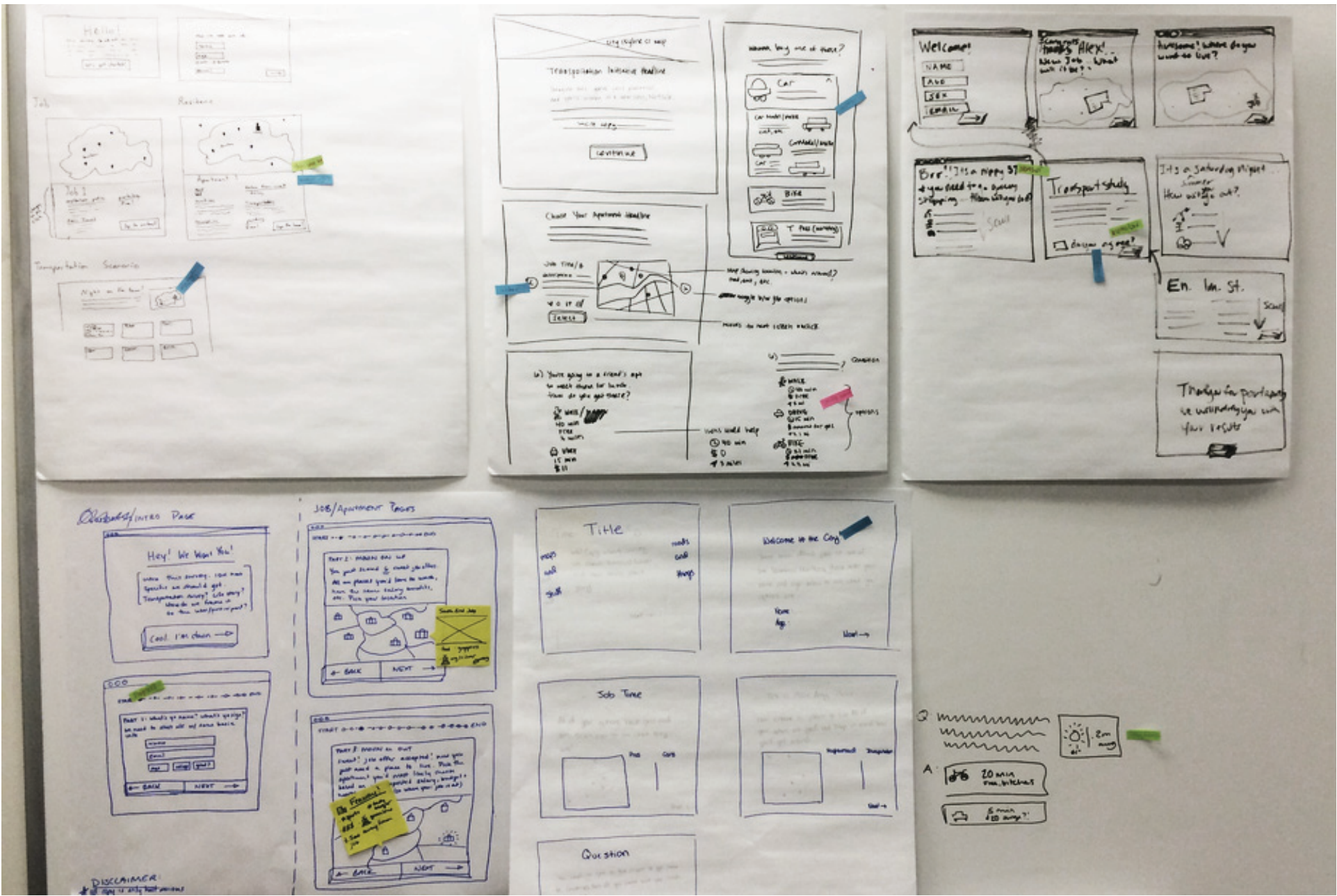
In our hypothetical choose-your-own-adventure scenario, we start by giving the participant a choice of job opportunities (where the only differences lie in the location), followed by a choice of living options relative to the chosen job. We attempted to recreate the options that would be available in a real life scenario: certain neighborhoods are more expensive, options get cheaper as you get away from downtown, and there are options close distance, medium distance, and long distance from work.

After that, the participant is presented with around 15 different transportation situations, such as work commute, going out to dinner, grocery shopping, or going to the airport. In each situation, the participant is shown all of the possible transit options (walking, biking, train/bus, uber/taxi, driving) along with the cost of transit and time of travel.

1			Walking			Bike			Public Transit		
2			Minutes	Cost	Distance	Minutes	Cost	Distance	Minutes	Cost	Route info
18	GREEN APARTMENTS (MEDIUM DISTANCE)										
19	Xtuna	Groceries	4min	0	0.2mi	1min	0	N/A too close	-	-	-
20		Pharmacy	7min	0	0.3mi	2min	0	N/A too close	-	-	-
21	The Squealing Pig	Going out	23min	0	1.5mi	8min	0	1.5mi	17min	\$1.60	0.3mi Walk > 39 bus (8 stops) > 0.1mi Walk
22	Mike's Fitness	Gym	12min	0	1.0mi	5min	0	1.4mi	11min	\$2.10	0.4mi Walk > Orange Line (1 stop) > 0.1mi Walk
23	Citizen	Eating out	41min	0	2.5mi	15min	0	2.5mi	37min	\$2.10	0.4mi Walk > Orange Line (2 stops) > 8 bus (11 stops) > 0.1mi Walk
24	Bearskin Neck	Day trip	13hrs 13min	0	43.7mi	4hrs 1min	0	43.7mi	2hr 14min	\$12.60	0.4mi Walk > Orange Line (10 stops) > Commuter Rail to
25		Doctor	27min	0	1.4mi	9min	0	1.4mi	17min	\$1.60	0.3mi Walk > 39 bus (7 stops) > 0.1mi Walk
26	Zach	Concert	45min	0	2.7mi	16min	0		32min	2.1	.4mi walk -> orange line -> .9mile walk
27		Airport	1h58min	0	6.6mi	46min	0		54min	2.1	.4mi walk -> orange line -> blue line -> logan terminal bus

Our team started off by jumping into a content strategy and execution sprint. For the introductory copy that prefaced each section of the quiz, we went for a chatty, informal feel with our college-aged audience in mind. To fill in the transportation scenario options, we split up the work by apartment and work commute and used Google Maps to accurately fill in cost, time, route, and distance information for each mode of transit. Using an organized content inventory proved to be useful in making sure everything got done.

While we continued to refine content, we went full-speed ahead on interaction and visual design. To begin the process, our entire team participated in a rapid sketching session. We pinned up our sketches and discussed which components we thought worked best (questions, answers, job/apartment map, progress bar, etc.). Once we were all on the same page, two members of the team took over and moved into high-fidelity wireframe designs and eventually full visual design. After a series of edits, we finally felt that the design was functional and communicative.



FINAL THOUGHTS

Though it proved tough to achieve, our goal was to create an experiment to influence people to form sustainable transportation habits through informal education about the environment. In just four short months, our team launched a full research initiative on sustainable transportation, environmental effects, and the psychology of motivation, and concepted and designed a data-driven experiment. We fearlessly sprinted down a path that, while not always clear, was full of valuable lessons along the way:

1 *Research, research, research.*

This cannot be stressed enough. When we began this project, we didn't expect to do research for a solid three months, but it was certainly but it was certainly vital to creating a foundation and direction before jumping into the design phase.

2 *Occasionally, someone's already done the work for you.*

In such a research-heavy project, it can often be tempting to survey all the users you can find and use your own data. However, if someone else has done the same research, chances are it's somewhere online. Back up your decisions with real data so you can focus on the thinking and ideation part of the process (especially if you are crunched for time).

3 *Don't get too attached to ideas.*

Although your early ideas can be decent, they often become invalid as new information is gathered throughout a design thinking project. It is incredibly important to constantly question your ideas through testing and research. This allows for you to ultimately arrive at the best conclusion.

HELLO & WELCOME!

We've built a simulation that will take you through the process of moving to a new city, finding an apartment and experiencing daily life. We want it to be as realistic as possible and that's where you come in! We need real answers from real people. Thank you in advance for participating in this four hour survey.

Just kidding.

It should only take about **30 minutes** (phew!). Your responses will help us analyse trends in young millennials. After you finish the game you'll get a **couple emails** from us over the next three months with super short follow up surveys. For every extra survey you fill out you'll get a **\$5 gift card**.

HELP US HELP YOU

-> Complete our simulation
-> Keep an eye on your inbox
-> Take three more short surveys
-> **GET PAID \$\$\$**

LET'S ROLL>