

Carbon Usage of Commuters

Transportation and Mobility | Team 1

Our Team



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Needfinding Methodology

Our Interviewees

Who? People who commute to work

Why? Interested in their environmental consciousness and carbon usage

How? Connections on LinkedIn, work connections of friends

Where? Over Zoom, phone/FaceTime, in-person

Guiding Questions — **What** Did We Ask?

Tell me about your commute.

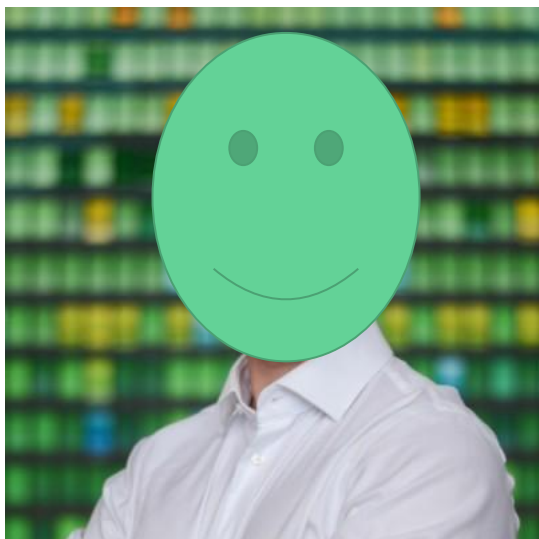
Tell me about a good or bad experience you've had during a commute.

What do you think of sustainability?

What do you think of your own carbon footprint?

What would make you care more about your carbon footprint?

Interview Results



Mike (24)

- *Associate at Private Equity Firm in Palo Alto*
- *Lives in SF*
- *Drives a gasoline car*
- *40 min phone interview*

“Our culture doesn’t really acknowledge carbon usage.”

Insight

There is no clear education around carbon usage in transport, and communal pressures don’t dissuade usage.

Need: A better way to measure and evaluate carbon usage.



Peter (24)

- *Analyst at Hedge Fund in Palo Alto*
- *Lives in Mountain View*
- *Drives an EV*
- *25 min phone Interview*

“If we are living in shared community, everyone should share resources and be aware of the costs.”

Insight

People care about their own consumption of a shared resource.

Need: Measure individual contribution to a shared waste of resources.



James (23)

- *Engineer at Apple*
- *Lives in SF*
- *Commutes via shuttle*
- *20 min Zoom interview*

“Having metrics would make me more aware of my habits and their impact from an emission standpoint.”

Insight

There is a general lack of awareness of the environmental impact of everyday activities.

Need: An accessible way of knowing the carbon usage metrics of certain activities.



Winter (22)

- *Medical Research Assistant*
- *Lives in Mountain View*
- *Drives a Prius*
- *20 min Zoom interview*

“I think about sustainability in terms of food waste, recycling, and separating trash... but commuting not so much.”

Insight

Sustainability is not easily thought of in terms of commuting and transportation.

Need: More clarity on how transportation and daily commutes impact sustainability.



Ben (28)

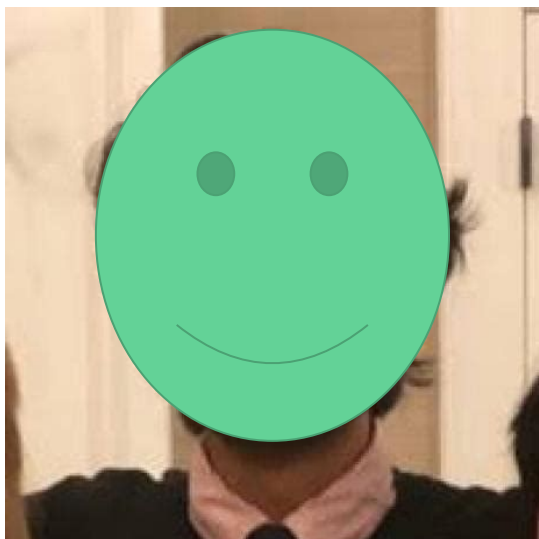
- *Social Security Office in Richmond, CA*
- *Sacramento*
- *Train (Amtrak)*
- *30 min phone interview*

“I don’t know constantly think about my carbon usage and my carbon footprint everyday, but I know taking the train helps.”

Insight

Awareness and clarity of one’s carbon footprint can be crucial in regulating carbon use.

Need: A way to make thinking about one’s carbon footprint an easier and more consistent action throughout the day.



Martin (22)

- *Student*
- *Stanford*
- *Bike, Walk*
- *30 min in-person interview*

“I really think corporations ought to take responsibility for emissions. I don’t feel a responsibility for the emissions generated when I fly with a commercial airline”

Insight

Some folks believe corporations should bear responsibility for emissions generated by transportation.

Need: A method to hold corporations responsible for their emissions.



ECO RESORTS
— INC. —

Jessica (29)

- *Works at Eco Resorts, Inc*
- *Moran, WY*
- *Trucks, Snowmobiles, Horses*
- *30 min FaceTime interview*

“Our employees drive to and from a nearby ski resort to pick up and drop off guests every day. They drive around 200 miles per day.”

Insight

This corporation spends a significant amount of resources transporting customers to and from their property.

Need: Demonstrate commitment towards sustainability to guests.

Analysis of Findings

James

SAYS

"Metrics would make me more aware of my habits and their impact from an emission standpoint."

"I would care more about my personal carbon footprint if corporations cared more and did more."

"Being in a city like SF, it's very nice to be able to do everything by myself, with my own power."

THINKS

I would be more motivated to do better with an awareness of my emission metrics.

I want to make an impact but I worry about how little it will amount to compared to that of corporations.

I want to be able to get around anywhere without the use of a car, not just in SF.

DOES

Takes the shuttle with other employees to get to work for the most part.

Hesitated with a long pause when thinking about his own personal carbon footprint.

Frequently compares his day-to-day living experience in SF versus Texas.

FEELS

Unsure about what more to do in terms of reducing carbon or how to even do that.

Conflicted for wanting to do all that he can while knowing that individual impact is not as meaningful.

Empowered to be able to get around in SF via walking or biking without needing a car.

Best experience is 280 b/c it is scenic, open, not dodging cars

"I do a lot of little things to be more sustainable, like turning off the lights"

"Our culture doesn't really acknowledge carbon usage."

Sustainability is important.

Unaware of what to do about carbon usage.

Spends a lot of money on gas.

SAYS

THINKS

Mike

DOES

FEELS

Pays for the cheaper flight option, ambivalent of the carbon.

Lives close to the highway in SF.

Donates via corporate matching.

Considerate about the environmental impacts.

Observant towards certain carbon effects.

Sad that society doesn't do enough.

Tensions, Contradictions, Surprises

Tensions

- People are aware of tools such as the Google Flights carbon emissions calculator but do not alter decision making based on it.

Contradictions

- People want to do more from an individual standpoint despite knowing that their impact is much lower than that of large corporations.
- People care about their carbon footprint but drive poor fuel economy gasoline cars.

Surprises

- People are cognizant of small habits that help them live a more environmentally sustainable life.
- People that reverse commute between SF and Palo Alto do not carpool.

Inferences, Conclusions, Questions

Inferences

- Understanding carbon emissions doesn't make sense in absolute terms.

Conclusions

- There is both a individual and corporate desire to track emissions stemming from transportation.

Questions

- What might make people more aware of the carbon usage of their commutes?
- What type of tool would one use to track their carbon usage?

Summary

Through all of this we learned that...

- Observing carbon emissions and footprint in a relative way are important.
- Companies are more conscious of their carbon footprints and willing to spend to reduce it.
- Young people maintain environmentally sustainable habits.
- Economic decision making for individuals is not swayed by social cost of carbon.

Full Empathy Maps

"I used to think that sustainability was pretty much impossible because of how useful cars are."

"I think a lot of environmental problems come from everyone commuting everywhere."

"Being in a city like SF, it's very nice to be able to do everything by myself, with my own power."

"Living in SF, I realized I hate driving. The city was made for biking and walking around in."

"I'm trying to lower how often I drive, to take as few trips as possible, and to carpool as often as possible."

"Metrics would make me more aware of my habits and their impact from an emission standpoint."

"I don't go into the office if there's nothing I need to do there, like in the lab for example."

"I used to live in Texas, where there's basically no such thing as public transportation."

"I would care more about my personal carbon footprint if corporations cared more and did more."

"It really seems like most of our cities were built around the assumption that everyone can drive everywhere."

"Apple corporate is currently carbon neutral, and I think our outsourced factories are aiming to be by 2030."

SAYS

James

THINKS

It is unfortunate that sustainability is overlooked a lot in America.

I am generally conscious about my environmental impact but don't know it in detail.

I want to be more aware of the emission metrics of my daily actions in more detail — e.g. driving, flying, etc.

I would be more motivated to do better with an awareness of my emission metrics.

I want to make an impact but I worry about how little it will amount to compared to that of corporations.

I actively try to minimize my individual harm.

I want companies and corporations to care more and do more.

I appreciate that the company I work for, Apple, is actively working to reduce carbon.

I want to be able to get around anywhere without the use of a car, not just in SF.

Where you live and where you work are very important factors in individual environmental impact.

Frequently walks and bikes to get around in SF.

Takes the shuttle with other employees to get to work for the most part.

Stays home and works virtually when there is no need to go into the office.

DOES

FEELS

Empowered to be able to get around in SF via walking or biking without needing a car.

More optimistic than before about impact of individual contribution now that he drives less.

Sad to know that individual impact to sustainability is far outweighed by that of corporations.

Actively trying to lower how often he drives his car.

Hesitated with a long pause when thinking about his own personal carbon footprint.

Carpools with people whenever he can.

Checks the carbon dioxide emission metric when buying flights on Google.

Not as motivated to contribute further due to lack of awareness on the emission cost of day-to-day things.

Guilty for not doing as much as possible to reduce carbon and for having driven so much in the past.

Embarrassed about his past lifestyle of driving everywhere in Texas.

Aversion towards the idea of living in a place where you need to drive to get anywhere.

Leaves his personal car at his office to not use it during the week.

Frequently compares his day-to-day living experience in SF versus Texas.

Gets work done during commute time in the shuttle.

Conflicted for wanting to do all that he can while knowing that individual impact is not as meaningful.

Unsure about what more to do in terms of reducing carbon or how to even do that.

Jealous of countries where infrastructure being designed around public transportation is commonplace.

"The commute sucks"

Chose to live in a part of city that makes the commute shorter

Best experience is 280 b/c it is scenic, open, not dodging cars

If incentive structure was aligned financially, he would care about carbon

"I usually go for the cheaper option"

"Our culture doesn't really acknowledge carbon usage"

"Carbon offsets are huge for corporations."

"I don't really care about the Google flights carbon usage"

"I hate weaving through traffic"

"I do a lot of little things to be more sustainable, like turning off the lights"

"I'm glad there's dates for reaching carbon neutrality, but I don't think anyone will meet them"

SAYS

Mike

Work via Zoom 1-2 days a week.

Donates via corporate matching.

Spends a lot of money on gas.

DOES

Keeps up to date with ESG policies for his portfolio companies.

Lives close to the highway in SF.

Drives a LOT.

Turns off the lights when he is not home.

Pays for the cheaper flight option, ambivalent of the carbon.

Flies a lot for personal and professional reasons.

Watches his water usage.

Turns off the AC when is not home for extended periods of time.

Sustainability is important

Being actionable is important

Society isn't structured to sway away from carbon usage

Spends a lot of money on gas

Decision to think about carbon comes down to consumer

Traffic matters in his commute

Citibank had a great carbon neutrality program

Company does a lot of stuff for communities

Unaware of what to do about carbon usage

Carbon offsets are a good way for corporations to make commitments

Corporate charitable matching is a great benefit

THINKS

Responsible enough for carbon usage

Sad that society doesn't do enough

Ambivalent towards environmental costs of flying

Determined to shorten his commute.

Annoyed by the amount he has to drive.

Considerate about his environmental impacts.

Generous about his company's matching policy

Analytical about choosing where he lives.

Thoughtful about his gas consumption.

Observant towards certain carbon effects.

Worried about carbon effect on our environment.

FEELS

"I work for Social Security at their Richmond offices"

"Instead of using my car to commute to work, I take the Amtrak (train)"

"It takes an hour and a half to get from Sacramento to Richmond"

"I think I would care more about sustainability if there were easier ways to contribute"

"I have never heard of the term carbon offsets"

"There's nothing at the Social Security office that relates to promoting sustainability"

"I'd rather take the train and relax than need to drive to Richmond everyday"

"I don't think too much about sustainability, I just know it is good for the environment"

"I think that taking the train reduces my carbon footprint compared to driving everyday"

"I don't know too much about what a carbon footprint is"

"I spend about 3 hours on the train each day"

SAYS

Ben

Takes the train to work

Lives in Sacramento and commutes to Richmond for work

Works for Social Security

DOES

Does not care a great deal about sustainability, knows it is important

Does not know anything about carbon offsets

Likes taking the train because he can relax once on it

Does not like how the train can be delayed

Spends \$300/month on gas

Does not like that the train can be expensive when taken multiple times

Family recycles at home, does so at work as well

Separates trash as much as possible

Believes that taking the train reduces his carbon footprint compared to driving

Does not think too much about sustainability in daily life

Does not think about sustainability related to transportation

Thinks he can contribute more to sustainability if there were easier/better ways to

Thinks he himself does not make a big impact of sustainability efforts

Does not think about his carbon footprint on the daily

Thinks that taking the train is a better option compared to being stuck in traffic

Thinks that recycling at home is one of the main ways he contributes to sustainability

Does not think recycling or separating trash is the only way

Does not know how much he impacts the environment with taking the train to work

Does not know that carbon offsets can be bought by companies

THINKS

Enjoys taking the train to work

Feels that he can definitely do more to contribute to sustainability

Does not enjoy paying too much for gas

Does not feel like he can contribute much to sustainability by himself

Feels like there are not easy ways to think about sustainability when it comes to commuting

Feels that commuting to work is something no one can avoid, so no one thinks about the impact of it

Feels like global warming is definitely becoming a more prominent issue

Feels that having a better understanding of carbon offsets can help him act on it

Does not feel that taking the train and recycling is doing enough

Feels like he should do more himself to be more educated on sustainability issues

Feels open to learning more

FEELS

SAYS

THINKS

DOES

FEELS

Eco Resorts, LLC

"The National Parks are a public asset that bring us business"

"NPS and the USDA reward our sustainability efforts"

"I am proud to tell people that our corporation is a steward of the environment"

"Having hydroelectric power makes being sustainable much easier"

We need to preserve our National Parks and forests

The government is an important part of sustainability efforts

How can we save money on energy costs

How should we present our sustainability efforts so people are aware of and happy with them

"One of our employees commutes over 100 miles every day"

"Gas is expensive, even though we're pulling it straight out of the ground here"

"It will be a long time before electric vehicles can deal with the cold here"

"Electric pickups are great for getting around the suburbs, but not for freezing, isolated sites"

It is valuable to quantify carbon emissions and other impacts on the environment

Eco Resorts will continue using gas vehicles for a long time

Being preemptive and prudent is essential to staying in business

Guests appreciate the efforts we make to lower our environmental impact

"Snowstorms can cause a lot of car accidents, especially with so many tourists on the road"

"We spend over \$100k on car insurance a year"

"The cost of buying carbon offsets could be passed onto NPS/USDA"

Corporations bear a responsibility to the environment, but the Gov. should lead the charge

Electric vehicles are the future

Appliances on power grid are more reliable than gas appliances

Writes about sustainability in contract bids

Communicates with USDA and NPS about future sustainability goals and programs

Talks to guests about sustainability efforts on property

Encouraged by NPS and the USDA, as they both reward sustainability

Proud to tell people about the corporations sustainability efforts

Enabled to increase the sustainability of the corporation

Replaces older, less energy efficient vehicles with new ones

Researches the impact of vehicle models on the environment

Researches the safety ratings of new cars before buying

Monitors drought conditions and how they might affect hydroelectric power supply

Confused about the cost of gasoline

Competitive about leveraging sustainability to win contracts

Excited about EV usage in less harsh conditions

Realistic about EV usage in cold temperatures and isolated areas

Pays for automobile insurance

Converts gas heaters to electric

Monitors the weather and how it could affect road conditions

Queries guests for feedback on their perception of resorts sustainability efforts

Troubled about car accidents and road conditions

Patriotic about the U.S.'s National Parks

Intrigued by the prospect of collaborating with NPS/USDA on carbon offsets

Concerned about the wellbeing of commuting employee