



SUSTAINING MULTI-MODAL TRAVEL BEHAVIORS

EXAMINING THE IMPACT OF COVID-19 PANDEMIC

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Presentation Outline

1. Background

2. Research Questions

3. Research Design and Methodology

4. Findings

5. Discussions

Research Background

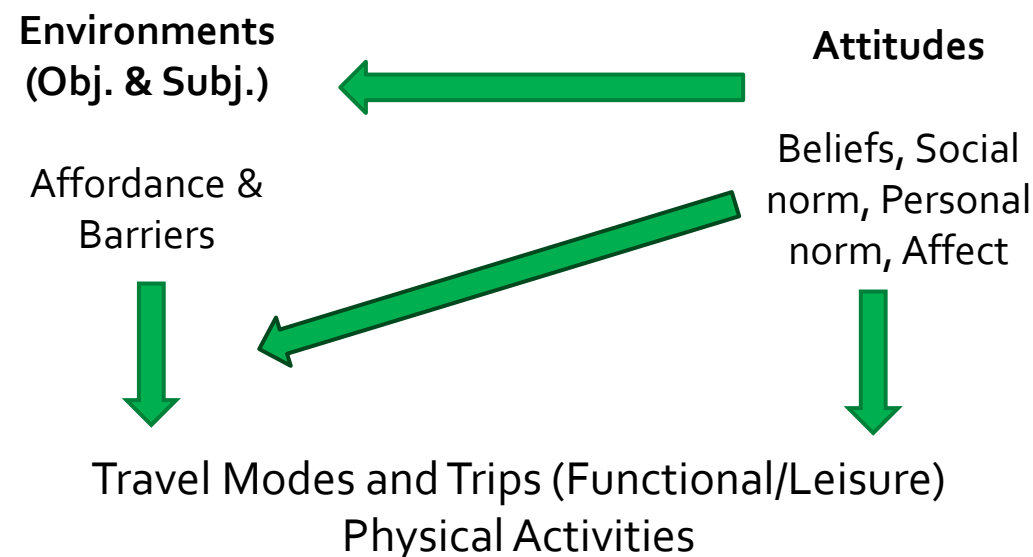
Travel Behavior – Environments – Attitudes

• Environments – Travel Behaviors

- Objective built environmental characteristics (e.g., densities, land use mix, etc) show association with travel behaviors.
- Subjective built environmental characteristics (e.g., perceptions of proximity) appear to be more important than objective characteristics.
- Social environment (e.g., social acceptance, safety, etc) often play a role.

• Attitudes – Environments – Travel Behaviors

- Attitudes toward a travel behavior shape one's tendency of behavioral adoption.
- Attitudes leads to self-selection (e.g., via residential location choice) of environment, which then enables pre-disposed behavior tendencies.
- Attitudes modify environmental characteristics' impact on travel behaviors, making people more or less willing to negotiate the environment.

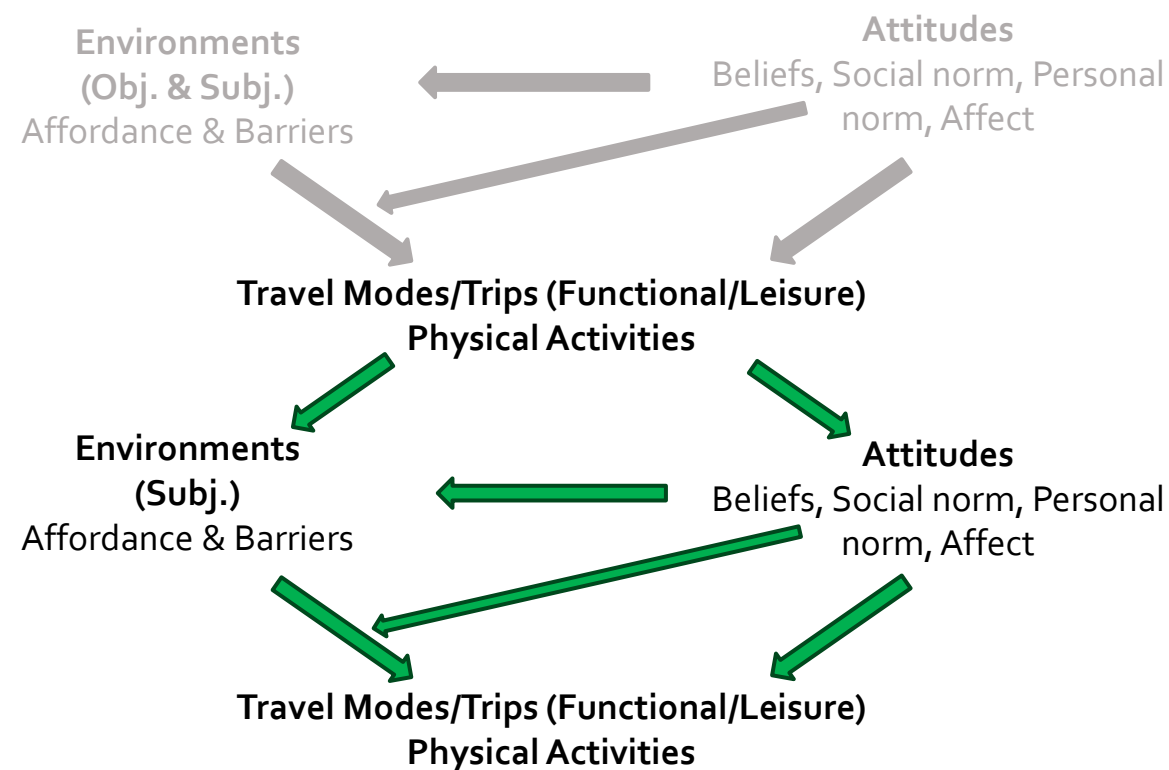


Research Background

Travel Behavior – Environments – Attitudes

Travel Behaviors – Attitudes – Environments

- Travel behavior changes lead to changes in attitudes.
- Travel behavior changes lead to changes in environmental perception.
- Changes in attitudes and subjective environments then lead to new behaviors.



Research Background

The Impact of COVID-19 on Travel Behaviors

1. Automobile driving

- Significant reduction (40%-50%) in VMT during early months of the pandemic.
- Driving activity recovered as restrictions eased and business reopened.
- Individual driving increased from people shifting from public transit use.
- Overall, driving activity fluctuated in response to changing infection rates, government mandates, and public behavior.

2. Public Transit Use

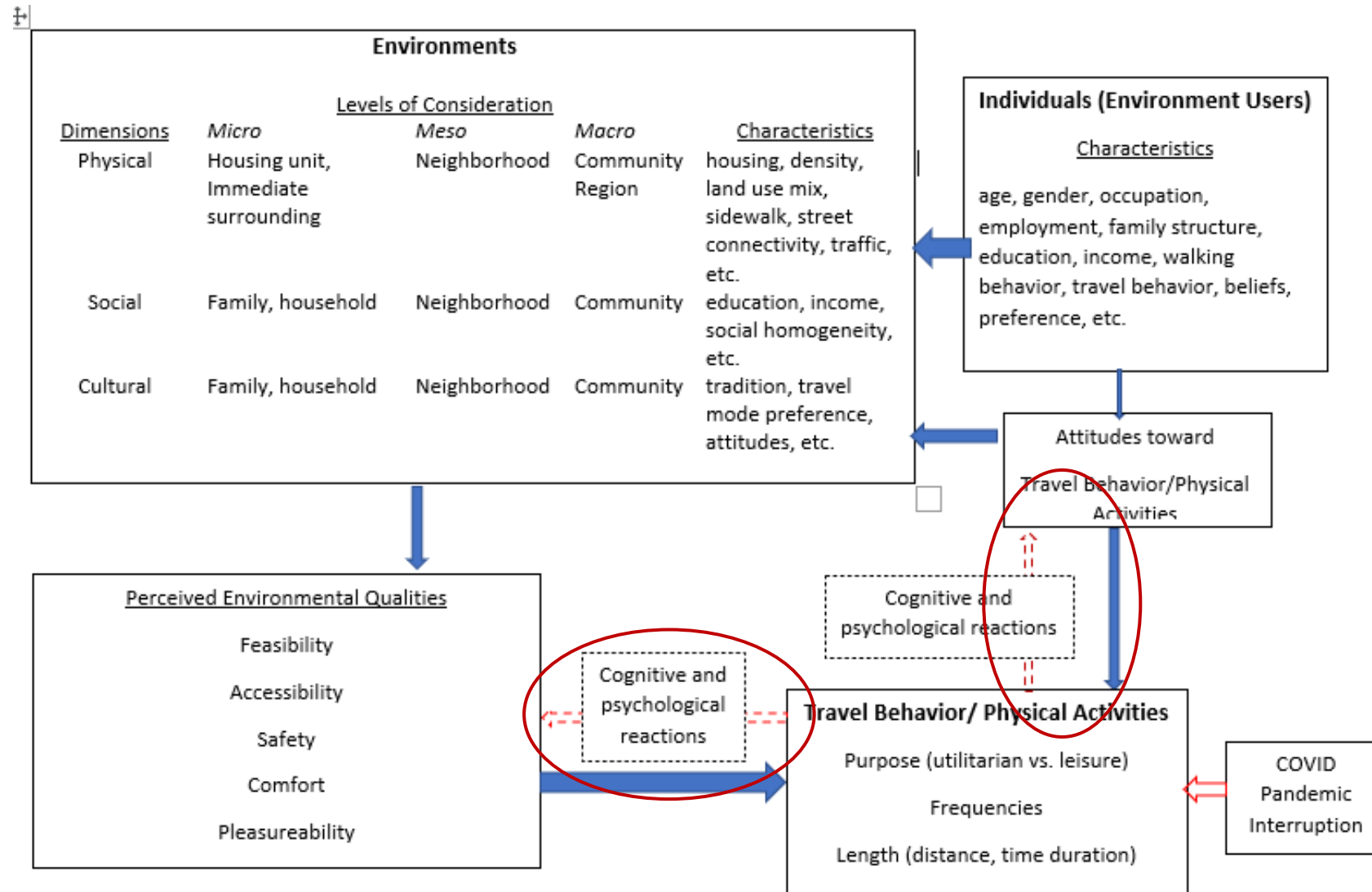
- Steep decline (more than 70%) in ridership during the early months of the pandemic, particularly during commuting times.
- Reduced transit services and declining ridership affected each other.
- Gradual and slow recovery of public transit usage, .

3. Walking/Biking

- Early reduction in walking quickly recovered, especially walking for local errands and recreational purposes.
- Surge in bicycle usage for commuting and recreational purposes.
- Expanded pedestrian spaces, safety concerns, and well-being concerns affected walking/biking in different ways.

Are Pandemic-Induced Travel Behavior Changes Here to Stay?

Conceptualizing COVID-Induced Travel Behavior Changes



Research Questions

1. Did the changes in travel behaviors induced by COVID-19 affect how people perceive their neighborhood environments in physical and social terms?
2. Did the changes in travel behaviors induced by COVID-19 affect people's attitudes toward travel modes, physical activities, and relevant policies?
3. Will the changes in travel modes continue after the pandemic risk subsides? What factors – attitudinal and environmental – help explain the future sustainable transportation?



Research Design and Methodology

1. Study Area – Eugene-Springfield MSA, OR
2. Longitudinal Research Design
3. Mixed methods – surveys and interviews



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Phase 1: Interdisciplinary Collaboration

- Yizhao Yang, PhD, PPPM
- Rebecca Lewis, PhD, PPPM
- Linda Price, PhD, Business
- Sara Hodges, PhD, Psychology
- Joshua Skov, Business
- Shane Rhodes, City of Eugene
- Kivalina Grove, PhD Candidate, Marketing
- Murat Kezer, PhD Student, Psychology
- Clare Haley, Master of Community and Regional Planning Candidate



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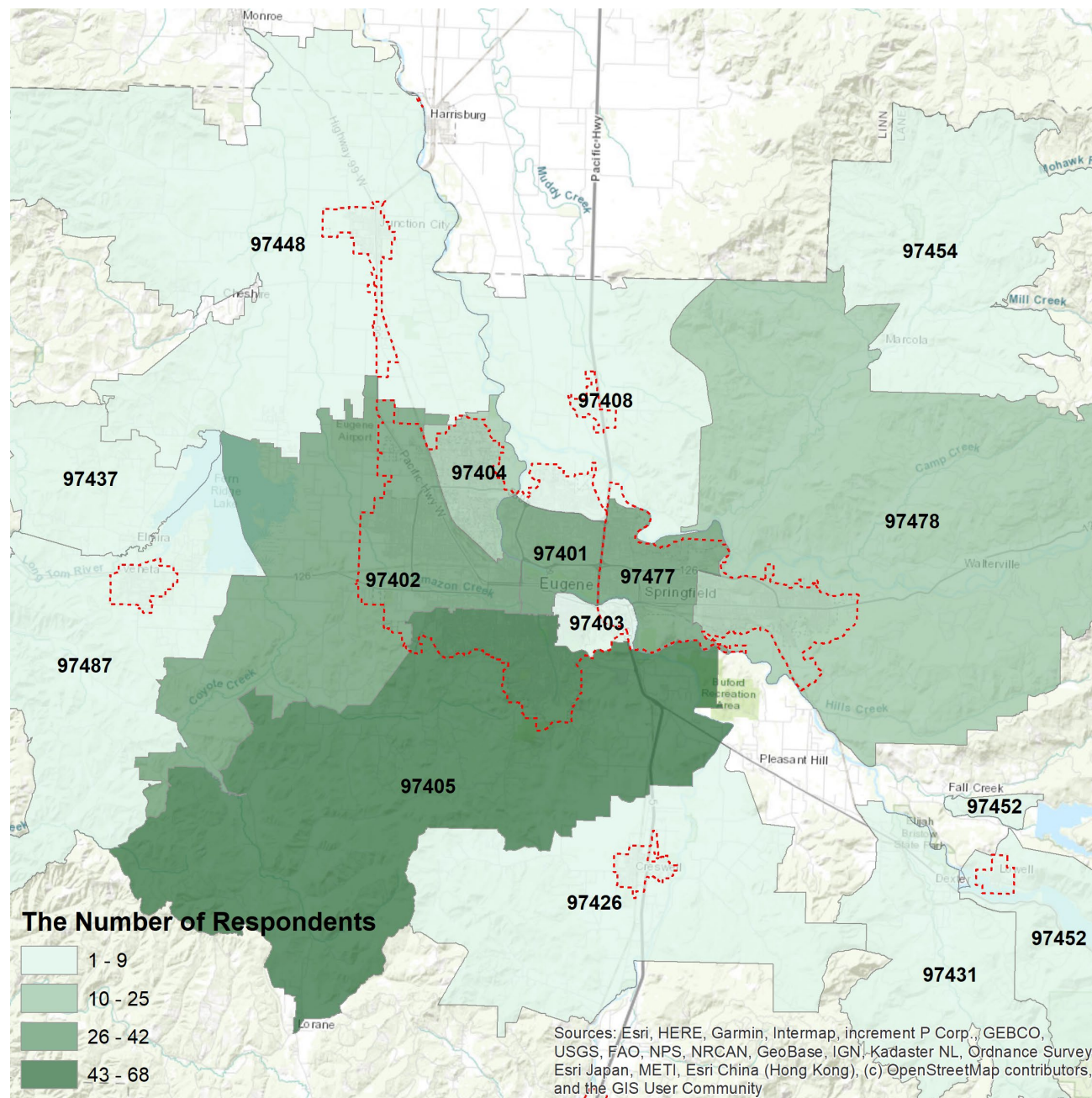
Phase 2: Technical Advisory Committee

- City of Springfield: Emma Newman
- Lane Council of Governments: Ellen Currier
- City of Eugene: Shane Rhodes
- University of Oregon Transportation Services: Josh Kashinsky and David Reesor
- Better Eugene Springfield Transportation: Rob Zako
- Lane Transit District: Andrew Martin
- Linda Price, PhD, Business
- Sara Hodges, PhD, Psychology
- Joshua Skov, Business



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Study Area – Eugene-Springfield MSA, OR





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Methodology - Surveys

Target population: adults (18 and over) living in Eugene-Springfield from March 2020 through July 2022.

First wave:

- Data collection time: June – July 2020
- Survey content: respondents' walking behavior pre-COVID19 and during the shelter-in-place period (March 16 – May 14, 2020); attitudes toward various behaviors and public policies.
- Recruitment: listservs, social media, paid advertisement, etc
- Responses: 684

Second wave:

- Data collection time: June – July 2022
- Survey content: respondents' walking behavior during the entire COVID-19 Emergency Period in Oregon (March 8, 2020 – April 4, 2022); anticipated behavior change as COVID-19 threat recedes; reactions to the changes; attitudes toward various behaviors and public policies.
- 384 respondents from the first-wave survey were recruited via direct emails → 186 responses (156 non-moving respondents)
- A broader call to the general population via Facebook and advertisements; A follow-up recruitment on target groups with low response rates (Under 24, male, high school education, and Spanish speaking) → 125 responses



Methodology – Focus Groups & Interviews

First wave:

Post-survey (April & May 2020): 40 participants in 5 focus groups; each focus group focused on one type of transportation means (i.e., walking, biking, public transit, driving only, and multi-modal)

Second wave:

Pre-survey (April & May 2022): 8 individual interviews.

Post – survey (July 2023): 24 participants in 3 focus groups.



First Wave Findings

Survey

- Travel behavior changed – acquiring goods, shifting exercise, desirable spaces for activity
- Infrastructure and urban form – mixed use & built environment important to support biking and walking; emphasis on local area and walking without destination
- Modal: fear about transit; more tripchaining; dislike of sharing & crowded spaces
- Policy: desire to work from home; support environmental policy
- Demographics: education influences behavior and attitudes; gender & race influences behavior

Focus Groups and Interviews

- Strategic planning around trip chaining and driving
- Affordances, barriers and shifts around each mode of transportation
- Returning to previous behaviors and changing some behaviors; trying new things



Findings: Affective reactions to different levels of travel behavior changes

Driving

- Significant decrease → favorable reaction (25%)
- Significant increase → unfavorable reaction (22%)

Public Transit

- Significant decrease → favorable reaction (29%)

Walking/Biking/PA

- Significant decrease → unfavorable reaction (60%)
- Significant increase → favorable reaction (76%)

	<i>I disliked the changes very much</i>	<i>I disliked the changes somewhat</i>	<i>Neutral/no opinion</i>	<i>I liked the changes somewhat</i>	<i>I liked the changes very much</i>	<i>N/A (no changes or never had this behavior)</i>
Driving						
decrease significantly (n=151)	17.83%	19.38%	19.38%	17.83%	25.58%	0.00%
decrease somewhat (n=41)	8.57%	11.43%	45.71%	22.86%	8.57%	2.86%
become about the same (n=36)	12.90%	0.00%	67.74%	6.45%	0.00%	12.90%
increase somewhat (n=12)	10.00%	20.00%	70.00%	0.00%	0.00%	0.00%
increase significantly (n=10)	22.22%	22.22%	22.22%	11.11%	11.11%	11.11%
Transit Use						
decrease significantly (n=168)	29.21%	25.84%	32.58%	1.12%	7.87%	3.37%
decrease somewhat (n=30)	12.50%	25.00%	56.25%	0.00%	0.00%	6.25%
become about the same (n=47)	0.00%	8.00%	72.00%	0.00%	4.00%	16.00%
increase somewhat (n=2)	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%
increase significantly (n=2)	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
Physical Activities						
decrease significantly (n=55)	60.00%	28.00%	10.00%	0.00%	0.00%	2.00%
decrease somewhat (n=64)	32.76%	46.55%	17.24%	1.72%	1.72%	0.00%
become about the same (n=65)	5.00%	15.00%	51.67%	1.67%	1.67%	25.00%
increase somewhat (n=33)	0.00%	0.00%	13.33%	60.00%	26.67%	0.00%
increase significantly (n=33)	3.33%	0.00%	3.33%	16.67%	76.67%	0.00%

Findings: travel behavior changes correlate with changes in environmental perceptions

- Changes in one's driving and transit usage don't seem to correlate with neighborhood observations and experiences.
- Increases in one's physical activities:
 - "saw more people in the neighborhood"
 - "got to know more people"
 - "found more interesting places"
 - "became more engaged"

1. Neighborhood Observations and Experiences (Mean Agreement Level)

		<i>saw more people</i>	<i>got to know more people</i>	<i>found more interesting places</i>	<i>became more engaged</i>
	<i>Mean (N=202)</i>	3.30	3.00	2.88	2.41
Driving					
decrease significantly	N=123	3.35	3.02	2.9	2.38
decrease somewhat	N=33	3.36	2.88	2.76	2.52
become about the same	N=28	3.21	2.82	2.89	2.46
increase somewhat	N=9	3.11	3.56	3.11	2.33
increase significantly	N=9	2.67	2.44	2.44	2.11
Transit Use					
decrease significantly	N=85	3.27	2.98	2.93	2.42
decrease somewhat	N=14	3.71	3.43	3.21	3.14
become about the same	N=25	3.32	2.92	3	2.6
increase somewhat	N=1	3	3	1	1
increase significantly	N=1	4	3	2	1
Physical Activities					
decrease significantly	N=47	2.85	2.21	1.96	1.6
decrease somewhat	N=56	3.21	3.13***	2.91***	2.45***
become about the same	N=58	3.14	2.95***	2.79***	2.59***
increase somewhat	N=29	4.07***	3.62***	3.69***	3***
increase significantly	N=27	3.74***	3.56***	3.78***	2.78***

Mean comparison by behavior change category, reference group = "decrease significantly": ***(p<0.001), ** (p<0.05), *(p<0.1)

Findings: Changes in Attitudes and Beliefs

Over the two-year period, the same group of respondents have shown statistically significant changes in their attitudes toward and beliefs in some environmental policies.

	<i>Mean</i>	<i>Std. Deviation</i>	<i>Std. Error Mean</i>	95% Confidence Interval of the Difference		<i>P (2-sided)</i>
				<i>Lower</i>	<i>Upper</i>	
Driving less is good for the environment	1.23	1.17	0.11	1.02	1.44	<.001
Government encourages more EVs	0.45	1.09	0.10	0.26	0.65	<.001
Government responsibility to reduce driving	0.32	0.79	0.07	0.19	0.47	<.001
Government encourages more e-bikes	-0.85	1.17	0.11	-1.06	-0.64	<.001
My community cares more about environment	-0.41	1.62	0.15	-0.70	-0.12	0.01
Individual responsibility to reduce driving	-0.17	1.09	0.10	-0.37	0.02	0.08
Air quality improved because of stay-at-home	-0.01	0.86	0.08	-0.17	0.14	0.86
support policies reducing driving	0.09	1.75	0.16	-0.22	0.41	0.56
<i>N = 120</i>						



Findings: Changes in Attitudes and Beliefs Correlate with Environmental Characteristics

One's neighborhood characteristics (e.g., higher walkability) appear to strengthen certain attitudes/beliefs: **responsibility to reduce driving and community norm.**

	<i>Government responsibility to reduce driving</i>	<i>Individual responsibility to reduce driving</i>	<i>My community cares more about environment</i>	<i>Driving less is good for the environment</i>	<i>Air quality improved because of stay-at-home</i>	<i>Government encourages more EVs</i>	<i>Government encourages more e-bikes</i>
Walk score	-0.043	.404**	.572**	.389**	-.740**	-.441**	-.592**
Population density	.289**	.475**	.668**	.428**	-.621**	-.355**	-.460**
Open space accessibility	.306**	0.095	.530**	0.184	-.416**	-0.161	-.269*
Grocery store accessibility	.211*	.539**	.400**	0.072	-.421**	-0.167	-0.157
Perceived walkability	-0.035	0.109	.398**	0.128	-.433**	-.414**	-.433**
N=120							



Findings: Factors predicting increase in future travel behaviors



Individual driving:

Driving more in the immediate post-COVID Emergency (+).

Perceive greater COVID threat in the future (-)

More parks within half mile from residence (-)



Transit use:

Increase transit use in the immediate post-COVID Emergency (+)

Use transit more than preferred (-)



Walking/Biking

Increase in neighborhood walking during COVID (+)

Perceive greater COVID threat in the future (-)

In the age group of 36 – 55 (-)

Non-white (+)

Summary

Changes in walking behavior can affect people's perceptions and attitudes, potentially influencing their future decision to walk for transportation. The extent of these effects, however, appears to be dependent on the magnitude of the change experienced.

As society emerges from the pandemic, people are resuming their travel and anticipating increased activity across all modes, including driving, transit, and walking/biking. This may contribute to the perception that individuals lack control over their transportation choices and result in a decline in the belief that reducing driving is solely an individual responsibility.

While environmental factors have a relatively weak impact on walking behaviors compared to perceptions, attitudes, and experiences, they may still play a role in facilitating the change of one's attitudes.

Limitations and Outreach

- Convenience and snowball sampling of web survey (relying on local partners)
- Demographic representativeness
- Outreach to Spanish speaking population
- Targeting residents who stayed in Eugene for 2 years (with large college population)

Takeaways

- ❑ Perceived health risks lower transit usage and active transportation adoption. Use policies to build trust through transparent communication of scientific evidence on risks.
- ❑ Emphasize the social and individual benefits of reducing driving through social programs and public campaigns to help people understand and experience these advantages.
- ❑ Policy interventions should focus on emphasizing the social benefits of travel behaviors (esp. for transit use and active travels) and implementing programs to achieve those advantages.
- ❑ Increase investment in pedestrian-friendly public spaces and public transit infrastructure. Walkable environments that are enjoyable promote more walking and lead to positive attitude improvements.



THANK YOU!

Q & A's