

MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 24-528 (project 559 | June 2024

Investigating Travel Behavior and Air Quality in Northern Utah



the **ISSUE**

Many regions in the United States experience episodes of poor air quality because of temperature inversions in bowl-shaped urban valleys, the formation of ground-level ozone in sunny locations, or from wildfire smoke. With large and growing populations in these areas, episodic area-wide air pollution is a critical health public health issue. Because the transportation sector—especially gas-powered automobile use—contributes a large portion of air pollutants and precursor emissions, current (mostly voluntary) programs encourage travel behavior change through reduced driving, shifting to public transit and active transportation modes, teleworking, and other strategies. Unfortunately, there is little evidence about how effective such strategies may be. Research in this area is challenged by a lack of person-level data on detailed travel behaviors and travel decisions during periods with good or poor air quality, along with necessary information about people’s attitudes, values, norms, perceptions, and opinions about transportation and air quality.

the **RESEARCH**

To illuminate how area-wide air pollution affects traveler behaviors and to better understand the potential for travel behavior change strategies, we developed a multi-phase longitudinal (travel) survey data collection effort in Cache County, Utah, involving an initial survey about personal and household characteristics, a series of three two-day travel diary surveys during winter 2019, and a final survey about perceptions. We then analyzed the resulting data.



A University Transportation Center sponsored by the U.S. Department of Transportation serving the Mountain-Plains Region. Consortium members:

Colorado State University
North Dakota State University
South Dakota State University

University of Colorado Denver
University of Denver
University of Utah

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Project Title

Identifying Effective Travel Behavior Strategies for Poor Air Quality Events in Northern Utah

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USDOT, Research and Innovative Technology Administration

the FINDINGS

First, we studied how measured (or perceived) poor air quality affected individuals' daily travel amounts, finding little change in trip frequencies or total travel times. We found that respondents were mostly aware of when air pollution levels were elevated. Second, we studied the degree to which people attributed the responsibility for air pollution to themselves or others, finding three groups of people differentiated by various travel, perceptual, and personal characteristics. People assuming more responsibility reported more travel behavior changes. Third, we analyzed 20 different activity and travel outcomes (taken from the travel diary surveys) for associations with air quality, while controlling for personal/household characteristics and neighborhood type. We found some "altruistic" travel behavior changes in response to air pollution, as well as differences for urban vs. suburban/rural residents.

the IMPACT

This research increases our understanding of people's perceptions of air pollution and how they change (or do not change) their travel behavior in response to episodes of area-wide poor air quality. The work is a step toward designing programs that will change travel behavior in a way that will positively impact air quality. We suggest future research in larger urban areas in order to better inform the design of travel behavior change strategies.

For more information on this project, download the Main report at <https://www.ugpti.org/resources/reports/details.php?id=1177>

For more information or additional copies, visit the Web site at www.mountain-plains.org, call (701) 231-7767 or write to Mountain-Plains Consortium, Upper Great Plains Transportation Institute, North Dakota State University, Dept. 2880, PO Box 6050, Fargo, ND 58108-6050.



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