**American Association of State Highway and Transportation Officials**

**Special Committee on Research and Innovation**

1. **PROBLEM STATEMENT TITLE**

Improving Analysis of Demand for Non-Auto Travel

1. **RESEARCH OBJECTIVE**

Develop guidance for more comprehensive analysis of non-auto travel demands, including latent demands.

1. **BACKGROUND INFORMATION AND NEED FOR RESEARCH**

Growing concerns about equity, affordability, public health, safety, congestion reduction and environmental protection support more multimodal transportation planning and transportation demand management. Many jurisdictions have goals to improve and encourage non-auto travel. One major obstacle is the inadequacy of information on non-auto travel demands, including latent demands.

In any community a significant portion of travelers cannot, should not, or prefer not to drive and will use non-auto modes for some, most, or all their trips if those modes are convenient, comfortable, and affordable. Table 1 describes these demands and the costs imposed on users and society if those demands are not served. Communities that improve and encourage non-auto travel often experience significant increases in non-auto travel, indicating latent demands ([Litman and Pan 2024](https://www.vtpi.org/tdmss.pdf)).

*Note: will work information in table into the text or just describe*

***Table 1* Types of Non-Auto Travel Demands** (Brumbaugh 2021; Census 2021; Litman 2024)

|  |  |  |
| --- | --- | --- |
| **Type** | **Prevalence** | **Costs if not Served** |
| Seniors who do not or should not drive. | 5-10% of population. | Non-drivers lack mobility, require chauffeuring (special vehicle travel to transport a non-driver), or must use higher-cost options (such as taxis and ridehailing) or move to another community with better transport options. |
| People with mobility impairments. | 5-10% of population. |
| Adolescents (12-20 years). | 10-20% of population. |
| Drivers who share vehicles. | 5-15% of motorists. |
| Drivers who temporarily lack vehicles. | Varies. |
| Lower-income households. | 20-40% of households. | Lack mobility or bear excessive transport costs. |
| Tourists and visitors. | Varies. | Lack mobility or visit other areas. |
| People who do not drive for religious or cultural reasons. | 0-3% of households. | Lack mobility during religious days or move to more walkable areas. |
| Impaired or distracted travelers. | Varies. | Impaired and distracted driving, increasing crashes. |
| People who walk and bike for health and enjoyment. | 40-60% of residents. | Must spend time and money exercising at a gym or have insufficient exercise. |
| Families with pets to walk. | 20% of households. | Pets lack exercise or owners drive to walking areas. |
| Motorists who benefit from better travel options for others. | Most motorists. | Motorists bear more congestion, risk and chauffeuring burdens. |

*In a typical community, 20-40% of travelers cannot, should not, or prefer not to drive and will use non-auto modes if they are convenient, comfortable, and affordable.*

Stephen Brumbaugh (2021), *Travel Patterns of American Adults with Disabilities*, Bureau of Transportation Statistics ([www.bts.gov](http://www.bts.gov)); at <https://bit.ly/3exIvnQ>.

Census (2021), “*Commuting (Journey to Work)*,” American Community Survey, US Census ([www.census.gov](http://www.census.gov)); at [www.census.gov/topics/employment/commuting.html](http://www.census.gov/topics/employment/commuting.html).

Todd Litman (2024), *Evaluating Transportation Diversity*, Victoria Transport Policy Institute ([www.vtpi.org](http://www.vtpi.org/)); at [www.vtpi.org/choice.pdf](http://www.vtpi.org/choice.pdf).

In practice, transportation planners and modelers often use incomplete data sets, such as the census commute mode share or regional travel surveys, to estimate non-auto travel demands. These surveys tend to underestimate non-auto travel demands, particularly demand for active modes (walking, bicycling and their variants) by overlooking and undercounting non-commute and off-peak trips, travel by children, recreational trips, local trips (those within a traffic analysis zone), and non-motorized links of journeys that include motorized trips. For example, a bike-transit-walk commute is usually categorized as a transit trip, and the trips between a parked vehicle and a destination are generally ignored even if they involve walking many blocks on public roads. U.S. census data indicate that only about 8% of commute trips are by non-auto modes, but more comprehensive surveys such as the National Household Travel Survey indicate that about 17% of total trips are by active modes, with higher rates in urban areas and by lower-income travelers. Because census data ignore non-commute trips, travel by children, and walking or bicycling links of journeys that include motorized trips, these modes are significantly undercounted.

For transit modes, rail and fixed-guideway modes typically have customized ridership forecasting approaches, but ridership forecasting for fixed-route bus and evolving service concepts (e.g., microtransit) can be challenging, especially for rural and small- to medium-sized agencies. Such forecasting often relies on elasticities, sketch tools, and formulas that are dated (e.g., TCRP Synthesis 66, Fixed Route Transit Forecasting and Service Planning Methods, was published in 2006) or newer tools that have not been sufficiently standardized or evaluated (e.g., projections from automatic vehicle location and automatic passenger count data, or big-data tools such as StreetLight Data and Replica).

Serving latent demands for non-auto travel can provide large benefits to the travelers who use those modes, their families and communities. Transportation agencies need better estimates of demand for such travel to incorporate into long-range and scenario plans, short-range and strategic plans, and project prioritization processes.

1. **LITERATURE SEARCH SUMMARY**

Various publications analyze some aspects of non-auto demands, such as travel activity by children and youths, people with disabilities, low-income households, zero-car households, visitors, and people who want more physical activity and fitness. Other studies examine demands for specific modes such as walking, bicycling, bike- and car-sharing, and various types of public transit. Some studies examine latent demands for non-auto travel and the benefits of serving currently unmet demands. However, few studies consider overall non-auto travel demands by all groups, total latent demands, and total benefits of serving them, and few documents provide technical guidance for performing such analysis.

As previously described, current analyses often rely on incomplete data, such as commute mode share, which undercounts non-auto trips, and often overlooks or underestimates latent demands for non-auto travel.

Below are examples of current literature.

Evelyn Blumenberg, Anne Brown and Andrew Schouten (2020), “Car-deficit Households: Determinants and Implications for Household Travel in the U.S.” *Transportation* 47, pp. 1103– 1125 ([https://doi.org/10.1007/s11116-018-9956-6)](https://doi.org/10.1007/s11116-018-9956-6).

Ralph Buehler and Andrea Hamre (2015), “The Multimodal Majority? Driving, Walking, Cycling, and Public Transportation Use Among American Adults,” *Transportation* 42, 1081–1101 [(doi.org/10.1007/s11116-014-9556-z)](https://doi.org/10.1007/s11116-014-9556-z).

Caltrans (2020), *Vehicle Miles Traveled-Focused Transportation Impact Study Guide*, California Department of Transportation (<https://dot.ca.gov>); at <https://bit.ly/3DDSm5H>. Also see *SB 743 Implementation Resources* (<https://dot.ca.gov/programs/sustainability/sb-743/sb743-resources>).

Chad Frederick, William Riggs and John Hans Gilderbloom (2017), “Commute Mode Diversity and Public Health: A Multivariate Analysis of 148 US Cities,” *International Journal of Sustainable Transportation*, pp. 1–11 ([https://doi.org/10.1080/15568318.2017.1321705)](https://doi.org/10.1080/15568318.2017.1321705).

ITE (2023), *Vehicle-Miles Traveled (VMT) as a Metric for Sustainability*, Institute of Transportation Engineers ([www.ite.org](http://www.ite.org)); at <https://ecommerce.ite.org/imis/ItemDetail?iProductCode=IR-154-E>.

ITF (2017), *Economic Benefits of Improving Transport Accessibility*, The International Transport Forum [(www.itf-oecd.org)](http://www.itf-oecd.org/); at [https://bit.ly/3QX64aC.](https://bit.ly/3QX64aC)

ITF (2021), *Travel Transitions: How Transport Planners and Policy Makers Can Respond to Shifting Mobility Trends*, International Transport Forum ([www.itf-oecd.org](http://www.itf-oecd.org)); at <https://bit.ly/3BGJewh>.

Lawson, C.T., Muro, A. & Krans, E. Forecasting bus ridership using a “Blended Approach”. *Transportation* (48), 617–641 (2021). https://doi.org/10.1007/s11116-019-10073-z

Todd Litman (2013), “The New Transportation Planning Paradigm,” *ITE Journal* (www.ite.org), Vol. 83, June, pp. 20-28; at [www.vtpi.org/paradigm.pdf](http://www.vtpi.org/paradigm.pdf).

Todd Litman (2023), *Are Vehicle Travel Reduction Targets Justified*, World Conference for Transportation Research (<https://wctrs-society.com>); at [www.vtpi.org/vmt\_red.pdf](http://www.vtpi.org/vmt_red.pdf).

Todd Litman (2024), *Evaluating Transportation Diversity*, Victoria Transport Policy Institute ([www.vtpi.org](http://www.vtpi.org/)); at [www.vtpi.org/choice.pdf](http://www.vtpi.org/choice.pdf).

Todd Litman and Meiyu (Melrose) Pan (2023), *TDM Success Stories*, Victoria Transport Policy Institute ([www.vtpi.org](http://www.vtpi.org/)); at [www.vtpi.org/tdmss.pdf](http://www.vtpi.org/tdmss.pdf).

Glen Lyons (2020), *The Benefits of a ‘Decide and Provide’ Approach to Transport Planning*, Transport for the North (<https://transportforthenorth.com>); at <https://bit.ly/3F8sst3>.

María del Mar Parra López, Jan Anne Annema and Bert van Wee (2022), “The Added Value of Having Multiple Options to Travel: An Explorative Study,” *Journal of Transport Geography*, Vo. 98 ([doi.org/10.1016/j.jtrangeo.2021.103258)](https://doi.org/10.1016/j.jtrangeo.2021.103258).

WRI (2019), *Reducing Demand for Vehicle Trips in Cities – Learning Guide*, The City Fix (<https://thecityfixlearn.org>); at <https://bit.ly/3u4qtC1>.

WSL (2008), *Adoption of Statewide Goals to Reduce Annual Per Capita Vehicle Miles Traveled by 2050*, Washington State Legislature (<https://apps.leg.wa.gov>); at <https://bit.ly/3rdP6KH>.

Fang Zhao, et al. (2013), *Transportation Needs of Disadvantaged Populations: Where, When, and How?*, Federal Transit Administration ([www.transit.dot.gov)](http://www.transit.dot.gov/); at [https://bit.ly/3QS7Ut1.](https://bit.ly/3QS7Ut1)

1. **URGENCY AND POTENTIAL BENEFITS**

There is an urgent need to better understand non-auto travel demands, including the ability to forecast future demands and the impacts of serving those demands. This study can provide large benefits by better aligning the planning and investment decisions of state DOTs and other transportation agencies with the needs and preferences of transportation system users. Many policy makers and planning practitioners recognize that a significant portion of travelers cannot, should not, or prefer not to drive and will use non-auto modes if they are convenient, comfortable and affordable, and many jurisdictions have mode shift targets, but practitioners lack the data needed to achieve these goals. Current planning practices tend to overlook and undervalue non-auto travel demands, particularly latent demands, resulting in underinvestment. Improving our understanding of non-auto travel demands can make planning and investment decisions more responsive to user and community needs.

1. **ALIGNMENT WITH THE 2021-2026 AASHTO STRATEGIC PLAN**

This project is aligned with the AASHTO Strategic Plan’s Goals and Objectives. It aligns with transportation agencies’ efforts to better connect community, economy, land use and the environment. Improving non-auto transportation helps achieve emerging goals related to equity, social justice and public health. It’s most closely aligned with the goal of safety, mobility and access for everyone, and the objective to advance a safe multimodal transportation system. A better understanding of non-auto travel demand can lead to planning that more effectively responds to users’ needs, and provides more cost-effective investments.

1. **IMPLEMENTATION CONSIDERATIONS AND SUPPORTERS**

The research would be beneficial to state DOT professionals at any level as well as transportation organization partners and stakeholders who all have a vested interest in better understanding the demand for different modes of transportation. Implementation elements include a communications plan to ensure awareness of the research and TRB, FHWA and AASHTO presentations to share the findings. Venues include workshops, peer exchanges, and committee meetings.

There are several other AASHTO and TRB committees interested in transportation’s contribution toward equity that would likely support this project, including:

* AASHTO (assuming these, any others?)
  + Committee on Performance Based Management (CPBM) – Christos Xenophontos, Chair
  + Committee on Planning
  + Council on Active Transportation
* TRB (assuming these, which others?)
  + Performance Management (AJE20) - Michael Grant, Chair
  + Equity in Transportation (AME10)
  + Transportation Planning Policy and Processes (AEP10)
  + Transportation Planning Analysis and Application (AEP15)
  + Public Transportation Planning and Development (AP025) – Peter Ohlms, Chair
  + Bicycle Transportation (ACH20)
  + Pedestrians (ACH10)
  1. Communication and Implementation Funding: $20,000
  2. Communication and Implementation Period: 6 months
  3. AASHTO requirement for interim deliverable review:
     1. Interim deliverable(s): The results of this research are critically important to the DOTs. As such, an interim deliverable is required to be reviewed by the applicable AASHTO Committee(s). The AASHTO Committee on Performance Based Management has developed and sponsored this needs statement on behalf of member DOTs. Interim deliverables could include literature reviews, surveys, interim reports, and full draft reports.
     2. Stakeholder engagement: As part of the interim deliverable, the project team and research panel should engage DOT stakeholders for feedback during the project. Engagement could include webinars, workshops, presentations, surveys, user testing of draft tools, and interim reports and literature reviews.

1. **RECOMMENDED RESEARCH FUNDING AND RESEARCH PERIOD**
   1. Research Funding: $400,000
   2. Research Period: 24 months
2. **PROBLEM STATEMENT AUTHOR(s):** *For each author, provide their name, affiliation, email address and phone.*

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1. **POTENTIAL PANEL MEMBERS:** *For each panel member, provide their name, affiliation, email address and phone.*
2. **REQUIRED KEYWORDS/TERMS** *– 3 required keywords derived from the Transportation Research Thesaurus* (<https://trt.trb.org>)

travel demand, transportation modes, travel models

1. **OPTIONAL KEYWORDS/TERMS**: *3 additional “free text” keywords or terms.*

Non-auto modes, active travel, travel forecasting

1. **PERSON SUBMITTING THE PROBLEM STATEMENT:** *Name, affiliation, email address and phone.*

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