

# MPO HOUSEHOLD TRAVEL SURVEY STATE OF THE PRACTICE

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TPB Travel Forecasting Subcommittee  
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# Background

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- TPB has conducted a regional household travel survey about once a decade since 1968
- During or after the last two surveys, new technologies emerged, and travel behavior shifted
- Members and stakeholders expect more information, sooner, and more frequently
- Household travel surveys are increasingly costly while response rates have been declining
- Household travel survey methods have been evolving



# Approach

- Preliminary, internal memo outlining methods to consider for future household travel surveys
- August to October 2022, performed online research and conducted interviews to learn about recent survey efforts and methodologies employed by other metropolitan planning organizations (MPOs)
- Organized and moderated a panel discussion on Household Travel Surveys on November 30th through the Association of Metropolitan Planning Organization's (AMPO) Data Working Group

Survey Planning

Interviews with Peer Agencies

**Name and Agency:**

**Name of survey used for model calibration:**

**Agency Specific Questions:**

Question	Response

**Survey Methods Under Consideration by TPB:**

We are examining the following methods, what input can you share?

Method	Notes
Smartphone App Based Survey	
More Frequent Travel Surveys (Every 2-3 Years) with Smaller Sample Sizes	
Employ a Mixed-Methods Approach Using Both Probability and Non-Probability Based Sampling	
Consider a Separate Panel Frame Sampling Survey.	

**Other Questions:**

Question	Response
What, if any, issues do you have with using your survey for model calibration?	
What other methods do you suggest considering?	
What have we not inquired about that you think we should be considering?	
Who else do you think we should reach out to?	

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General Notes



# MPOs Interviewed and Recent HTS Efforts

Federally Designated MPO	Contact(s) Interviewed	Most Recent HTS	NextGen NHTS Add-On Samples Acquired
Atlanta Regional Commission (ARC)	Guy Rousseau	2011	Yes, acquired in 2022
Baltimore Metropolitan Council (BMC)	Todd Lang and Robert Berger	2018/19	No
Metropolitan Council, Twin Cities (Met Council)	Jonathan Ehrlich and Ashley Asmus	2019	No
North Central Texas COG (NCTCOG)	Arash Mirzaei and Kathy Yu	1996	Plan to acquire in 2024. Previously used NHTS in 2008/09 and a larger sample in 2016/17
Puget Sound Regional Council (PSRC)	Brian Lee	1999, 2006, 2014/5, 2021	No
San Diego Association of Governments (SANDAG)	Grace Miño	2019, 2023 (in progress)	No
Metropolitan Transportation Commission, San Francisco Bay Area (MTC)	Shimon Israel	2012/3, 2018/9 (partial), 2023	No



# Findings – Agency Background

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The MPOs interviewed can be divided into three groups:

1. Conducting or actively preparing for a more frequent and smaller sample size household travel survey
2. Participating in and purchasing add-on samples through the Federal Highway Administration (FHWA) Next Generation National Household Travel Survey (NextGen NHTS)
3. Planning to conduct a large-scale household travel survey once a decade



# Group 1 - Conducting/preparing for more frequent, smaller scale survey

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- Metropolitan Council, Twin Cities (Met Council)
  - Conducted HTS once a decade until 2013 when staff began asking if it was sufficient and decided it was not
  - In 2016/17, developed a continuous data collection program with three cross-sectional waves every other year from 2019 to 2023
  - Paused collection during the height of the pandemic and instead conducted a separate COVID-19 survey in 2020
- Puget Sound Regional Council (PSRC)
  - Conducted its last large-scale HTS in 2014. After the survey, a large light rail expansion plan was implemented, and the region was undergoing rapid growth.
  - Considered trade-offs of smaller sample size data collected more frequently versus larger sample size data that was a decade old and, in 2016, transitioned to conducting smaller surveys every other year



# Cont., Group 1 - Conducting/preparing for more frequent, smaller scale survey

- San Diego Association of Governments (SANDAG)
  - Conducted its last large-scale HTS in 2016
  - Data quickly out of date with emergence of new modes such as ride-hail/transportation network companies (TNCs), electric scooters, and neighborhood electric vehicles in beach areas
  - Opted to move towards smaller scale and more frequent data collection in three cross-sectional waves (2021, 2023, and 2025)
- Metropolitan Transportation Commission, San Francisco Bay (MTC)
  - Coordinated with Caltrans for the 2012/13 California HTS
  - Observed travel behavior changing at a greater rate
  - Overseeing the transition of a once-a-decade travel diary survey to a biennial cross-sectional survey conducted every other spring, starting in 2023



# Group 2 - Participating in the NextGen NHTS

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- Atlanta Regional Commission (ARC)
  - Conducted its last large-scale HTS in 2011
  - In partnership with Georgia DOT, the agency is moving forward with the NextGen NHTS
  - Pooled fund effort, return on investment, and the latest travel survey methods and technologies cited as reasons
- North Central Texas Council of Governments (NCTCOG)
  - Conducted its last HTS in 1996 and since then used NHTS data for model development
  - Acquired NHTS data in 2008/09 and a larger sample in 2016/17
  - Plans to acquire NextGen NHTS add-on samples in 2024 or later to assure data reflects travel behavior in a post-pandemic era
- Both agencies consider the NextGen NHTS to be an easier to use, lower cost and higher value alternative that aligns with their state DOTs





# Group 3 - Planning for Large-Scale Survey Once a Decade

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- Baltimore Metropolitan Council (BMC) plans to conduct a large-scale survey once a decade
  - COG/TPB coordinated with BMC on the 2017/2018 Regional Travel Survey
  - Considered NextGen NHTS but do not intend to use it to replace a household travel survey
  - Plans to focus on modal surveys and on-board transit surveys and then conduct another HTS in five to seven years



# Opinions on Survey Methods Under Consideration

	ARC	BMC	MET	NCTCOG	PSRC	SANDAG	MTC
Smartphone App-Based Survey	+	-	+	+/-	+	+	+
More Frequent Travel Surveys (Every 2-3 Years) with Smaller Sample Sizes	+	-	+	-	+	+	+
Mixed-Methods Approach Using Both Probability and Non-Probability Based Sampling	+	+/-	+	ND	+/-	+	+/-
A Separate Panel Frame Sampling Survey	+	+/-	+/-	ND	+/-	+	+/-
Attitudinal and Stated Preference Questions on the Survey	+/-	-	+/-	-	ND	+/-	-
Incentives	+	-	+	+	+	+	+

+ = Positive reception. Primarily positive comments.  
 +/- = Balanced reception. Negative and positive comments.  
 - = Negative reception. Negative and/or cautionary comments.  
 ND = Not determined or discussed



# Smartphone App-Based Survey

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- Most MPOs were in favor of the use of smartphone apps with passive data collection for household travel surveys
- Smartphone apps capture historically underreported trips from travel diaries and reduce respondent burden
- MTC recently conducted a demonstration of smartphone apps from several vendors
- Most MPOs cautioned against requiring participants to use a smartphone app and recommended other options such as internet and telephone to ensure accessibility to all groups
- Some agencies have softened the requirements to use smartphone app surveys in recent survey efforts (e.g., Met Council and PSRC)

## Cont., Smartphone App-Based Survey

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- Smartphone app-based surveys require some effort from respondents to report trip details
- App performance, accuracy of trips being captured, bias against populations without smartphones, and imputation for origin and destination noted as potential issues
- Privacy concerns particularly for children's travel; people under 18 are typically not asked to use these apps but child trips may be reported by an adult



# More Frequent Travel Surveys with Smaller Sample Sizes

- Among the MPOs that were interviewed, about one-half conduct or are in the process of moving to frequent travel surveys (Met Council, PSRC, SANDAG, and MTC) for the following reasons:
  - Lower amount of funding needed each survey year / continuous request level
  - Capturing new modes and technologies such as TNCs and micromobility
  - Travel patterns and behavior have become more complex, particularly post-pandemic
  - Other surveys have adopted this approach such as the ACS and the NextGen NHTS



# Mixed-Methods Approach Using Probability and Non-Probability Sampling

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- Most of the MPOs that were interviewed shared an interest in exploring a mixed methods approach
- May expand the reach of surveys for underrepresented groups



# Cont., Mixed-Methods Approach Using Probability and Non-Probability Sampling

- Various techniques mentioned by MPOs include:
  - Partnering with community-based organizations to obtain input and solicit responses
  - Interviews, focus groups, or snowball sampling in target areas
  - For transit on-board surveys, using apps to reach customers and matching it with APC data
  - Oversampling certain geographic areas with a high share of low income and minority groups
  - Social media recruitment



# A Separate Panel Frame Sampling Survey

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- Non-probability based sampling method that replaces traditional sampling frames with online panels for survey design
- Online panels are compiled through intercept or targeted recruitments and have a large sample pool
- Curated panels may yield a higher response rate than the address-based sampling method
- One half of the households in the NextGen NHTS will be recruited using a panel frame sampling method
- MPOs interviewed noted that panel frame surveys can increase responses from hard-to-reach population groups by controlling sociodemographic characteristics
- PSRC noted concerns about weighting panel frame sample data and MTC noted this should not serve as a foundation of a survey





# Attitudinal and Stated Preference Questions with a Travel Diary

- MPO staff stated that adding attitudinal or stated preference questions to a travel diary can dramatically increase respondent burden
- Those interviewed aimed to simplify surveys; adding these kinds of questions can make surveys more complex
- Historically, most household travel surveys have been revealed preference surveys, not stated preference surveys
- NCTCOG commented that attitudinal and stated preference responses may provide insights but are not critically important
- SANDAG limits these types of survey questions to smaller survey efforts with specific topics (e.g., border crossing, parking)
- Met Council noted that attitudinal/stated preference questions should be limited to minimize respondent burden



# Incentives

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- Nearly all MPOs found incentives to be essential to the success of surveys
- In some jurisdictions, federal funds cannot be used for survey incentives
- Various techniques and suggestions included:
  - Targeted/differential incentives such as higher incentives to lower income, large households, and transit dependent
  - Offering lower/limited enrollment incentives followed with incentives at completion
  - Raffle drawings which are less expensive than providing incentives to all participants



# Other Comments and Suggestions

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- Management, coordination and resources
  - Work closely with the team that runs the regional travel model
  - Consider staff capacity and balance with frequency of data collection
- Survey approach and design
  - Focus on hard-to-reach groups
  - Consider modifying sampling frame from household to person based
  - Explore mixed methods with qualitative research methods
- Consider quality control methods and data imputation techniques
- Evaluate other data sources and consider data aggregators, big data, and data fusion



# Next Steps

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- Share findings with TPB members and seek input
- Share findings with the MPOs that we interviewed
- Consolidate input from TPB staff and members and develop recommendations for a future TPB household travel survey



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