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16. Abstract The SWUTC Travel Survey Symposium was held in Dallas on November 8 and 9. More than 70 travel survey professionals attended this event from across the United States, from Florida to Alaska, with one attendee from the City of Calgary (Canada), representing an almost equal mix of agency, consultant, and academic researchers. The symposium started with a poster session, featuring research from 22 related efforts. An opening session followed that included a Texas welcome from Mr. Michael Morris, Executive Director of NCTCOG and a key note speech from Dr. Kermit Wies of the Chicago Metropolitan Agency for Planning. Attendees were encouraged to think outside the box and consider all users of travel survey data as their customers. The symposium was divided into two parts. The discussion groups on Thursday focused on identifying lessons learned and opportunities to advance methods and sampling approaches, as well as considering all uses of the survey data. The day ended with attendees presenting their versions of the “travel survey of the future”—incorporating new technologies, known and on the horizon. Friday, the focus of the symposium discussion turned to identifying what can be implemented now and establishing a research agenda to move us toward the newly identified survey designs.					
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HOUSEHOLD TRAVEL SURVEY SYMPOSIUM



FROM TRADITION TO INNOVATION

2012 Household Travel Survey Symposium
Conference Summary and Final Report

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Conference Hosts and Sponsors

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Southwest University Transportation Center

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December 2013

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SECTION 1: INTRODUCTION AND SYMPOSIUM OVERVIEW

The Southwest Region University Transportation Center (SWUTC) *Household Travel Survey Symposium: From Tradition to Innovation* was held in Dallas, November 8 and 9, 2012, and attended by more than 70 travel survey professionals from across the United States. Attendees represented an almost equal mix of agency, consultant, and academic researchers.

The symposium started with a poster session, featuring research from 22 separate research efforts, followed by an opening welcome from Michael Morris, executive director of the North Central Texas Council of Governments, and a keynote speech from Dr. Kermit Wies of the Chicago Metropolitan Agency for Planning. Attendees were encouraged to think outside the box and consider all users of travel survey data as their customers.

Following the opening remarks, the remainder of the conference time was spent discussing the lessons learned and identifying opportunities to advance methods, sampling approaches, and uses of the survey data. Attendees presented their versions of the “travel survey of the future,” incorporating new technologies, known and on the horizon. The symposium also identified what can be implemented now and established a research agenda to move the travel survey community toward the newly identified survey designs.

The TTI team that planned and managed the symposium presented findings from the event at several Transportation Research Board (TRB) committee meetings at the 2013 Annual Meeting. The TRB Travel Survey Committee members incorporated several of the research ideas into the research needs process. Some of the research ideas have been or will be submitted to National Cooperative Highway Research Program (NCHRP) Synthesis program, the NCHRP Quick Response program in planning (08-36), and full NCHRP problem statements. In addition, the symposium results were presented at the 2013 TRB Planning Applications Conference, in a presentation entitled “Travel Surveys of the Future.”

This report summarizes the symposium and provides final documentation regarding the event. This section provides an introduction to the symposium, including the poster session and opening remarks. The second section documents the discussions that took place at the event and closing remarks from participants. The appendices include the conference program and attendee list. Where available, internet sites are hyperlinked to provide direct access to materials in electronic format.

All symposium materials are located at <http://tti.tamu.edu/group/mobility-management/conferences/household-travel-survey-symposium-2012/>.

POSTER SESSION

Moderator: Chris Simek, Texas A&M Transportation Institute

The symposium program was purposefully developed to be discussion-focused rather than centered about podium presentations. To ensure that participants were current on recent studies, a poster session was held before the symposium.

Poster abstracts were solicited two months prior to the symposium, through a call for posters. The call solicited posters in the following topical areas:

- Methodology
 - What is the state of the practice with regard to (1) frequency of survey conduct, (2) pros/cons of single vs. multi day survey collection, (3) pros/cons of alternative designs, such as continuous or panels surveys?
- Survey Content
 - What is the state of the practice with regard to survey content? What variables are collected and what priority should be placed on these variables?
- Sampling
 - What is the state of the practice with regard to survey sampling? What are the most prominent frames (random digit dial, address based frames, etc.) and what are the pros/cons of each?
 - What are the acceptable and affordable ranges of statistical error associated with each step of the survey process?
- Technology
 - How is technology being used in household travel surveys? What are the pertinent issues?
- Advance Notification/Incentives
 - What is the utility of mailing to 100% of the sample (for address based sampling)?
 - What are the effects of incentives on response rates?
 - Are there effective alternatives to cash incentives for increasing response?
 - What is the proper balance of incentive vs. advance notification?

Approximately 25 abstracts were received, of which 22 were accepted. Table 1 summarizes the accepted poster by author and title. See <http://tti.tamu.edu/group/mobility-management/conferences/household-travel-survey-symposium-2012/> for additional poster details, including the posters and the abstracts.

The poster session took place from 8:00–9:30 a.m. on Thursday, November 8, 2012. Symposium attendees were asked to vote for their favorite poster. The votes were then tabulated and the top three vote getters were given a small award. The winners are identified with an asterisk (*) in Table 1.

Table 1: Summary of Accepted Posters

Poster Number	Primary Author	Title
1	Sharon Ju	Comparing 1995 and 2009 HGAC Household Travel Survey for Trend and Congestion Analysis
2	Susan Horst	New Customers for Household Travel Surveys
3*	Jeffrey Gonder	The Transportation Secure Data Center (TSDC) - Providing GPS Travel Activity Data for Transportation Modeling and Analysis
4	Gregory Macfarlane	Use of Credit Data to Inform Travel Behavior
5	William Bachman	Using GPS-based HTS Data for Identifying Operational Transportation System Needs at the Community Level
6	Mia Zmud	2012 CMAP Latino Travel Survey: Lessons Learned Using a Non-Traditional Approach for Recruiting Hard-to-Reach Populations
7	Elaine Murakami	Current Results of Using Incentives to Improve Survey Participation
8	Robert Lordo	Emerging Techniques for Capturing Long Distance Travelers
9	Yanzhi Xu	Impacts of Survey Length and Sample Size on the Precision Level of Key Travel Behavior Variables
10	Adella Santos	Unexpected Insights: In the 2009 National Household Travel Survey Add-On Program
11	Susan Swain	Comparing Two Similar but Different ABS Methodologies: Recruiting Households into Regional Travel Surveys
12	Marcelo Simas Oliveira	Integrating Advanced Technologies into a Web-Based Stated Preference Survey of Transit Riders
13	Shane LeBouthillier	Moving to a Continuous Household Activity Survey Program (CHASP)
14	Elizabeth Greene	Panel Survey Approach for the Urban Partnership Agreement (UPA) and Congestion Reduction Demonstration (CRD) programs
15	Ed Hard	TxDOT Travel Survey Program
16	Leslie Meehan	At the Intersection of Transportation, Physical Activity and Health: Using GPS and Accelerometers in a Regional Household Travel Survey
17*	Jeremy Wilhelm	The Cleveland Area GPS-Based Household Travel Survey
18	Philip L. Winters	Lessons Learned Using Mobile Phones to Track Multimodal Travel Behavior
19	Arun Kuppam	Lessons Learned While Testing New Data Collection Technology
20	Jerry Everett	Off-The-Shelf Tracking App - A Viable Travel Survey Tool?
21*	Sandra Rodriguez	Route Scout
22	Shi-Chiang Li	South Florida Internet-based Route Choice Survey

CONFERENCE WELCOME AND KEYNOTE SPEAKER

Moderator: Stacey Bricka, Texas A&M Transportation Institute

Speakers:

Texas Welcome: Michael Morris, North Central Texas Council of Governments

Keynote Speaker: Kermit Wies, Chicago Metropolitan Agency for Planning

Conference Welcome

Stacey Bricka, Texas A&M Transportation Institute (TTI), made the following opening remarks:

This conference is about three things:

It's about time. The last household travel survey-focused conference was held in 1995 in Irvine, California. That event led to the development of a practical research program that has carried the travel survey community through to today. The outcomes from that event included a clear research agenda and problem statements that led to funded research.

Of the attendees at this 2012 symposium, 7 people attended both the 1995 and 2012 events. In addition, of the agencies represented at the symposium, 13 agencies supported staff attendance at both the 1995 and 2012 events. These numbers show continuity in the field, as well as diversity.

It's about change. I think most of you would agree that our current approach to conducting travel surveys is unsustainable. Most of society looks at us like we're crazy because the current process includes mailing out paper diaries, which we expect households to fill out, and culminates in a telephone retrieval call that could last as long as an hour. There is so much that has changed in terms of technology, general survey research methods, and the industry as a whole. Take sampling for example. Obviously RDD landline sampling is not the answer. What is? I'm hoping that is a question we can answer while we are here together.

It's about you. Finally, in designing this event, we purposefully stayed away from conference of podium presentations. We focused on creating an environment for discussion, for you to share your thoughts and ideas. Everyone here is either in the trenches or has been in the trenches—trying to find the best approaches for conducting these surveys, working with the public, working with funding constraints and trying to figure out how to make it all come together to provide for the data that we need for transportation planning. So your insights, your ideas, your input are critical to the success of the conference.

Texas Welcome

Michael Morris, Director of Transportation for the North Central Texas Council of Governments (NCTCOG) welcomed attendees to Texas and made the following remarks:

Welcome to the Dallas/Fort Worth region. Thank you for taking the time to be here. My background is in what you do. And everything you do I feel is extremely important. Stacey, thank you very much for inviting me.

Let me give you some context of our region so you get a feel for what we do. NCTCOG has four staff here today (Arash, Behrouz, Kathy, and myself). Six and a half million people live here. One million people have come to this region every 10 years since 1960. So we anticipate another few million people coming in the duration of our current Metropolitan Transportation Plan. So when the four of us wake up, we are planning for 9 million persons. To put this into perspective, I moved here in 1979. There were 3 million people in Dallas/Fort Worth in 1979. So in my tenure at the MPO, we have grown more than the size of the region was when we started.

We have a very analytical foundation in the planning that we do here. I don't know if you have been following the types of things we do, be it hazardous materials truck service routing, travel surveys, travel demand forecasting, or emission estimation, we believe in a strong analytical foundation. And our elected officials expect a strong analytical foundation. Do not tolerate for a moment if where you work your policy officials want you shunned away because you analytical, unbiased data people are going to make them make a decision that is actually better than the political decision they wish you to make. You may feel that. You may sometimes see it. But if you create an analytical foundation it will become like a magnet when those other policy officials say "look, we have to do more with less. Let's calculate some cost-benefit ratios or let's forecast if this project is still needed in the future." So please keep to that analytical base.

I don't know how many were at the conference in Irvine. I sense there was more. We have got to mentor and grow the analytics of the people that come behind us. So we have to strive every day for more hiring of analytical people or 20 years from now there will be 40 people at this conference. We spend millions of dollars on data, not just Household Travel Surveys. Lots of data. Those data drive this analytical foundation. They drive a collegial policy experience.

We have \$19 billion worth of transportation projects under construction here in the Dallas/Fort Worth region. The pedestrian park, which you have to see over Woodall Rogers, opened last week. The largest light rail line in the country opened last year. The Wright Amendment and a whole new Love Field Airport is being created. Three toll roads are under construction. One hundred and twenty nine sustainable mixed use development projects are underway. It is the analytics that drive cohesive policy development, which drives innovative finance, where a private sector business community can get behind an area. That drives innovation, but it can't go anywhere without the foundation of an analytical position.

This conference is a great opportunity for you. I happened to be able to go to graduate school in engineering. My background is in transportation engineering. I spent most of my career in travel demand forecasting and simulation. I would say three quarters of what I learned in travel demand forecasting and data collection was through peer exchanges, meetings like this. Having an opportunity to go to Atlanta a few times and be on a peer exchange committee and then also go to Cleveland, San Francisco, and Denver, I love the format of this conference. It is about peer exchange. And speaking is just as important as listening in a peer exchange.

You've got a third public sector folks, a third universities, a third of the folks from the private sector here in attendance. What a terrific opportunity to really see the balance of conversation with regard to how we move this industry forward. So there needs to be lots of communication from lots of perspectives and you need to listen as much as you speak. And I remind you, in the legal profession, if you follow Supreme Court decisions, the reason why minority opinions are written in law is because the minority

opinion often becomes the majority opinion at some point in the future. So as you talk about the role of technology in Household Surveys everyone thinks the right way to go is x and you really in your heart think it is y, you need to say it is y. They may not believe you today, but often that minority opinion becomes the majority opinion. Someone is going to take that comment, go back and explore it a bit more, and see where that opportunity takes them.

Before activity-based modeling, someone knew production-attraction balances and smushing all of that in a model system was somewhat convenient, but probably wasn't really representing the behaviors that we all do every single day, and was the minority opinion for some time. With greater analytics that opinion became the majority. We do pilots; we look out for each other, we do peer reviews and continue to drive those analytics. We have peer review people that sometimes speak in languages that are 40 years old, and somehow in a conversation they are taken care of through these peer review exchanges. But you have to, you owe it to yourself and the people you mentor, to make those comments.

We are at a crossroads. Being at a crossroads is a terrific opportunity for us. I'd look at constraints as a positive thing. Constraints breed innovation. A lot of you probably look at constraints as a negative thing, but here we can really look at the role of technology and how technology can help us to a better job. I think we can all do more with less. I don't mean we should put less amount of money into data collection, but there are transportation projects—a five level interchange at LBJ and Central Expressway, a beautiful piece of work—is \$250 million. But would a four level interchange for \$180 million and more money going to something else maybe have been a better decision? Probably, and some of that money may have needed to go to data collection and other things that we do.

I am impressed since Hurricane Sandy on how much attention is given to FEMA and I think you probably have picked up on this, with regards to the Waffle House performance measure. I don't eat at them. There are a few here. You know you are in a Waffle House because your shoes stick to the linoleum. Do you all know what a Waffle House breakfast place is? In Florida, which apparently has a ton of them, they have a performance measure where they know if there is power to the Waffle House, whether the cash register is taking receipts, and FEMA then uses that data to drive where they put their responses. If that Waffle House, which is open 7 days a week/24 hours a day, is not open, then obviously there is a power problem. I have been reading every day now. FEMA, the Waffle House, the data, the imagination, the cleverness with regard to that. And in the North East there aren't as many Waffle Houses, so they didn't have the same type of database to help drive it.

So I think in our profession there are often ancillary databases that we aren't thinking of. I think you can calibrate arterial speed and volume equations if you pay attention to the GPS transit data that are in that particular corridor. You back in using the stop density frequencies, dwell times, and acceleration rates to get a good feel for what the arterial speed should be. Keith (Lawton), we talk about that at almost every peer review. When the roadway guys focus on where they are going and the transit guys focus on where they are going and then we don't have this notion of Waffle House datasets potentially helping. I bet if I sent you a survey—of course I didn't know anything about the Waffle House datasets until four days ago. But if I sent a survey to you all before you came here and said "well, give me some different disciplines that could be involved." None of you would have said Waffle House database sending emergency equipment to certain locations. But I will bet that we as a profession have not discovered yet those opportunities in our profession that could increase the validity of what it is we are trying to do.

The key word Stacey said is sustainability. We are getting beat up by Tea Party folks about using the term sustainability. Somehow the U.N. used the word 38 years ago and since they hate the U.N., and they use the word, then you can't use the word. I think we should embrace the word sustainability because with new technologies maybe we can have more sustainable databases. Maybe we shouldn't be doing Household Travel Surveys because we can only afford them every x number of years. Maybe we need to look at sustainable databases where we can track activities on a continuous basis as we move forward.

I am going to see if anyone has any questions here in a moment but I am going to end with my requests for you here for your conference. **The first item I hope you do is to think outside the box.** So if your career, like mine, was based on non-linear volume delay equations you can come to a conference and talk about other than non-linear volume delay equations. It is okay. Talk about other things or you have an opportunity through these peer exchanges where someone might say something you didn't think of. And you say "well, maybe we should try this." Think outside the box.

Second, take advantage of the peer exchange from this particular conference. I predict that you will all learn, as I would if I was able to stay here the whole time. You will all learn more in the next two days about data collection than you will the rest of the year when you go back home. I don't care what you read. I am on the TRB executive committee. We have lots of reports. But the opportunity of actually making a change in what you do is through this peer exchange, so please participate by listening or speaking or both.

Think of all the users. And I like your discussion group too, on your agenda, where you are looking at data collection or all the user groups. Transportation isn't just taking 89% of the users that travel by car and moving them 17 seconds faster with a billion dollar freeway interchange. When we build freeways we should be focused on reliability. How do we sustain the reliability through good design and ITS technology? We should be building passenger rail systems because they are reliable. They run to schedule. People travel on airplanes because they are reliable with regard to getting you to your destination. The issue in my mind isn't congestion—it is reliability. It is the standard deviation of the trip that is critical. It is not the mean of the trip that is critical and we need to start sending our databases through variation as a way to influence policy officials, not through the means with regard to that. So think of all those user groups of which we have to represent, the people that don't have transportation or our ability of collecting data to make their world a better place.

The one I am most intrigued by now— we have Y generation folks that behave very differently, and maybe more positively, than say my generation. I got my driver's license 2.6 seconds after I was legally eligible to get it. Something like 22% of the Y generation still doesn't have a driver's license, and I am thinking that may be good. Now my question for you as data folks, and you can all send me an email on it after the conference, is what happens to the Y generation as their cohort ages and moves into new life stages will they maintain their current travel behavior over their life? If so, then we have a real challenge in forecasting the future because we need to take into account that when we stand up and say this toll bond is defensible, but in the back of our head we have Y generation folks that maybe aren't driving as much, and we are forecasting this revenue stream over 40 or 50 years, we aren't being honest with ourselves if we can't answer that type of question. So do the behaviors that we measure at a certain point in time stay constant? Does the Y generation or the next generation behave similarly so we can cross classify data by age? Or is there some behavior that gets transferred up that we aren't accounting

for. So I need a practical answer to that question and give it to Arash so we aren't making any mistakes with regard to that.

I want to thank the partners. We have had partners for several years with Federal Highways and universities. This is a small club. Keith, you have worked on this for a year or two. Arash doesn't let me do this anymore, but he does come visit me once a month as we brainstorm how we can do things. But I think data collection is fundable. I don't know if you are going to have any sessions or worries about how we are going to fund data. It is very fundable. There are four key elements and you can steal whatever way we fund data back to your policy officials. The data have to be purposeful. There has to be imagination in the data. Let's call it the Waffle House notion. There has to be some sort of technology or cost effective nature to it, and it has to be sustainable. Meaning this isn't a sort of \$1 million deal to do something for one point in time. It has to be a data collection that lives and breathes.

Reach out to your partners. There are people outside of your organization that believe in what you do, be it an environmental interest, air quality interest, business interest, or others. I am working on a sustainability of freeway management program, talking to insurance companies and maybe when there is a car accident the car isn't put into a parking lot for four days where they are charging that insurance company \$100 dollars a day to park it there. Maybe we bring technology into a modern day tow truck notion, and the person says "I have All State or State Farm," and the car is delivered to that reputable place. Insurance companies save hundreds and thousands of dollars on each incident, and they help pay for the freeway management program as part of a new partnership. So, think outside the box.

Thank you very much for inviting me. I came over and unfortunately I can't stay because our MPO board is meeting today. I have time for a question or two if anyone has any thoughts. I don't know how much you know or don't know about us, and if there is anything I can do to help you I want to make sure I can do it. Thank you very much.

Keynote Speaker

Dr. Kermit Wies, Chicago Metropolitan Agency for Planning, provided the following presentation on transportation planning and presented attendees with his thoughts on the need for the travel survey industry to increase the contextualization of travel surveys in the future.

What is it you want? And why do you need to know?

Household travel surveys ask a lot of questions. I'm sure that, in the course of responding to all the personal questions, most survey participants work up a lot of questions of their own.

So, to put the shoe on the other foot, I've organized my talk around some questions that we should be able to answer about ourselves.

Who am I?

I am 52 years old, male, white. There are no other persons in my household. But I do have two cats; and I believe there's a squirrel living in my chimney. I have a graduate degree and my household income is between \$25,000 and \$250,000. My household has one automobile, one garden tractor and 4 bicycles.

My entire career has been with the Chicago MPO serving in a wide variety of functions from managing our travel demand models, to writing our long-range plan, to managing our household travel survey. Lately, I've been pushing us into advanced modeling practice. I've pretty much tried it all.

In college, I majored in Urban Geography, got hooked on computers and went to Urban Planning School so I could get a job where I could help solve society's problems. Once I had a job, I went back to school because I noticed that urban planning in practice worked nothing like what school said it would be. My dissertation was in Game Theory, which is all about how individuals make choices under uncertainty.

Because of this, I have a simultaneous fascination with why observed data look the way they do and immense suspicion of what the data are actually telling me.

How do I use household travel survey data?

One of the biggest misunderstandings I've encountered from urban planners is that household survey data are needed to run a travel forecasting model. In truth, household travel surveys are needed only for model development—to statistically estimate the importance of particular choices being made in a particular context. Context, however, is the trickiest part of model development and is typically grossly oversimplified or ignored all together.

What do I mean by context?

Once a travel model has been estimated using survey data, an experienced practitioner (i.e., anyone who's tried it more than once) will routinely adjust these statistical estimates for one of two reasons: 1) the values don't make sense in relationship to each other, or 2) they don't validate independently observed outcomes.

How could this be? We have survey! Because in almost all cases the behavioral framework for travel choices is rather generic and we are just trying to customize it to local conditions. Statistics allow us to incorporate specific contextual details through constants, but household travel surveys don't have that option; they can either capture context or ignore it. If the survey questionnaire is pre-designed and must be adhered to without variation, then there is a good chance that many contextual variables are being ignored.

Of course, the best way to use a good survey database is to custom-design each model to reflect each respondent's context. Every person, then, would have their own model. In practical terms, this would mean gathering rich contextual information from each recruited person, including consumer preferences, physical health, emotional stability, aversion to risk, apathy, and tolerance for change. Only after we had established a choice hypothesis based on these, would we go back and monitor their travel behavior, by necessity over a period of time.

Few modelers have attempted this outside academia. Most practitioners opt instead to transfer a pre-existing travel model to their region and re-estimate the parameters based on a static behavioral hypothesis.

How did we first meet?

Travel models and household surveys, that is.

Sixty years ago, government intervention was the widely embraced solution to social and economic challenges. Government could win wars, stimulate economic growth, and raise prosperity for all.

Modern urban transportation was a new and inspiring planning challenge. Many households bought their first automobile during the 1950s and by the 1960s they were adding a second. Freeways were being built, trolley cars were disappearing, supermarkets and shopping malls were feeding voracious consumer appetites.

City skylines created by streetcars and multi-family tenements were instantly outsized by gas stations and suburban ranches on ¼ acre lots. Rural land that had been generously arrayed with two-lane highways in the 1920s for the exclusive use of farmers was now primed for speculation by shopping mall developers, subdivision homebuilders, and airport planners. Everyone expected to drive their own car directly from their attached garage to their job, school, and grocery store.

Urban planners believed that, with enough data, we could make sense out of this new pattern of behavior and design the optimal configuration for a new layer of transportation infrastructure. We also believed that the problem could be reduced to a sequence of mathematical relationships. New digital computers would help by performing the millions of calculations needed to discover and explain the elasticity of people's travel decisions. And these statistical procedures, as we all know, only needed a representative sample in order to predict the choices made by the entire population.

And so an industry was born

By the 1970s, this data-driven style of urban planning was the industry standard, sustained mainly by the federal highway program and its requirement that transportation plans be “continuous, comprehensive and cooperative.” (These are the kind of words that draw plenty of ants to the picnic.) Federal bureaucracies, regional governments, subsidized computer applications, and (most importantly) consultants quickly sprouted in response to the rapid expansion of highway capital programs, further multiplying as the repercussions of those programs introduced a whole new class of urban problems.

Originally intended to simply identify the capacity needs of new highways, the travel modeling tools (and by extension the surveys that informed them) were soon being asked to explain the impacts of spiraling declines in public transportation use, flight from urban centers, increasing air pollution, and overdependence on automobiles. Again context rears its head.

And inertia sets in

By 1980, as Interstate construction was winding down, there was little political appetite for continued improvement in both the data and modeling techniques needed to cope with the stickier and more persistent problems of urban mobility. Urban regions continued to grow, but new capacity could not keep pace. Transportation solutions became more strategic—carpooling, parking, tolls.

The 1980 Paperwork Reduction Act also wreaked havoc on USDOT's ability to enforce its own planning regulations, essentially eliminating an MPO's requirement to document or share the technical information it used to make transportation decisions; MPOs were even asked to “self-certify” that they were competent to do business. As a result, very few planning organizations conducted travel surveys or updated their travel models during the 1980s.

Suburban sprawl became the default land use as new development sought to isolate itself from underperforming urban infrastructure. Inner city communities declined commensurately. The original Interstate freeways were reaching the end of their useful life. Some were underutilized but most were highly congested. Public transit was viewed a panacea for central city revitalization with some spectacularly embarrassing results. And, within a very short time and almost completely unnoticed, the

single largest contextual change influencing personal travel occurred: the emergence of the two income household.

So we were ready for a renaissance of sorts

Household surveys are difficult to conduct and statistical models are difficult to understand. Once we have a template that works, it's hard to motivate ourselves to change it. Unless it's patently obvious that it doesn't work anymore.

By 1990, transportation planning was pretty much a free-for-all. Congressional earmarks dominated the funding authorization and local decision makers evidenced very little technical accountability in asserting the costs and benefits of investment decisions. Cost overruns were typical, but more insidiously, transportation investments were often justified by extremely sloppy and self-serving benefits calculations. USDOT had been, for the most part, emasculated of its role in stewarding urban mobility and was instead expected to simply rubberstamp the special interests that had secured Congressional backing.

Our unlikely knight in shining armor was the US Environmental Protection Agency, seeking to enforce a provision of the 1970 Clean Air Act, which stipulated that federal funds could not be used on public works that would worsen air quality. The technology to support enforcement became widely available in the late 1980s and so the Clean Air Law was amended to require transportation's conformity with air quality using quantifiable targets.

Armed with this amendment, the environmental lobby (e.g., Sierra Club, American Lung Association) began pressuring large MPOs, citing obsolete data and technical tools. But the argument that carried the day in court was...contextual! Most judges had no appetite for digesting the subtleties of valid sampling and parameter estimation. Rather, it was the transportation planner's habit of neglecting to explain how a region would look *without* a planned new highway facility.

And so transportation planning's role in environmental sustainability became the target of a new era in federal regulation and guidance. By 1995, new perspectives on how transportation influenced urban development, along with desktop computer technology, breathed new life into both household travel surveys and travel demand models. In the ensuing 10 years we saw the emergence of computer assisted telephone interviews, web-based surveys, GIS, activity-based travel demand models, GPS recorders, and network microsimulation.

But we're not in Kansas anymore

For survey research and modeling professionals, it should feel just like the 1970s again. We're needed and in demand. Unfortunately, we have quickly become stuck in the middle of the hate-hate relationship between the government and its people. And this is partly of our own making.

The complete social revolution that would explain what happened is far too complex to dissect here. But we do know that, as a general rule, adults are very suspect of a government planner's assertion that their participation in our survey will have any effect on our ability to better manage their transportation. Congress has been chastised for building a "bridge to nowhere" and public transit chimeras are more numerous than not. On top of this, we live in an age of missing children and stolen identities. The notion that any representative sample of an informed public would find it prudent or safe to divulge the sort of details we ask about in our surveys is far outweighed by concern for their family's security and

their apprehension that such a generous act of civic responsibility will make a lick of difference in their lives.

And clicking your heels three times won't help

If I had to parse out the challenges with today's typical household travel survey, I would do so as follows.

Household: The significance of the household as the unit of statistical analysis for travel behavior has been continuously eroding for the past 30 years. In fact, the traditional household has never been as sacrosanct as has been portrayed in either travel surveys or forecasting models. Particularly in dense urban areas, households defined by conventions of blood or marriage are frequently confounded by additional or missing members, especially with regard to parental roles. Beyond a household's member composition, the environmental context of household activities, i.e., interpersonal and neighborhood influences, quickly confuse explanations of travel choices derived from more obvious variables such as time or cost. Basing the survey or model unit on the household is like grabbing a saucepan before you decide whether you're making soup or salad.

Travel: Our models treat travel as discrete activities, and household travel surveys are typically designed to capture individual trips. Even with the recent practice of offsetting the diary design to emphasize activities (with trips being incidental between them), we are once again missing important contextual features about travel behavior. Personally, I don't view my travel as set of discrete choices from which I select the option that maximizes my personal utility. Travel is part of my continuously evolving daily activity pattern that I assess only in its totality at the beginning and again at the end of each day. I started biking to work so I could quit the gym, I invested in a Kindle and earplugs so I could stand riding public transit. Auto companies make their vehicles into fun little living spaces complete with eye-catching aesthetics, heated seats, and satellite radio. Long rail commutes offer a quiet respite for parents being conveyed from hectic careers to daycare pickup; what else can explain our suburban operator's policy of designating "quiet" cars and permitting open alcohol on p.m. rush hour trains? Yet we still treat travel as an unchanging incidental burden over which we have little control.

Survey: Though I'm less qualified to critique the science of survey research, there are some aspects that I feel are more the result of miscommunication between modelers and survey researchers. Because modelers have the luxury of validating their predictions against independently observed conditions (e.g., traffic counts, transit boardings), the established survey research rules that govern sampling method and bias control seem excessive. Granted these are critical when the survey results are being used to *establish* the choice framework, but as I mentioned before, most travel models come with a pre-established hypothesis. It's more important to ascertain whether a survey response conforms to that hypothesis than to sample at a rate that absorbs as error what might be a significant gap in the model's predictive capacity. In other words, traditional household travel survey design often ends up blocking our view of the contextual variables that might lead to new qualitative insights.

And so, let's use this opportunity to think outside the box

The issue papers cover a large range of technical issues. They deal mainly with the mechanical challenges of technology, sampling, methods and data needs. But they also introduce some unorthodox avenues to consider. So please remember the big picture, particularly with regard to the challenge of properly capturing and conveying contextual variables in the survey design and execution. And please don't be lulled into a false sense of complacency by modelers who say they don't need contextual information. They either don't understand or don't care how important it is to the behavior they are expected to predict.

SECTION 2: DISCUSSION GROUPS

The symposium was designed around a series of discussion groups. The discussion group topics focused on key household travel survey issues, and for each session, the moderators facilitated discussion about a series of questions. Supporting materials included a series of white papers and the posters presented at the start of the symposium.

There were three rounds of discussion:

1. The Past/Lessons Learned
 - Survey Methods
 - Sample and Hard-to-Reach Populations
 - Data Uses and Data Needs
2. The Future/Surveys of the Future
3. Moving Forward/Turning Discussions into Reality
 - Research Priorities and How to Fund them
 - Writing RFPs that Reflect Symposium Findings
 - Building, Communicating, and Sustaining Travel Survey Programs

Each discussion group started their session with brief introductions of participants and a review of the discussion questions. Participants provided feedback for each question and all three break-out groups reconvened after discussion sessions to report their findings back to the entire symposium. This document details the topics, discussion questions, and findings for each break out group.

Survey Methods

Discussion Group 1 Topic: Survey Methods

The following are the topic, moderators, questions, and summary of findings for Discussion Group 1.

Discussion Group 1 Moderators:

Edwin Hard, Texas A&M Transportation Institute; Chris Tatham, ETC Institute

Discussion Group 1 Questions:

1. What are the key issues or challenges with regard to survey methods?
2. What opportunities do we have to improve our methods? (Prioritized)
3. What research do we need to implement these new methods?
4. What changes to current practice can we implement now?

Discussion Group 1 Summary of Findings:

Question 1: What are the key issues or challenges with regard to survey methods?

The group discussed the following issues and challenges regarding survey methods:

- Respondent Based Challenges:
 - Declining response rates with current surveys/methodologies (particularly in the U.S.).
 - Difficulty with response rates with hard-to-reach populations persist.
 - Issues persist with the more detailed nature of survey questions that leads to respondent misunderstanding and inability to answer (tradeoff between detailed data requirements and survey efficiency).

- The length of surveys can be burdensome to respondents.
- Respondents may be less likely to participate because of privacy concerns.
- Motivation of respondents and the use of incentives—increasing unwillingness of respondents to participate in lengthy telephone interviews.
- Conveying relevance of the survey to respondents. We are not sufficiently conveying the rationale and importance of our surveys.
- Perception by respondents of data collection redundancy among households participating in both a diary/CATI survey and a GPS component (for determination of trip underreporting rates).
- Data and Survey Design Challenges:
 - No one-size fits all sampling or survey methodology exists.
 - High data collection costs using current techniques.
 - Increasing data needs to satisfy advanced models.
 - There are constraints and limitations with single-day travel surveys.
 - Risk adverse mindset among survey community/sponsors.
 - Lack of recognition regarding the limitations of GPS and smartphone survey technologies.
 - Difficulty of integrating diverse data collection methodologies into a single survey.
 - Biases and data quality issues related to multi-method surveys.
 - Challenges related to representation, stratification, and the weighting of samples.
 - Issues surrounding the transition from RDD to address-based sampling—following up with households in address-based samples can be slow and may lack personal interaction to clarify questions and improve recruitment.
 - Limited access to information and information relevancy for address-based samples in rural areas.
 - Challenges of accurately imputing trips in GPS-only surveys.
 - Requirement for sponsor education on survey methodology tradeoffs in some cases.

Question 2: What opportunities do we have to improve our methods?

The group discussed the following opportunities to improve methods.

- Opportunities at the survey design level:
 - Leverage email to facilitate interaction with households in address-based samples.
 - Increase use of GPS and other technologies for direct measurement of travel (as opposed to reported travel).
 - Leverage web-based surveys to improve data collection and processing efficiency (e.g., automatic geocoding of trip ends via Google Maps).
 - Consider weekend travel in surveys and models, not just Mon-Thurs or Fri.
 - Utilize multi-day surveys or continuous/panel surveys to avoid snapshots that may not reflect typical travel.
 - Take advantage of the potential of smartphones and apps to collect both GPS positioning data and questionnaire information for surveys, reducing survey instrument and equipment deployment/retrieval and streamlining data processing (notwithstanding bias, technology and possible liability issues).
 - Explore use of probability-based panels to improve survey targeting.
 - Explore the use of external data from sources such as apps to provide household travel survey information or context.

- Opportunities at the RFP Level:
 - Incentivize survey innovation in RFPs.
 - Append sample RFPs (both new and old) to Travel Survey Manual as a resource to compare and share RFPs for project development in prospective study areas.
- Opportunities at the Respondent Level:
 - Incentivize respondents to participate in surveys (small pre-paid incentives may improve response rates, targeted use of incentives to encourage participation in efficient web-survey components may also hold promise).
 - Assess data gaps and utilize incentives in a more targeted fashion for recruitment of hard-to-reach populations.
 - Improve respondent experience to enhance survey recruitment and completion (incorporate more elements that are enjoyable or useful for respondents).

Question 3: What research do we need to implement these new methods?

The group discussed the following research needs.

- Develop understanding of what motivates respondents to participate in household travel surveys and find ways to better convey importance of data collected.
- Identify ways to improve survey response rates among younger demographics.
- Identify opportunities to share survey results with participants and provide useful feedback or information that elicits participation.
- Compare data obtained from traditional surveys with those collected using new technologies to validate emerging methodologies, identify shortfalls, and track changes over time.
- Determine how to incorporate and integrate results from multiple survey methods used in the same project.
- Establish methods on how to statistically compare results of surveys conducted at different times, using different techniques.
- Understand what variables are relevant for weighting and stratifying samples.
- Study the key determinants of a person's travel behavior and research ways to analyze and compare person trips from one area to another (to what extent are factors unique to individual study areas or are they transferable).
- What are the external factors/influences on travel behavior that modelers and planners have no control over (e.g., economy, internet, lifestyle values).
- How can data sources outside of the travel survey be leveraged to confer context and enhance the travel survey (e.g., credit card information).
- Is it possible to move away from the household as the basis of measurement in travel surveys and what would it take.
- Investigate development of algorithms to streamline survey data collection and minimize respondent burden through imputation of GPS trips and other information.

Question 4: What changes to current practices can we implement now?

The group discussed the following currently implementable changes.

- Use existing technologies:
 - Introduce more web-based survey recruitment and data retrieval.
 - Increase use of GPS and smartphone technology in travel surveys.

- Reexamine how RFPs are developed:
 - Incorporate greater flexibility with respect to RFPs and survey design (encourage consultants to provide innovative survey methodologies—don't just rely on 10-yr old RFP templates).
 - Solicit vendor input into RFP development process to enhance suitability of survey design and take greater advantage of private-sector expertise.
 - Set aside a portion of project budget for “discovery” to identify potential survey improvements and opportunities.
- Data sharing and incorporation:
 - Leverage household travel surveys as a vehicle to collect data that may be useful to others (beyond transportation modelers, e.g., health, safety, air quality stakeholders).
 - Break down traditional silos, bureaucracy, and other data sharing impediments to create synergies that can also spread out survey costs.
 - Begin to incorporate data from outside sources to supplement information collected in household travel surveys.
 - Improve dissemination of survey information and results to participants and the public at large (e.g., create household travel survey website and post explanatory videos and results there—involvement of public agency is critical).

Sample and Hard-to-Reach Populations

Discussion Group 2 Topic: Sample and Hard to Reach Populations

The following are the moderators, questions, and summary of findings for Discussion Group 2.

Discussion Group 2 Moderators:

Margaret Petrella, Volpe; Jason Minser, Abt SRBI; Mia Zmud, NuStats

Discussion Group 2 Questions:

1. What are the key issues or challenges with regard to sampling for hard to reach populations?
2. Who are our hard-to-reach populations and what are the best approaches for improving their survey participation levels?
3. What research do we need to improve our approach and what opportunities exist that will improve our approaches?
4. What changes to current practice can we implement now?

Discussion Group 2 Summary of Findings:

Question 1: What are the key issues or challenges with regard to sampling for hard to reach populations?

The group discussed the following key issues and challenges.

- Apathy on the part of respondents.
- Respondents consider maintaining diaries to be a burden.
- Is sampling at the household level correct? Hard to reach populations may have non-traditional households so sampling at this level may not be appropriate.
- Is less, more? Do we have design overkill? Are samples too large?
- Historically it has been difficult acquiring respondents from low-income and minority households.
- Statewide surveys have same issues with hard to reach populations.
- Are hard-to-reach populations thought about when developing questions?
- Could the reason that we have lower participation from minorities be because there are comparatively fewer respondents in that population?
- Are sample sizes decided before vendor is brought on, or should collaboration occur after award?
- What do you do before the initiation of the survey in terms of community outreach?
- Language barrier: some respondents may not be proficient in a language (e.g., Spanish) even if it is their native language.
- Why are we not doing different types of sample design?
- Let's target hard-to-reach groups first rather than after the fact.
- Use more money for hard-to-reach populations.
- Are we oversampling specific groups? In other words, do we need "X" percent of targeted groups, etc.?
- Some households have a life cycle variable and that should be part of sampling.
- There is a need to look at household size for household surveys.
- Regarding minorities, race is not part of the model and race issues are not related to household behavior.

Question 2: Who are our hard-to-reach populations and what are the best approaches for improving their survey participation levels?

The group discussed the following points regarding who the hard-to-reach populations are and best practices for increasing participation.

- Who are hard-to-reach populations?
 - Typically defined as low income, minority, and large households.
 - Survey community must be sensitive when defining populations: for example, it is not just the Hispanic population, but a subset.
- Best approaches for improving survey participation:
 - Attempt a community-based approach that involves direct engagement.
 - Incentives need to be tailored to the specific subpopulation.
 - Attempt to have travel surveys be relevant to the lives of the hard-to-reach population.
 - Think about groups at the RFP stage.
 - Simplify the message.
 - Use community based organizations.
 - Make message specific to hard-to-reach groups.
 - Tailor incentives to populations.
 - Use community liaisons.
 - Use statistical techniques instead of getting more surveys, without having recruiters do it all. Can use numeric statistics, but it will not capture behavior! Must be very careful if choosing this approach.
 - Design one survey, for all, but that is why response rate will be low. Must recognize heterogeneity of population.
 - Don't have to ask same questions to everyone. Design tiered level survey with last layer of survey being the smallest group.
 - Approach community-based organizations; MPOs may not be the best outreach resource.
 - Schools are well distributed throughout the community. Train teachers, and they can train the students.

Question 3: What research do we need to improve our approach and what opportunities exist that will improve our approaches?

The group discussed the following research needs.

- How can we combine tool kits? Can we match methods to appropriate sub-group?
- What methodology works for which population?
 - Identify the markets we are targeting. How do we stratify these markets?
 - Integrate what others have done.
 - How do we do a national survey? Even statewide?
 - Is it a *travel* difference, or a *cultural* difference?
- What is working elsewhere?
 - National Education Survey.
 - Other countries.

Question 4: What changes to current practice can we implement now?

The group discussed the following currently implementable changes.

- Use smaller sample sizes.
- Augment data from other sources – take advantage of the data that are already obtained. This is doable, but difficult.
- Use 3-tiered approach – ask fewer questions to large group, then get smaller sample size, and increase number of questions to refine the sample size.
- Incorporate best practices from outside the travel survey field, like election surveys and general market surveys.
- Design samples with objective to get proper variance estimation.
- Need to better understand subtle interchanges that can impact how people respond, regardless of survey mode.
- Use data from the National Household Travel Survey (NHTS).
- Evaluate the best use of address-based sampling.
- Modify the survey design to be more participant specific.

Data Users and Data Needs

Discussion Group 3 Topic: Data Uses and Data Needs

The following are the topic, moderators, questions, and summary of findings for Discussion Group 3.

Discussion Group 3 Moderators: Keith Lawton, Consultant; Krishnan Viswanathan, CDM Smith

Discussion Group 3 Discussion Questions:

1. What are the new and emerging data sources and what does it mean for us? This includes GPS, Cell Phone Traces, ACS, CTPP, LEHD, NHTS (from providers like Airsage, INRIX, TomTom, Info Group, etc.
2. What role does/should emerging data sources (credit card data, cell phone traces, etc.) play in informing the use of travel survey data? Should we pursue methodological improvements to better integrate this type of data?
3. What implications do data usage, data needs, and the presence of secondary data have for methods and sampling?
4. What research do we need to better understand these issues?
5. What changes to current practice can we implement now?

Discussion Group 3 Summary of Findings:

Question 1: What are the new and emerging data sources and what does it mean for us?

The group discussed the following new and emerging data sources.

- Credit Reports
 - Georgia Tech is currently working to combine trip data and demographic data to eliminate the need for travel surveys. Credit reports can serve as a source of demographic data, while trip data can be obtained from companies like commercial data providers. If these data can be combined, they have the potential to be cheaper than performing a travel survey. This may be a way to replicate what we are doing now with fewer resources but getting bigger samples.
 - It may be a challenge to impute trip purpose, trip activity, or land use. It may be easy to be overwhelmed by the volume of data that are available. Imputation may be easier if we identify a typology of agents (i.e., this person has been at the mall for eight hours, three days a week, therefore they must be working)

Driverless Cars

- As driverless cars become more prevalent, that will obviously change data behavior.

Tracking Behavior Change

- We don't have a good way of tracking behavior change. One solution may be to move to a more continuous source of data, such as panels. Some people do different activities on different days. We may get more out of giving up old technologies. With new technologies, we may be able to get data for more days. Once an instrument is deployed, we can get multiple days of data with little additional effort.

Toll Road Data

- The number of toll roads is projected to increase. Most MPOs don't go back after the fact and see how right or wrong they were in their models. Roadways, such as toll

roads, that are privatized may be a good source of data. Anyone who has a toll tag transponder could be a potential source of a lot of daily data. This could be especially important in big metropolitan areas. By 2035, 25 percent of roads in Dallas are projected to be toll roads.

- Privacy is an important issue to consider. Transponder information got into the hands of auto dealerships and was being used for marketing purposes, which is now illegal in Illinois.
- There is the question of who will use the toll facility. The issues of value of time and value of reliability are important, but may not be constant. Value of time is a vague concept. People may use toll roads even when frontage roads are not congested. Getting a toll form from the toll operator may be a better option because they have a relationship with their customers.

Data Transferability

- We may be able to transfer data obtained from a specific toll road to use with toll roads in general. If transferability is possible, the whole country may not have to collect data. Of specific interest is transferability of parameters.
- Transferability of models may be a possibility with the credit data. Is this marketing data just as good as data we are using for current models? Is imputed income from credit companies just as good as asking someone to tell you their household income? Using credit data it may also be possible to track changes in household make-up.

Data Fusion

- The credit data that Georgia Tech has access to contain the variables of education, life style variable, and the six previous addresses and how long they lived there. This level of detail may allow for links to household location choices to be studied and to study the effect that preferences versus location have on travel choices. Georgia Tech linked credit data with vehicle data from the DMV and has access to emissions test data for 2009, 2010, and 2011.
- One limitation of these data is that the credit data are not linked to whether someone is a worker, so this information had to be imputed. So far, Georgia Tech research has shown that senior/non-senior status had a better fit than whether an individual was imputed to be a worker for ownership auto models. The credit data sample contains 22 percent of the population of Atlanta and cost \$25,000 to obtain. In terms of travel data obtained from commercial data providers, it is not possible to get data from them that are raw; they'd only give you aggregate data.
- One important question that is raised with this discussion is, "What is the degree of desired precision when linking different data sources?"

Commercial Data Providers

- Commercial data providers cluster people's locations. Based on the data it is possible to try to see their routines. Commercial data providers generally have access to cell phone carrier data and patterns can be categorized quite easily. The latest carrier data dates back to 2008, however, some data were started to be collected much more recently. Commercial data provider's data allows for answers to questions like, "How long did it

take people to move back to Joplin, Missouri, after experiencing a devastating tornado?”

Workplace Location Data

- We seem to have an obsession with workplace location. Do we really care about this anymore?

Household and Neighbor Interactions

- It would be interesting to consider household interactions and neighbor effects. We could use cell phone data to see how households and neighbors interact with each other during the day and model it. It may be possible to link credit card information to cell phones and their interaction with household members. It is difficult now but may become more feasible in the future.

Secondary Data Value

- A promising area of research may be to consider what the cost benefit of secondary data sources is and what you are getting for the cost.

Area Conditions

- Value lies in using data to describe the conditions of your area. We need to put more emphasis in using the data to see what is going on in a given area.

Weighting

- Determining which set of weight should be used is a large part of modeling. If the data are not being used in a model, just state the results are based on a sample to bypass the issue of weighting.

Sampling Unit

- If you have data that are unrelated to the household are the data still useful? If you have a small enough subcategory you are working with, you may not need to consider the household as much. Can we classify the household and only survey one person in the household? This may reduce costs. It may be necessary to get information about every household member but this can be difficult to do.

Traveler Perceptions and Awareness

- We are lacking data on people’s perceptions of their own travel behavior. People may not be good at reporting their travel behavior. We need information on the perceptions and information people are using to make their transportation decisions. How aware are travelers of their options? People may not be really thinking about what they are doing, and may not necessarily be trying to maximize their utility.

How Do We Define a Good Model?

- The real value of a model is to show the value of sensitivity. We should not get caught-up in defending a number. Brian Gregor did a study of the Medford, Oregon, area and came up with 40 different models. With the same amount of money, he could cover 70 percent of those scenarios. We may be wasting a lot of resources.

Psychometric Measures/Risk Aversion

- It may be interesting to create a typology of persons. How do people think? How do I expand that into a universe? In California, attitudinal data have been used in choice models. How do people go through the process of making a decision? What aspects are important for people in making decisions? We may need to consider the flexibility of activities (i.e., time, people, etc.).

Data over Time

- How do we look at things over time in a model sense? Should we be using continuous data/panels?

Some broad comments were made as follows. All models are wrong, but some may be useful tools. What do we expect from these models? We should base our data needs on that. Also, there is a need to work with the younger people that will eventually use the models being created.

Question 4: What research do we need to better understand these issues?

The group discussed the following research needs.

- Can multi-day or continuous data be used effectively?
- How do attributes and perceptions change behavior?
- How can different data sources be fused together to provide for a more useful analysis?
- Should the household be the unit of analysis?
- How can non-traditional data elements, such as credit card information and commercial data provider's data, change the travel surveys of the future?
- How can participant burden be lessened?
- How can surveys be shown to have value to decision makers, beyond just modeling purposes?
- How can workplace location data be better defined, collected?
- Can any survey data be used for tolling purposes?
- Are respondents fully aware of the details of their travel activity to accurately report it?
- Are younger generations changing their preferences about driving?
- Should future survey methodologies be more focused on continuous data, such as GPS?
- Can tolling or transit data be used as an effective data fusion source for travel survey purposes?
- Can data from tolling and transit agencies be easily acquired?
- Can an abundance of data provide a better context of travel behavior?
- Can personal privacy be protected with the more detailed datasets of the future?
- How do we marry the need for privacy and the need to use large datasets? A standardized approach to handling personally identifiable information may be useful.
- Regarding the political process: Don't be fooled into thinking that what is currently possible with merging large private datasets. Similar approaches may be blocked by law in the future (e.g., Chicago dealership acquiring tolling data to see what make/model people are driving).
- How can frameworks about data collection techniques be developed when the technology is constantly evolving?
- How can prompted recall be applied for interactive surveys?
- Research needed for development of a new model:
 - What data do we need and how do we collect them?
 - What is the statistical significance of the data?

- Ask data providers to show an example of the data you will get from them.
- How many samples do we need to have a model that is statistically significant?
- What are you losing by not having enough of a sample to create the model you want to create?
- Do we really have a better option than utility maximization models?

Question 5: What changes to current practice can we implement now?

Activity-Based Models

- What other bits of data do you need to do activity-based models?

Surveys of the Future

Following the first round of discussion and report backs, participants were again divided into three separate break-out groups and asked to provide feedback on three identical discussion questions on Surveys of the Future. Participants provided feedback for each question and all three break-out groups reconvened after the discussion session to report their findings back to the entire symposium. The questions posed to each group were:

1. Design a survey of the future that addresses our issues, takes into account our lessons learned, and assumes that we've been able to conduct the research to identify the best way to incorporate new methods and technologies.
2. What of that design can we implement now?
3. What research do we need to move to this new design in the future (prioritized)?

Discussion Group 4A Topic: Surveys of the Future

The following are the moderators, questions, and summary of findings for Discussion Group 4A.

Discussion Group 4A Moderators:

Kouros Mohammadian, UIC; Jean Wolf, GeoStats

Discussion Group 4A Summary of Findings:

Question 1: Design a survey of the future that addresses our issues, takes into account our lessons learned, and assumes that we've been able to conduct the research to identify the best way to incorporate new methods and technologies.

The group discussed the following aspects of the travel survey of the future:

- What is the purpose of travel surveys? What elements should be in surveys and what portions are implementable now?
 - Travel surveys should:
 - Have prioritized uses, statistical significance, variables.
 - Survey core with add-on ability to address other purposes.
 - Consider the burden to the respondent.
- What are some ideas for surveys of the future?
 - Idea #1 – Data mining/leveraged data.
 - Device traces purchases (credit card).
 - No recruiting.
 - Idea #2 – Simulated travel.
 - Virtual reality POD – could capture context as well as trips.
 - Idea #3 – Custom modules for different user/sponsors.
 - Idea #4 – (Passive) Videotape everything a person does.
 - Auto-processing to extract details.
 - Idea #5 – A Dream.
 - Use wearable GPS w/smart phone for 3 days (nothing more).

- Idea #6 - Schedule vs. Revealed (ask “why?”).
 - Activity plans.
 - Passive movement revealed.
 - Compare, follow, understand.
- Idea #7 – “HAL.”
 - Smartphone with “real” time.
 - “AI”-like similarity.
- Common Themes.
 - Multi-day survey.
 - Passive form.
 - Customized modules (“why?”).
 - Collect group travel info.
 - Make sure that survey tool is relevant to participants.
 - Provide incentives for longer participation.
 - Can travel surveys be cost neutral?

Group Discussion Question #2: What of that design can we implement now?

The group discussed the following aspects of the survey of the future that are implementable now:

- Technologies that are available or underutilized that could help implement travel surveys of the future:
 - Social media.
 - Data mining.
 - Twitter or FB.
 - Radio Frequency ID (RFID).
 - Bluetooth.
 - Land-use and location-based technology.
- More survey techniques available or underutilized that could help implement travel surveys of the future:
 - More cultural and social data sources.
 - Cognitive testing (to determine what respondents think of our questions).

Discussion Group 4B Topic: Surveys of the Future

Discussion Group 4B Moderators:

Elaine Murakami, FHWA and Timothy Michalowski, Abt SRBI

Discussion Group 4B Summary of Findings:

Question 1: Design a survey of the future that addresses our issues, takes into account our lessons learned, and assumes that we've been able to conduct the research to identify the best way to incorporate new methods and technologies.

The group discussed how the following existing and emerging technologies may be used to improve travel surveys of the future:

- GPS.
 - Using GPS units may make it possible to correct for errors that currently exist in models.
 - GPS may make weekly surveys more feasible, which would allow for differences by day to be considered and emission data to be collected.
 - GPS surveys have been done for 18 years, so maybe not a survey type of the future. However, different ways to use GPS are evolving.
 - The National Household Travel Survey has not yet used GPS.
 - It may be possible to use GPS data to answer health-related questions or consider multimodal travel because GPS units have accelerometers.
- Tablets and smartphones.
 - Tablets and smartphones are becoming more and more prevalent.
 - Tablets and smartphones may advance surveys to the point where retrieval interviews are unnecessary.
 - Remember that some data can be collected using a flip phone. Smartphones are not the only type of phone that can be used to collect data.
 - Researchers at UC Berkeley used a smartphone to show people their VMT and how many calories they burned. Participants were given scores and feedback on their VMT and calories and people were found to increase their walking trips over the course of the survey.
- Random Moment Surveys.
 - This method of surveying has been implemented and reported on by NielsonLife360.
 - You send a text to people asking them what they are doing at that very moment.
- "Bring Your Own Data."
 - Taking a "Bring Your Own Data" approach may improve the feasibility of multi-day surveys.
- Combination of Survey Technologies.
 - Not everyone in a household may have a smartphone to record their data, so having multiple survey type options is important.
 - For some people's needs, surveys of the past may be better.
 - It is important to consider the use of different survey modes (i.e., CATI, interactive GPS during/after survey, web recruitment/recall/retrieval, Smartphone, pen and paper).

- It may not be possible to get some of the population to use GPS, so the survey community should be open to any survey method, as long as it improves the response rate.
- Different demographics may have different needs, so although certain things work, the survey community must keep trying new methods because there are various emerging demographics.

The group continued to discuss other issues besides technology that will shape the future of travel surveys:

- Core Components of Survey vs. Additional Surveys/Questions of Interest.
 - It may be necessary to have a core household travel survey and then build upon that in the future.
 - Is the household travel survey going to be the core in the future? In 20 years, survey participants may be asked about greenhouse gas emissions and congestion. Thus, we may need to expand the definition of “the core.”
 - It may be necessary to perform additional surveys to learn about travel attitudes and behaviors (i.e., Puget Sound, Urban Partnership Agreement projects, and Utah Statewide Survey).
 - A high percentage of people seem willing to participate in a survey asking about their attitudes and behaviors. Maybe this type of survey is more interesting to them.
 - It may be possible to use survey respondents to recruit others to participate in another study (i.e., naturalistic driving study-SHRP report).
- Imputing Data.
 - It may be possible to impute data from responses from just a subsample of the population.
 - Imputing travel mode and purpose may reduce the burden placed on respondents. The survey may say something like: “Here’s what we think you did. Is this correct? Can you concur?”
 - NCHRP 08-89 is already working to study data imputation effects.
- Smarter Sampling.
 - A tiered approach could be used with travel survey administration. A larger sample may be asked a smaller number of questions and a smaller sample may be asked a larger number of questions.
 - People may be getting rid of their home phones, which should be considered in survey sampling and design.
 - It may be necessary to focus on smarter sampling to obtain data for small, yet important, subsamples (i.e., carpoolers).
 - Address-based sampling has the potential to lead to finer and finer geographic specifications.

Question 2: What of that design can we implement now and what issues should be addressed with innovating travel surveys?

The group discussed the following opportunities and challenges to implementing travel surveys of the future:

- Battery Life.
 - An app does not currently exist that can capture data for a full day; we may have to make some compromises on what data are collected.
 - Participants should be warned that a travel app may drain their phone's battery.
 - A combination of GPS and WiFi may be used to help with the battery life issue.
 - Once you determine a person is not moving, you could tell the GPS to turn off. However, you'd have to be careful with how this is used because turning the GPS off and on too frequently is not desirable
 - A critical path algorithm could be used to determine how many points you need to reconstruct a travel path.
- Incentives.
 - It is important to build value to the user for providing data.
- Considering Special Subgroups.
 - Bike and pedestrian trips have not been captured well in the past. These types of trips will become even more important as baby boomers become seniors. These types of trips need to be captured in a useful way that can lead to developing accessibility using the infrastructure.
 - It is possible that 95-year-olds may be driving in the future because they are using a smart vehicle that is talking to the infrastructure.
- Respondent Burden.
 - Survey respondent burden could potentially be addressed if data needs were disaggregated (i.e., travel vs. behavior) and obtained using different, smaller surveys (*as was discussed previously under the first question heading*).
- Response Rates.
 - Declining response rate is an issue that needs to be addressed in surveys of the future.

Question 3: What research do we need to move to this new design in the future?

The group discussed the following research needs for the future of travel survey design:

- Mode of Data Collection.
 - Is travel behavior correlated to the mode of data collection?
 - What is the best method for a given study?
 - How do the data collected using different methods compare in quality?
 - What are the advantages/disadvantages of web based surveys versus interviewer based surveys, particularly with regard to data quality?
 - A GPS auto-sleep application could be developed to address this issue.

- Merging Data Sources.
 - What are the effects of merging different sources?
 - From an outsider's perspective, new methods that involve merging different data sources may not be very pure.
- Survey for Generation Y.
 - How are we going to create a survey for Generation Y?
 - We need to make it fun (i.e., state preference and make it like a game).
 - Generation Y is much more socially conscious and interested in using social media. Maybe something could pop-up on their cell phone/within social media platforms and ask about their trip.
 - We want to make it seem like taking a survey is a cool thing and that all of their friends are participating as well.
 - Generation Y wants their time to matter. It may be attractive for Generation Y if by completing a survey, they get to pick a charity to donate to.
- Social Media Sampling.
 - How effective is social media sampling, which is often used to recruit people and their friends for a survey?
 - How do we manage the bias?
 - How does this type of sample compare to a traditional survey?
 - Do we have enough resources to go through and clean-up the data obtained in this way to make them useful?
- Single-Day vs. Multi-Day Surveys.
 - What are the differences between single-day and multi-day surveys?
 - Can multi-day surveys be afforded?
 - What are the weighting issues with multi-day surveys?
 - What are the weighting issues associated with using ACS estimates?

Discussion Group 4C Topic: Surveys of the Future

The following are the moderators, questions, and summary of findings for Discussion Group 4C.

Discussion Group 4C Moderators:

Karen Faussett, Michigan DOT; Sandra Rodriguez, NuStats

Discussion Group 4C Summary of Findings:

Question 1: Design a survey of the future that addresses our issues, takes into account our lessons learned, and assumes that we've been able to conduct the research to identify the best way to incorporate new methods and technologies.

The group discussed what will be different and what will be the same regarding sampling methodologies and travel surveys of the future:

- Sharing data between cities.
- Data transferability across regions.
- Sampling needs to be taken very seriously, it is not effective to simply take advice from a consultant.
- Starting with key objectives is critical to the development of a survey.
- A statistical study on sampling should be conducted before issuing an RFP. Enough time should be planned to account for data collection. Each survey needs to be treated differently.
- Discussions regarding cost versus accuracy need to become industry standards.
- It may be preferable to engage the consulting community before issuing an RFP, so that consultants are familiar with the sampling methodology before proposing on a project.

Question 2: What aspects of travel surveys of the future can be implemented now and what issues should be addressed in regards to these innovative travel surveys?

The group discussed the following opportunities and challenges to implementing travel surveys of the future:

- What will be done with data at the completion of the survey should be specified to the participants.
- Cataloguing transit trips is difficult because multiple data points need to be entered that describing the point of transit between each segment of a trip.
- Documentation on travel survey methodologies needs to be stronger so practitioners can incrementally improve their survey designs.
- Communication between agencies that plan to use survey data needs to occur before the survey methodology is formulated, so that a survey can be designed to best fit most of their needs.
- Scalability in testing methodologies needs to be considered for survey design.
- GPS data collection cannot be applied for monitoring travel activity across every mode.

- Surveys and related processes are not standardized. When comparing different surveys, it can be difficult to assess different methodologies.
- If a great sampling process is not developed in the beginning of a survey, a lot of time will be spent in the end trying to weight the samples.

Question 3: What research do we need to move to this new design in the future?

The group discussed the following research needs for the future of travel survey design:

- How does technology influence travel behavior? Does GPS monitoring cause participants to travel more or less as opposed to not being tracked?
- A clearinghouse should be developed that describes what is currently being done in practice and what may be proposed for the future (similar to a TRB research in progress). Documenting lessons learned would also be beneficial for others to see.
- How can innovations from travel surveys be applied to other areas of research (e.g., tolling)?
- How can the importance of innovating travel surveys be communicated to others who are not well versed with this topic?
- Should travel survey standards be developed?

Research Priorities

Discussion Group 5 Topic: Research Priorities and How to Fund Them

The following are the moderators, discussion questions, and summary of findings for Discussion Group 5.

Discussion Group 5 Moderators:

Guy Rousseau, ARC; Susan Swain, Westat

Discussion Group 5 Questions:

1. What are the key symposium findings regarding research priorities?
2. What are our funding options? How do we pursue them?
 - a. Note: should discuss pooled fund, NCHRP, add-ons to regional studies and NHTS, others.
3. How do we organize our research priorities according to those funding sources?
4. How do we “sell” this research? What value does it have to the funding sources?
5. How do we track progress in this area?

Discussion Group 5 Summary of Findings:

Question 1: What are the key symposium findings regarding research priorities?

The group discussed research priorities by asking “what do we mean by prioritization?” It was established that prioritization should be defined as “putting preferences on the research and looking at issues that are experiencing immediate concerns.” The following research priorities were discussed:

- Use of technology and GPS post-processing is important.
- We need to make sure we are using data correctly.
- Should data be weighted? Or should we just focus on what our data are telling us?
- Practitioners may have different priorities.
- Understanding planned travel and comparing it to actual travel is less of a priority because it is not a survey methodology question.
- The issue of data fusion is an important topic.
- Studying the implications of GPS data is important, but NCHRP 08-89 is working on this right now.
- Data imputation is also an important research area. Data imputation has implications with the NHTS add-on data. Maybe we should consider how to combine cell and land-line data within the NHTS. We also need to consider how to impute data from GPS app data. In this case, the subsample used to impute may need to be a little higher. We need to gage how much to ask without creating too much response burden.
- Data based on cell phone triangulation are also important. How do we get better data using cell phone data? Using cell phones we can get flow movements but it is harder to track trips. For instance, commercial data provider’s data are cell phone based. The cell towers have certain spacing. However, we can improve the imputation of information not captured by the towers. What about hard to reach populations? Commercial data providers data are taken from a black box, which is difficult to use for research purposes.

Question 2: What are our funding options? How do we pursue them?

The group discussed the following funding opportunities and how they should be pursued.

- University Partnership Programs.
 - An example of this is NCTCOG who can only give money to schools in Texas. There is no bidding process, and generally \$50,000–\$100,000 can be provided to do the work. All of the funds come from TxDOT. However, a lot of MPOs do not focus on research and have programs like this in place.
- Pooled funding options.
- CTPP Program.
 - CTPP made a list of small topic areas they thought were interesting and emailed this list to universities. This may help PhD students get a dissertation topic. For example, the topic of whether person-based or household-based sampling should occur may fall nicely into a category like this.
- University Transportation Center (UTC) Money.
 - We currently have 22 UTCs, there were 60 UTCs, and there will soon be 35 UTCs.
 - This may be used to jointly fund PhD students.
 - Could potentially use local match options.
- TxDOT SPR funds.
 - These funds can be used to support modeling in the state.
 - Maybe more states are not doing this.
 - TxDOT has a schedule of travel surveys, but every state DOT is very different.
- NCHRP Reports.
 - Some of these research ideas may make good NCHRP projects.
 - Some people have submitted a proposal to study cell phone use (it was a long process).
 - 08-36: Standing Committee on planning quick response.
 - The research needs write-ups are only supposed to be a page or page-and-a-half.
 - We should find out the AASHTO scope and schedule.
- Fund commercial data providers to improve their data?
- Partnering with other fields to get data.
 - For example, collecting walking travel data through CDC.
 - The areas of health and the environment have a lot of money.
 - Companies such as Apple and Google may be interested in data fusion.
 - Atlanta is doing its second activity-based survey. There are a lot of data on eating out. Restaurants want to tap into this data source. Atlanta may let restaurants pay to have access to these data in order to help fund future surveys.
 - AARP may be interested in helping fund surveys that get at the travel patterns of retired people. This is an example of how other people may want access to transportation data.
 - We may want to partner with cell phone companies.
- Focus on incentives.
 - Not just money.
 - Get an app related to transportation that the participant may be interested in.
 - Customize incentives to respondents' interests.

- Allow to choose different incentives.
- Basic economics: Cash is the best incentive is true unless someone like Ben and Jerry's helps pay for the incentive as part of a marketing fee.
- Pooled funding and shared costs.
 - NHTS Add-ons.
 - CTPP.
 - Health.
 - Department of Energy.
 - Ask different agencies about their data needs.
 - Shuffle some funding so least among of money is used/wasted.

Question 3: How do we organize our research priorities according to those funding sources?

The group discussed how to prioritize research needs based on available funding:

- Some companies do internal funding.
- Pooled funds for managed lanes can be a tool to fund research.
- Transit Cooperative Research Program.
- Business model within the state of Florida.
- Federal Highway: IDEA program.
- Gaming and virtual world: Sort of like stated preference.
 - We're not sure if actions are only done in game, or if they would reflect real life decisions as well.
- Maybe talk to SIM City: What travel demand model do they use?

Question 4: How do we "sell" this research? What value does it have to the funding sources?

The group discussed the following issues regarding "selling" research and the value of "selling" research to funding sources:

- If TRB has identified it as a need.
- You don't want respondents to feel like their contributions are making you a profit.
- Surveys could be done and then bought from government agencies, or from consultants who already collected data?
- There is the potential to add some survey questions onto existing survey and get "free data."
- Don't let not having perfect data make you not use really good data.

Question 5: How do we track progress in this area?

The group discussed the following issues regarding tracking progress with respect to funding sources:

- Geo-focused household surveys in DC.
- Puget Sound Transportation Panel.
 - Three PhD students at Illinois graduated using these data.
- Panels.
 - The modeling community hasn't decided what to do with panel data.

- Are people changing behavior and attitudes? Panels .
- Panels: car choices, housing location.
- Longitudinal data: Need same individual over many years.

The discussion closed with the point being made that there is a need to share research as there are research organizations who want to tap into the data that have been developed. The group expressed a need to compile all related research. It was mentioned that UTCs have a research-in-progress database, but that not all of the projects worked on at universities are funded through UTC. It was also mentioned that the travel survey community can learn of research that is currently being done by talking to people at symposiums and TRB. The group also mentioned that IBM has its own research initiative called “Smart Cities” or “Smart Planners” and that it would be helpful to see if they are funding some research that may be of interest to the travel survey community.

Writing Requests for Proposals

Discussion Group 6 Topic: Writing RFPs that Reflect Symposium Findings

The following are the moderators, discussion questions, and summary of findings for Discussion Group 6.

Discussion Group 6 Moderators:

Arash Mirzaei, NCTCOG; Jesse Casas, Westat

Discussion Group 6 Questions:

1. What are the key symposium findings regarding immediately implementable changes to current methods?
2. How do we communicate to the broader travel survey community that these changes would be beneficial?
3. How do we communicate future recommendations?
4. How do we track progress in this area?

Discussion Group 6 Summary of Findings:

Moderator comments:

In this session, we tried to address the issues with household travel survey projects that sometimes occur as a result from how the RFP is developed. The client has a significant role in defining the data need, accuracy of the product, budgeting, and making the project useful in the overall planning and application environment.

Clients may lack expertise or resources to understand the complexity, accuracy, methods, and budget that they have to specify for their projects. These may result in issuing RFPs that are too general in describing data needs, unclear specification for data quality, too rigid or irrelevant method requirements, or unrealistic or undetermined budget.

Clients might purposely keep the RFPs too general to leave room for further decision making in the procurement process or sometimes in the design phase of the project. When the client receives the proposals, it is faced with defined options to choose. It is much easier to choose than to lead but it is unlikely that the final choice matches the real needs, which was not specified at the first place. The real needs will eventually become clear in the application of data a few years later. This unclear process is unhealthy for all sides as it weakens the relevance of the data in the planning process. Unfortunately, the cycle may continue without any corrective action because the frequency in conducting household travel surveys is low, usually once in 5 to 10 years (or less frequent for small area Metropolitan Planning Organizations); therefore, institutional memories are lost and little constructive feedback is used in the next procurement process.

It is also possible that the RFPs are too rigid to allow for a large number of contractors to apply for the RFP. Household travel surveys are labor intensive and require streamlining the process to be profitable. During proposal development, contractors try to match their process with the client's needs. RFPs with vague needs may result in wide range of responses. Rigid RFPs that leaves little room for application of

different contractor methods may limit the responses to the RFP and may therefore bypass any cost efficiencies or value-added outputs or products.

This session provided an open forum for exchange of ideas between clients and contractors to find a balanced approach in the development of RFPs.

The moderators opened the discussion by providing some background on RFPs from their respective (consultant and public-agency) viewpoints and touched on the contrasting needs for RFP structure to ensure satisfaction of basic data requirements and bid specificity/comparability with the importance of RFPs to allow for consultant flexibility and innovation that may benefit the project. The following is a summary of the discussion questions posed and the feedback and suggestions provided.

Question 1: What are the key symposium findings regarding immediately implementable changes to current methods?

The group discussed the following immediately implementable changes:

- Conduct a meeting with all relevant stakeholders at the very beginning of the project (prior to pilot test) to confirm and prioritize data needs.
- Alternatively, break projects into two separate contracts, one to identify data needs and the other to execute the data collection effort, or hold a workshop with stakeholders prior to writing the RFP so that data needs and synergies can be identified beforehand and incorporated into a realistic RFP.
- Consult with vendors prior to developing the RFP, this can bring insight and expertise to the table that may not be available to MPOs that conduct travel surveys on only an infrequent basis (e.g., every 10 years).
- Ensure that survey data requirements are realistic and correspond to the sampling plan and project budget.
- Providing an end-product specification approach to data requirements and RFPs can help ensure that sponsor gets what they need but can still allow for flexibility in how vendor achieves this.
- “GPS-only” surveys are already being conducted and can be incorporated into RFPs. This concept is beyond the pilot phase but the application depends on specific data needs and comfort level of client with new technologies and procedures.
- Traditional methods of data collection may be better suited to model requirements and can facilitate data comparisons over time, but emerging methodologies that reduce respondent burden are viewed by some as critical moving forward.
- RFPs that include budgets are preferred by consultants because they define and level the playing field while still allowing for innovation (budgets do not favor consultants that have established relationships with sponsors and possible insights into expected project costs).
- Many public-agency personnel and consultants agree that including a dollar amount in RFPs results in better and more comparable proposals.
- Other agency personnel stated that non-fixed price projects that are clearly defined are preferable from an evaluation standpoint.
- When budgetary specifications are not included in the RFP, sufficient detail and guidance should be provided to enable contractors to cost-out projects and minimize their risk.

- Allow enough time after RFP comes out for consultants to put together a quality response (2 weeks is not enough!) A minimum of 30 days is more appropriate, but the response time should depend on scope of project.
- RFPs should not be released in August or December as this can lead to rushed responses, unrealistic proposals, and poor quality data.
- Allow time after question and answer period for consultants to prepare/revise proposals (e.g., Q&A 1 week after RFP released, answers due back from client by end of second week).
- Allow enough time in RFPs for adequate pilot testing to ensure that the major level of effort (data collection) is not modified while the survey has already begun.
- If there are special target populations (e.g., minority population), allow budget and time for sufficient community outreach. Engage in-house public outreach staff to be part of the project team to help brand and communicate the survey.
- Advertise RFPs widely (e.g., TMIP, distribution lists).
- On contracts of \$150,000 or less, there may not be enough budget to satisfy requirement for Disadvantaged Business Enterprise (this may not be the case with federally funded projects).
- Use federal and state collected data in the local process as opposed to designing surveys that have little or no connectivity to existing surveys. Example of NHTS 2009 in development of supplementary household surveys was presented.

Questions 2 and 3: How do we communicate to the broader travel survey community that these changes would be beneficial and how do we communicate future recommendations?

The group discussed the following issues regarding communication:

- For clients with limited time, knowledge or expertise in conducting surveys, the online Travel Survey Manual provides some RFP guidance, posting of previously released RFPs to a website along with a summary table of the RFPs posted describing their attributes for easy reference, outreach by FHWA is another option; workshops, webinars and outreach at the state level are other options.

Question 4: How do we track progress in this area?

The group discussed the following recommendations of how to track progress:

- Presentation of RFP development methods and findings at TRB and other venues.
- Creation of RFP peer review group to highlight and share successful RFPs.
- Soliciting RFP scoring or feedback from private sector interests and posted to a centralized website.

The group concluded the session by reporting their findings to the entire symposium during the report out session.

Communicating and Sustaining Travel Survey Programs

Discussion Group 7 Topic: Communicating, and Sustaining Travel Survey Programs

The following are the moderators, discussion questions, and summary of findings for Discussion Group 7.

Discussion Group 7 Moderators:

Becky Knudson, Oregon DOT; Cheryl Stecher, Franklin Hill Group

Discussion Group 7 Questions:

1. What are the main approaches to funding surveys now?
2. What are current obstacles to getting funding for surveys?
3. How can we overcome these obstacles?
4. How can we better communicate the value of these surveys?

Discussion Group 7 Summary of Findings:

Question 1: What are the main approaches to funding surveys now?

The group discussed the following approaches for funding surveys:

- Developing mechanisms to accommodate partnerships.
 - MPO only, use core survey and allow add-ons from other participants.
 - Some states do entire funding, but work together on use of data by other agencies.
- Developing partnerships (state, county, and MPOs pooling resources); identify need and conduct outreach to gain support.
 - Establish internal champion – can have funds for core survey, then have add-ons to get larger sample size.
 - Multi-state partners.
 - Primary champion.
 - Flexibility to serve unique needs by region.
- Key to partnerships.
- Understand unique needs of areas.
 - Relate data to mandate.
 - Pool funds with FHWA (avoid match requirement).

Question 2: What are the current obstacles to getting funding for surveys?

The group discussed the following funding obstacles:

- Administrative – applying for large lump sums of funds, gaining approval to save for future expenditures and retain approval for use of funds.
- Inclusion in funding allocation decision making/survey planning and execution.
- Unclear planning process related to role the data plays.
- Finding common ground across data users to show need is greater than people understand.
- Acknowledge different needs and describing how different needs will be met with survey results.

- Unwillingness to compromise with funding decision makers.
- Inadequate demonstration of value in the product/data.
- Long-range planning approach to data needs – people are distracted by current conditions; when economy is weak, it is important to remind decision makers the economy will recover and data will be needed.

Question 3: How can we overcome these obstacles?

The group discussed the following strategies for overcoming previously mentioned obstacles:

- Make the data purposeful.
 - Make use of the data sustainable; create a reliable and informative source that suits needs.
 - Develop statistical techniques to reduce cost by smarter design, sampling, and augmenting existing and older data.
 - Fundamental “core” approach with add-ons, new and older refined data.
 - Blending old “lower” quality data with small set of high quality data.
 - Show value of using “good” tools and risk associated with use of “poor” tools.

Question 4: How can we better communicate the value of these surveys?

The group discussed the following communication strategies:

- Show value of tools with these data, relate sense of error using national data, outdated data, poor sources of data, etc.
 - Explain value of new/different data.
 - Without data can't inform decisions of current day.
 - Need to capture emerging activity; demonstrate risk of not understanding such patterns in timely manner.
 - Provide survey role to illustrate context, behavior patterns.
 - Address survey role to demonstrate issues people care about.
 - Use sales approach: invest in good tools and methods to show the value of these data; market the idea effectively, don't assume decision makers will see the value of the data.
 - Identify public need – acknowledge the cost is high, but counter with estimated value and costs avoided using these data.
 - Translate into technical need, relate it to federal requirements – upcoming performance measure push.
- Identify loss and risk without the data.
 - Support informed choice.
 - Provide regional context.
 - Remind people what models are designed to do.
 - Develop enhanced/higher quality communication skills/teaching.

Conference Closing Remarks

Moderator: Stacey Bricka, Texas A&M Transportation Institute

Conference participants who attended the 1995 symposium on household travel surveys were asked to provide some closing remarks about what they remember from the 1995 symposium, how the topics discussed at the 1995 symposium, and this symposium were similar or different, and what advice they have as the travel survey community moves forward.

Bob Griffiths, MWCOG, provided the following closing remarks:

I remember having heated discussions about mail surveys versus RDD CATI surveys at the 1995 symposium. Now we have cell phones, so maybe an address based sample using mailing lists is not a bad idea. I hope that you had some good discussions and listened with an open mind. As I leave this conference, I do not think that single day surveys are going to make it anymore. We will be looking at 14 days or longer using GPS. We need to take a multi-layered approach. It is important to reach respondents in different ways and consider issues of data fusion.

Nancy McGuckin, Travel Behavior Associates, provided the following closing remarks:

In 1995, I agreed with Elaine Murakami that the internet would never be used for commercial purposes. Obviously, that was not the case. We are always not seeing what is right in front of us. The internet is changing the way we approach data, what data we have, the way we understand data, and the way we travel.

Susan Liss, Consultant, provided the following closing remarks:

This symposium revitalized my interest in travel surveys. Some of us are starting to use technology that is on the cutting edge. It is wonderful that we are getting new ways of doing things. As a caution, we need to keep some elements of the old way of surveying so we can compare the new data with the old data. We are tracking how travel changes as the world changes so remember issues of comparability and keep half an eye on the past.

Cheryl Stecher, Franklin Hill Group provided the following closing remarks:

A lot of exiting things have emerged in the last 20 years. Activity based models have emerged and there is a lot more technology used to get data. We are on the cusp of big data. How are we going to use these data? Can we even call household surveys of the future household surveys? Despite these changes, a lot has not changed. The respondent experience is still a tough issue. We still have not made it really easy for our respondents; we just keep adding elements to surveys. We need to drill down into some very targeted audiences.

Keith Lawton, Consultant, provided the following closing remarks:

In 1995, we were discussing multi-day surveys. Interestingly, in the 1950s or early 1960s somebody completed a 30 day paper survey. In 1995, we also talked about panels but we did not realize the impact of day-to-day variation. We also did not talk about funding. We did talk about stated preference and stated choice. In 1995, we did not have useable GPS and smartphones had not been invented. The more passive we can get the more we can reduce the burden on respondents and the more we can think about moving to panels, which would allow us to see what people do when prices change (i.e., if there is an economic shock, etc.). We need to consider how we should invest in a way that is robust in variable

possible futures. We are also being forced to change our methodologies; CATI does not work as well any more, and RDD does not work at all.

Elaine Murakami, FHWA, provided the following closing remarks:

There is good news and there is bad news. The good news is that using GPS has become almost standard practice. I love using new technology in conducting travel survey research. Smartphones in research are very important and provide opportunities for conducting longer period surveys. Among the bad news is unit non-response. This issue is worse than it was when we talked about it in 1995. We need to think of respondents as our customers. It should be a priority to reduce the burden on respondents and make it more pertinent to their needs. Transportation is an important part of people's daily lives as it amounts to the second highest household expenditure and it is a very time consuming activity.

Stacey Bricka, Texas A&M Transportation Institute, closed the conference by highlighting the following three takeaways from the symposium:

1. Remember the respondents. As you design surveys, is the result something you would participate in or would you do it differently?
2. Stay outside the box in:
 - Acquiring funding.
 - Creating inspirational new surveys of the future.
 - Using new technologies.
 - Collaborating with tangent communities in sharing survey risk.
 - Live in the land of "why not?" and pursue possibilities.
3. Between now and whenever we convene next, what will your story be? What have you learned at this symposium and what difference will it make to the community?

The participants and presenters of the 2012 Household Travel Survey Symposium were all thanked for their time and input.

SECTION 3: APPENDICES

A – Symposium Program

B – List of Attendees



Special Thanks to Our Gold Sponsors:



TECHNOLOGY FOR A MOBILE WORLD



Special Thanks Also to Our In-Kind Sponsor:



Special Thanks Also to Our Oversight Panel:

Oversight Panel Members:

Elaine Murakami
Federal Highway Administration, Chair

Arash Mirzaei
North Central Texas Council of Governments

Becky Knudson
Oregon Department of Transportation

Karen Faussett
Michigan Department of Transportation

Kouros Mohammadian
University of Illinois at Chicago

Conference Co-chairs:

Stacey Bricka
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HOUSEHOLD TRAVEL SURVEY SYMPOSIUM



MOVING FROM TRADITION TO PRACTICAL INNOVATION



Sheraton Dallas Hotel
Dallas, Texas | November 8–9, 2012



2012 HOUSEHOLD TRAVEL SURVEY SYMPOSIUM

Thursday, November 8, 2012

- 8:00 a.m. – 9:30 a.m. **Poster Session** (Breakfast Available)
Majestic 1
- 9:30 a.m. – 10:15 a.m. **Plenary Session #1**
Majestic 4-5
Stacey Bricka, Texas A&M Transportation Institute (TTI),
Conference Co-chair
Welcome
Michael Morris and Arash Mirzaei,
North Central Texas Council of Governments (NCTCOG)
Keynote Speaker
Kermit Wies, Chicago Metropolitan Agency for Planning
- 10:30 a.m. – Noon **Discussion Group 1: Survey Methods**
Majestic 4-5
Moderators:
Ed Hard, TTI
Chris Tatham, ETC Institute
- 10:30 a.m. – Noon **Discussion Group 2: Sample and Hard-to-Reach Populations**
Majestic 3
Moderators:
Margaret Petrella, RITA, Volpe Center
Jason Minser, Abt SRBI
Mia Zmud, NuStats
- 10:30 a.m. – Noon **Discussion Group 3: Data Uses and Data Needs**
Majestic 8
Moderators:
Keith Lawton, Consultant
Krishnan Viswanathan, CDM Smith
- Noon – 1:00 p.m. **Lunch**
Majestic 1
- 1:15 p.m. – 2:45 p.m. **Plenary Session #2**
Majestic 4-5
- 3:00 p.m. – 4:30 p.m. **Discussion Group 4a: Surveys of the Future**
Majestic 4-5
Moderators:
Kouros Mohammadian, University of Illinois at Chicago
Jean Wolf, GeoStats

Thursday, November 8, 2012 (continued)

- 3:00 p.m. – 4:30 p.m. **Discussion Group 4b: Surveys of the Future**
Majestic 3
Moderators:
Elaine Murakami, Federal Highway Administration
Timothy Michalowski, Abt SRBI
- 3:00 p.m. – 4:30 p.m. **Discussion Group 4c: Surveys of the Future**
Majestic 8
Moderators:
Karen Faussett, Michigan Department of Transportation
Sandra Rodriguez, NuStats
- 4:30 p.m. – 5:30 p.m. **Plenary Session #3**
Majestic 4-5
- 6:30 p.m. **Dine Around Dinner (on Your Own)**
The dine-around provides an opportunity to go out for a casual dinner with other conference attendees and continue your discussions. Sign up at the registration desk by 1 p.m. on Thursday, and then meet your group in the main lobby at 6:30 p.m. to walk to the nearby restaurants.

Friday, November 9, 2012

- 7:00 a.m. – 8:00 a.m. **Continental Breakfast**
Majestic Preconvene
- 8:00 a.m. – 9:00 a.m. **Plenary Session #4**
Moving Forward: Turning Discussions into Realities
Majestic 4-5
- 9:00 a.m. – 10:15 a.m. **Discussion Group 5: Research Priorities and How to Fund Them**
Majestic 4-5
Moderators:
Guy Rousseau, Atlanta Regional Commission
Susan Swain, Westat
- 9:00 a.m. – 10:15 a.m. **Discussion Group 6: Writing RFPs That Reflect Symposium Findings**
Majestic 3
Moderators:
Arash Mizraei, NCTCOG
Jesse Casas, Westat
- 9:00 a.m. – 10:15 a.m. **Discussion Group 7: Building, Communicating and Sustaining Travel Survey Programs**
Majestic 8
Moderators:
Becky Knudson, Oregon Department of Transportation
Cheryl Stecher, Franklin Hill Group
- 10:30 a.m. – Noon **Plenary Session #5**
Majestic 4-5

Name	Title	Company
Aaron Hekele	Project Manager	ETC Institute
Adella Santos	NHTS Program Manager	FHWA
Arash Mirzaei	Modeling Manager	NCTCOG
Arun Kuppam	Principal	Cambridge Systematics
Bart Rudolph	Transportation Planner	State of Alaska, Dept of Transportation
Becky Knudson	Senior Transportation Economist	Oregon DOT
Behruz Paschai	Transportation System Modeling Manager	NCTCOG
Bill King	Sales	AirSage
Bob Lordo	Manager	Battelle
Bradley Lane	Assistant Professor	The University of Texas at El Paso
Bruce Uphaus	Traffic Analyst	TxDOT
Charlie Hall	Transportation Analyst	TxDOT
Cheryl Stecher	President	Franklin Hill Group
Chris Simek	Research Specialist	TTI
Chris Tatham	Vice President	ETC Institute
Cindy Burke	Director, Applied Research Divison	SANDAG
Debbie Spillane	Asst. Transportation Researcher	TTI
Don Mayle	Transportation Planner	Michigan Department of Transportation
Ed Hard	Program Manager	TTI
Elaine Murakami	Planner	FHWA
Elizabeth Greene	Senior Consultant	Resource Systems Group, Inc. (RSG)
Eric Wood	Vehicle Systems Engineer	National Renewable Energy Laboratory
Greg Macfarlane	Graduate Research Assistant	Georgia Institute of Technology
Gustavo Baez	President	Baez Consulting
Guy Rousseau	Travel Surveys & Transportation Model Development Manager	Atlanta Regional Commission
James Kerrigan	Senior Analyst	Resource Systems Group, Inc. (RSG)
Janie Temple	Transportation Analysis Branch Manager	TxDOT
Jason Minser	Senior Analyst	Abt SRBI
Jd Allen	Vice President	Alliance Transportation Group
Jean Wolf	President	Geostats
Jennifer Anderson	Traffic Data & Forecasting Manager	State of Alaska DOT & PF
Jerry Everett	Research Director	University of Tennessee
Jesse Casas	Senior Research Associate	Westat
Jonathan Van Matre	Manager, IT & Business Processing	NuStats
Karen Faussett	Stwd Model Specialist	Michigan DOT
Kathleen Yu	Senior Transportation System Modeler	NCTCOG
Keith Lawton	Principal	Keith Lawton Consulting
Kermit Wies	Deputy Executive Director	Chicago Metropolitan Agency for Planning
Kouros Mohammadian	Associate Professor	University of Illinois at Chicago
Krishnan Viswanathan	Project Manager	CDM Smith
Lalit Patel	Transportation/Traffic Engineer	Bi-State Regional Commission
Laurie Wargelin	Vice President	Abt SRBI
Lisa Aultman-Hall	Professor	University of Vermont
Lisa Larsen	Graduate Assistant Researcher	TTI
Liyang Feng	Coordinator, Transportation Modeling	SEMCOG
Lucia Lanini	Research Associate	NuStats, LLC
Marcelo Oliveira	Software Director	Geostats
Margaret Petrella	Social Scientist	The Volpe National Transportation Systems Center

Mark Freedman	Vice President	Westat
Mark Ojah	Researcher	TTI
Martin Kunzmann	President	NuStats, LLC
Mia Zmud	Director Research, Business Development, Marketing	NuStats
Michael Medina	Assistant Director	El Paso MPO
Mike Heath	President	Alliance Transportation Group
Nancy McGuckin	Consultant	Travel Behavior Analyst
Nick Wood	Assistant Transportation Researcher	TTI
Orion Stewart	Research Scientist	University of Washington
Phil Winters	Senior Research Associate	CUTR/USF
Robert Griffiths	Director of Technical Services	Metro Wash COG
Salvador Gonzalez	Transportation Planning & Program Manager	El Paso MPO
Sandra Rodriguez	IT/BP Director	NuStats
Sarah Griffith	GIS Technician	NuStats
Shane Lebouthillier	Transportation Engineer	City of Calgary
Shimon Israel	Transportation Planner	Metropolitan Transportation Commission
Stacey Bricka	Research Scientist	TTI
Susan Horst	Community Transportation Program Manager	Whatcom Council of Governments
Susan Liss	Consultant	NHTS Team
Susan Swain	Senior Study Director	Westat
Terry Corkery	Transportation Planner	Department of Transportation
Timothy Michalowski	GIS Director	Abt SRBI, Inc.
Tina Geiselbrecht	Associate Research Scientist	TTI
Vladimir Livshits	Program Manager	Maricopa Association of Governments
Xiahong Ju	Senior Transportation Analyst	H-GAC
Yongqiang Wu	Senior Transportation Engineer	Gannett Fleming, Inc.