

**OREGON MODELING STEERING COMMITTEE
LONGITUDINAL PANEL SURVEY
EXPERT PANEL WORKSHOP
Portland, Oregon
May 29-31, 2002**

INTRODUCTION

The last Oregon survey was conducted in 1994 as a cross-sectional revealed preference style survey. The physical area covered included the Willamette Valley and Southern Oregon. As the Oregon Modeling Steering Committee (OMSC) prepares to update this survey information, it also intends to modify the survey style and consider a longitudinal panel survey (LPS) in fiscal year 2003-04.

There is solid evidence that panel data can significantly enhance the ability to understand and forecast travel behavior. Panel survey techniques are one of the few methods available to the analyst to understand how traveler behavior is influenced by information acquisition, experimentation, and learning. It provides an opportunity to identify behavioral change over time. In effect, the panel survey provides information to understand cause and effect relationships and the process of change.

There are many issues to consider before conducting a longitudinal panel survey. Detailed consideration must be given to the survey content, design, data capture methods, and the intended use of the data. Many of the issues require the expertise of survey professionals. At the same time, it is important to understand state-of-the-art modeling techniques to understand how collected survey data can be used.

To provide this expertise, the OMSC assembled a panel of experts to discuss these complex issues and to provide guidance on development and implementation of the survey. A white paper was prepared to serve as a guide for this several day expert panel discussion and was provided to participants prior to the meeting. The OMSC will use the comments and recommendations of the expert panel members as guidelines to determine whether a longitudinal panel survey is appropriate for Oregon and then for development of the survey work program if it proceeds

ATTENDANCE

The expert panel work session was held May 29-30, 2002, from 8:30 a.m.-5.00 p.m. at the DoubleTree Inn, Lloyd Center, Portland. A half-day session was held at the Portland Airport on May 31, 2002 from 8:30 a.m. to 12:30 p.m.

Expert Panel Members

Keith Lawton	Metro, Portland, OR
Elaine Murakami	Federal Highway Administration, Seattle, WA
Kostas Goulias	Penn State University, State College, PA
Mark Bradley	Consultant, San Francisco, CA
Tom Adler	Resource Systems Group Inc., VT
Tom Golob	University of California, Irvine, CA
Bob Griffiths	Metro Washington Council of Govts, Washington, DC
Carlos Arce	NuStats Survey Firm, Austin, TX
Rick Donnelly	Parsons Brinckerhoff, Albuquerque, NM
Martin Lee-Gosselin	Laval University, Quebec, Canada

Oregon Modeling Steering Committee

Dick Walker	Metro, Portland, OR
Mike Jaffe	Mid-Willamette Valley Council of Govts, Salem, OR
Bud Reiff	Lane Council of Governments, Eugene, OR
Craig Anderson	Rogue Valley Council of Governments, Medford, OR
Richard Bjelland	OR Housing & Community Services, Salem, OR
Shinwon Kim	SW WA Regional Transport. Council, Vancouver, WA

Staff/Guests

Kyung-Hwa Kim	Metro, Portland, OR
Mike Gillett	ODOT/Transport. Planning Analysis Unit, Salem, OR
Rob Bertini	Portland State University, Portland, OR
Jennifer Dill	Portland State University, Portland, OR
Michal Wert	MW Consulting, Newberg, OR

WORKSHOP OVERVIEW

Following self-introductions, Keith Lawton reviewed the purpose of the workshop, anticipated products, and the agenda format. A copy of the agenda is attached to these meeting notes. The following notes follow the conversation and generally follow the topical areas of the agenda.

DAY 1

Lawton: Reviewed the analytical needs for the survey. Panel members clarified and added to needs:

1. Housing location choice.
2. Urban design environment and its impact on travel choices.
3. Auto acquisition and disposition - cross-sectional ownership does not get to why.
4. Household transition effects (life cycle) - do we want a retrospective?
5. Household/personal income effects – Identify how disposable income and consumption behavior impact travel and location choices.

6. Technology profile - Identify how location and travel decisions are affected by computers, e-mail, cell phones, etc.
7. Dwelling unit information - Identify the changes in type chosen (single-family vs. multi-family, suburban vs. urban, etc.) as it relates to income and lifecycle.
8. Seasonal travel differences – Identify how travel characteristics change between summer, winter, and other seasons. May affect air quality considerations. Aggregate data is better than intra-household (e.g. trying to interview the same household in different seasons is complicated).
9. Attitudes and values – Determine how attitudes and value systems influence travel choices. Stated response question - variance in behavior linked to attitudes.
10. Activity and travel choices – Determine choice patterns for activities. Identify travel tours, trips, destination, mode choice patterns, in-home activities.
11. Work place choice (other side of housing location choice).
12. In/out migration.
13. What are the constraints in decision-making (e.g. lack of full information in making choices)?

Golob: When will this survey be done and how will it be funded? How much money is available to do the survey?

Lawton: Do not want to establish a budget, but rather talk about what we want to do and then how much it will cost. The last Metro survey cost \$1.25M and this is about what it would cost to do the survey every 7-8 years. Can we be more cost-effective with an LPS?

Wert: The OMSC is composed of 6 state agencies and 5 metropolitan planning organizations (MPOs). Depending on how well a survey can meet multiple needs, there could be a broader base available for funding.

Lee-Gosselin: Don't just focus on urban area. Also need the statewide destination information for urban travelers.

Jaffe: Important considerations – urban design environment, type of housing needs, life-cycle effects.

Goulias: Is non-survey data available in Oregon (e.g. employment, housing value)? Lawton: Information on where people work is available from State Unemployment Tables. In the Metro area, do a lot of Yellow Pages work. Do not have income or occupation data. Do not do establishment surveys to determine behavior of employees but do have list of establishments. Have dollar value of residences from tax records. Have age by parcel. Have a lot of information geographically.

Golob: On-going traffic count information needed. Walker: This is a weakness. Many counts are taken for a day or two so do not have seasonal variation from month or year. Have no commercial vehicle data. Day-to-day commercial and delivery data does not exist. Have data on higher order freight. Have lots of parking data.

Bertini: Bus stop information is geocoded for database. Will have web interface for freeways in 2002-03. Have loop detectors on freeway and can not do classifications but are trying to obtain classifications from videos. All buses have GPS and are experimenting to see how GPS can be used in an archive or a real-time way.

Lawton: For the 1994 survey, we asked for in- and out-of-home activities. The number of walking trips doubled over past surveys. We got more reporting by respondents by focusing on non-auto travel, not just transit. Question of how to pull trips apart to properly allocate to non-auto travel mode.

Golob: Have had problem identifying "what is a trip?" Network data – do you have reliable distance info? Distance and time reporting is usually not good. Lawton: Yes – detailed emme/2 network and all-streets network for TRANSIMS. Speed information on local streets does not change much during day-to-day but it does change on freeways because it is driven by congestion.

Goulias: Need exact distance/pattern of trip that was made – not just minimum path. Is the use of GPS on a subset of travelers possible? Rather than getting information for everyone, can do a main survey that takes certain information and then do a more in-depth one that defines errors to feed back into main data. Bradley: It is being done in Atlanta. Arce: In California, GPS is being used to identify under-reported trips.

S. Kim: What are the advantages of panels? Is a 5-year duration enough to obtain meaningful information from a panel? Golob: Yes.

Golob: Panels age so need to keep getting new panelists to reflect how population changes over time. Data needs must be considered when selecting the methodology. Do not do choice-based panel.

Goulias: Panels are useful to measure policy effects. A person is given incentives to use public transportation. At first they do but do they maintain this response? With LPS, we can determine whether this policy had the desired long-term effect. Question is whether Oregon wants this type of information. Cross-section surveys work well for some things.

K. Kim: Cross-sectional surveys (CSS) give lots of data. Panels give time effects but smaller samples. Perhaps Oregon needs an LPS but also needs a cross-sectional survey from time-to-time to supplement information.

Goulias: LPS is a control to see if the CSS is of value or if shifts have occurred that policy-makers should be aware of.

Reiff: Before and after studies are the most common panel. The trouble is they are usually stopped too soon. Golob: Need at least two waves of "before" and "after". The Dutch panel found that even though bike and ped are strong in the Netherlands, they are volatile. Learned the extent to which good public transit delayed purchase of cars. Saw transition of changes that was useful to policy-makers.

Goulias: When a person moves, need to know how long it takes for them to learn the new characteristics of the new place. A person from the suburbs may not know how to use public transportation in an urban area. Lawton: Perhaps they already knew the characteristics and it served as a motivation for the move.

Bjelland: The demographics in Oregon are changing significantly. In some Oregon counties, 100 percent of growth was Hispanic-Latino from 1980-90. How does this growth affect transportation choices? What weighting variables should be used? Lawton: There are changes between the choice patterns of first and second-generation migration populations. Focused on income before but there are other characteristics, i.e., Hispanic-Latino tend to buy housing at a younger age than some other populations.

Break

Lawton: Described the TRANSIMS method of developing synthetic households and activity patterns. Could build models of transition as a response to changes instead of changing the base. Can deal specifically with things that change over time or to test different policies, such as road pricing. Do we need an LPS or will a CSS work?

Golob: Is it necessary to replace the old models and surveys? Maybe only updates are needed.

Donnelly: Provided overview of the ODOT Transportation Land Use Modeling Improvement Program (TLUMIP) model. Building an integrated land use/transportation/economic model for Oregon. TLUMIP is statewide in orientation but Portland is the largest population base. Making a distinction between building the base and then building a transition-based model. Surveys should address transition influences.

Learning a lot about the dynamics of the model in its 2nd generation. Elements of the 2nd generation model: HA (household activity model), PI (Production allocations and Interactions), LD (land development model), PT (passenger transport model), CT (commercial transport model), and TS (transport supply model). Noted that PI and HA are transition models. Working now to walk model through time. Want to see policy effect and start to measure it. PT-CT-TS is tied to ED-PI-LD-HA and walks through time - April of each year was selected because had most reliable data for April. Relying on input-output model to feed information into next steps. Do not have data to do anything more than aggregate.

Bradley: Daily variation is an issue in surveys. LPS is good for land use and auto ownership models. In a cross-sectional survey, how much faith do we have in retrospective data? LPS captures it better. LPS is not needed for every model component, but useful in some. Have been talking about dynamic models that have never been done and there are reasons why they have not been done. Models predict changes and LPS is good to see if the model captures what the people will do over time.

Lawton: Land use changes are important. They influence transport decisions. Housing choices are very important. Goulias: Land use changes have an impact on destination choice.

Golob: How much faith do we have in retrospective data? It is easy to ask people where they lived before, when they moved, etc. It is hard to get the exogenous variable data for the past (e.g. land use characteristics, income, employment characteristics, transport characteristics, etc.). With an LPS, we have base data, but we continue to collect into the future.

Lee-Gosselin: We are doing a better job of collecting this data.

Goulias: If we assume employment by industry today and create synthetic schedules to project year after year, why not go backwards to create historical data? Bradley: Issue is why did people make the decisions to get to where they are today? Goulias: Ask the question to validate using the same process for validating in TRANSIMS.

Bradley: Input data is already an estimate and if you go back in time, it gets more estimated. Goulias: The question is what purpose will be served by collecting historical data? Bradley: Reflects rate of change between short- and long-term. Are decisions made a year ago still affecting behavior now?

Lee-Gosselin: Feminization of work force and affect that has on household location has benefited by retrospective. Donnelly: Useful for survey definition as much as for model development. Look at what we should have been collecting.

Bradley: Integrated land use models are the wave of the future. LPS allows us to do repeated stated preference surveys to get value of time and other data.

Golob: An advantage of LPS is we can use a smaller sample size. The user of the data can only look at the changes and the distribution around the mean instead of comparing to sets of data. Can understand relationships of car ownership and travel by what types of activities are available in what locations - LPS tells you motivational triggers. This could not be done with cross-sectional surveys. Depends on what you want to do - if you want to know what motivates people to move downtown and what makes them walk more or do e-banking, LPS will be more cost-effective in terms of what we get from a sample. One problem is that surveys that reflect interest in a specific corridor or area lose data when a person moves from the area of interest.

Lawton: Is smaller LPS size due to the fact that it is more efficient or because that was all the money available? It seems like it would be better to institutionalize the process as a budget line item every year rather than have one big budget expense every 7-8 years.

Lawton: Can one aggregate data from multiple waves (e.g. triplets)? Golob: Consider wave pair or wave triplet data set. Goulias: Consider sets of 3-year survey group, a different 3-year survey group, 4-year survey group - mix time frames. Panel size gets bigger as sensitivity increases. Golob: Do not just survey "stayers" - need to make LPS representative of the region. Bradley: May have to give up year round data. Just focus on one time per year in order to get efficiency benefits.

Goulias: The Seattle data is only now just becoming useful. It has been underway for 12 years.

Bradley: Favor stated preference surveys, where people are put in hypothetical situations and note the choices. Non-discrete choice questions arise and it is nice to have a set survey process to use. Having a sample and mechanism readily available is useful.

Alder: Consider a survey café - add-ons to the original purpose of the panel. Value by having a continuous panel. Have had an air traveler LPS for the past three years and add on here and there.

Goulias: In panel surveys, the survey team becomes better due to the repetition. The process becomes more efficient and accurate. The agency develops a relationship with a consultant and both develop an on-going relationship with the LPS participants. These long-term relationships are valuable because everyone is trained.

Bjelland: OHCS gets requests from other agencies to add questions to surveys. Benefits both - it costs others more to do their own survey and helps OHCS with cost.

Griffiths: Be careful of going "hat-in-hand" for money - it may cost more money to raise the money. Best to have commitment of funding from the beginning. Be careful of an omnibus survey, adding questions simply because someone will pay for it especially if questions do not relate to the original survey intent. As the survey gets longer, respondent fatigue may enter in. To maintain continuity, it is important to have a staff person assigned to manage the survey and to maintain continuity.

Golob: There is a panel going on in Britain. The funding is from multiple sources (health, housing, etc.).

Lunch

Donnelly: Everyone doing land use models are just starting the modeling right now and there are few people in the country who have a good knowledge base for the models. What is important to answer with these models? If we have no questions that conventional surveys cannot answer, this discussion is not necessary.

Golob: Distributed paper *Structural Equation Modeling for Travel Behavior Research*. There are techniques that transportation planners have not used. Structural equation modeling may be adequate for many questions that have causality problems or questions. Panel data is not foolproof but might be able to do strength of causality. Lag effect - results build up over time, does not happen immediately. Found that future income had a lot of effect on car mobility. Have looked at this to evaluate a project. Need at least two waves of panel before and two waves after to account for response to the event. Structural equations are a way to measure endogenous against exogenous variables. This is more of a market research tool to determine to what extent something affects something else. Trying to separate causality from correlation. Can test hypotheses once a base model is established.

Jaffe: Are the results from a panel survey good enough to measure 20-30 year effects? Goulias: Yes, but focus analysis on the cohorts - age, period effects (recession/depression). Forecast will be more precise with LPS in long-term.

Lawton: Problem - cannot separate out different urban design elements, i.e., number of intersections within so many miles, availability of transit, etc. For example, intersection density vs. mixed-use vs. grade - which of these cause less reliance on autos. Important to know why people do what they do to make better policy decisions. The variables are very correlated - we cannot separate

out how much occurs because of one variable such as transit accessibility or sidewalk accessibility. There are things that cannot be addressed by cross-section survey data, such as did they move downtown to get rid of a car or did they get rid of a car because they moved downtown?

Glob: Total vehicle miles traveled by car can be measured easily. If we want to know if someone is using a certain road or link in the network, we need something more.

Goulias: It comes down to a sampling issue. Look before and after and hold all variables constant except one, i.e., walking before and after a transit line opens. Do places exist that have the characteristics separate? Lawton: Hard to do before and after in some areas. Developers look at where transportation systems will be built and build their development without the improvements in place.

Bradley: If continuous panel data is being collected, then the network data needs to be continually updated. Large changes would be easier to define than small changes.

Goulias: Weather is an important element to note during surveys. More rain may mean fewer bikes and more cars.

Adler: Have used the structural equation model for market research. It estimates a lot of information. An approach is now available for non-mathematicians. Market research is very interested in causality.

Goulias: When analyzing data, the aggregate may appear to be stable. However, the cohorts may be seeing behavior change. Viewpoints change monthly. Attitudes are important – they correlate with behavioral choices.

Golob: Panels are important when evaluating telecommunication technology. Lawton: Could lead to bigger sample sizes.

K. Kim: Can change really be measured? How much of it is measurement error? How do we determine whether a distortion in a year is due to a change or just a distortion? Golob: There are biases and errors that come into play. In an LPS, need to determine in each wave where there are anomalies.

Arce: Data collection or institutional errors are not as large a problem because can be detected. Responders can develop their own biases and these may go undetected. Need to guard against trained panelists - build redundant questions to cross check. Also, panelists see same question/answer over time and introduce errors.

Murakami: The refusal rate in recruitment is higher than that found in attrition. In a Denver experiment, a \$5 enticement seemed to work well to minimize refusal rates. Goulias: Initial non-response is the big problem.

K. Kim: Does panel give enough samples for bike and transit trips? (to be discussed later).

Arce: Question to modelers: the nature of households is changing to include multiple families in a dwelling. As a researcher, can make correction because collecting the data. How do we deal with people doubling up in a household in a model? This is a big problem in Washington DC, Atlanta and Los Angeles.

Goulias: In university towns, cannot pick up multiple families. Students may live in one house but for the Census say they live with their parents in a different location. Murakami: Large households drop out quickly.

Arce: Attrition – if known – can be useful (e.g. they are likely high trip makers).

Murakami: Maybe we should be doing person-based surveys – not households.

Griffiths: Survey must be clean for modelers to effectively use it. In a Request for Proposal (RFP), do not base cost on completed households. Otherwise, contractor will give up on hard ones (perhaps the most mobile households).

Lawton: Do we really need household interactions? Goulias: A complete household is important. How could you recruit random persons? Murakami: Capture the household, then select by birthday, age, sex, etc. Griffiths: Cluster samples could be used. Arce: This is currently being done. You can sample just persons (e.g. political surveys).

Golob: Will data need to support the 4-step model? Lawton: Possibly. Is creating a model that measures response to change the way to go? Are there new ways of doing things?

Bertini: As part of a state project on road pricing, GPS units are being installed on cars. What if all cars in 10 years had GPS and we were pricing using this system? Knowing where cars are going is different than where people are going, but it could be useful to modelers.

Lee-Gosselin: Survey data is being heavily post processed using data collected by passive means (Britain). This supports GPS usage. Reiff: Atlanta is using handheld GPS and auto GPS. Arce: 3000 households were provided backpacks with antenna and batteries to record information for a 2-day duration.

S. Kim: Traffic count and speed data will be much greater if we have all the car data. Lawton: This gives much better simulation of what is happening on the roadway, but we do not know why. Does not answer policy questions.

Break

Lawton: Oregon does not currently plan to develop any models that have unique data needs that would require an LPS per se. For policy issues, there is a strong argument for LPS for response to policy actions or if we want models to respond to policy changes that we have brought into them. If we think there are good results from an LPS, are there down sides to doing a panel?

Griffiths: The Washington DC panel started for policy reasons – not model building. Questions were raised by the Board every year and did not have data available to answer questions. Also took advantage of increased funding and a continuous source of funding.

In the future, will look at LPS data to build models, but have not done that yet. Should start data collection now so that it is available when needed. The modelers looked at LPS data for what percentage of population is taking advantage of transit. LPS is 2500 households regionwide. They believe it is not a large enough sample for geographic coverage. Entire work program is \$7M.

Downside - taking survey resources and making a commitment to spend them out over time. To do that will have a smaller sample than would have otherwise so can not have same geographic specificity as had with other models.

A year round staff commitment is needed to maintain an LPS. Do a wave every spring, early May to mid-June for consistency for network characteristics. Need a staff person to be engaged year around to keep contact with survey participants.

Forty percent of panelists are lost each year due to attrition. The Washington DC area is highly mobile, especially for younger households. Have a good spread so can do comparisons between old panel and new households that come in. The weighting becomes difficult due to attrition. Sometimes feel that a continuous cross-sectional survey would be better because of the high attrition rate.

Have addressed some policy issues - transit ridership and changes in transit ridership. Tracking well - as changes occur can talk about why change occurred and would not have been able to do this without LPS. Go back every spring and change a few questions - open or attitudinal questions. Customer satisfaction was a question last year. Basic questions have stayed the same. Use of high occupancy vehicle (HOV) lanes was an added question. Would look hard

whether to use LPS for modeling. However, if we want policy information and evidence to support, has value.

Need to beware of "questionnaire creep" - cannot allow questionnaire to get too large. Cannot keep adding questions - add a "question du jour" but drop it for next survey.

If we could do over again, would think about repeated cross-sectionals because feel more comfortable with cross-sectionals than with waiting for LPS. Can get results back quicker.

Twenty percent of the sample has been on the panel throughout its duration. Existing panel members seem to have lower trip rates than new people. Murakami: Distance has not increased but time has.

Griffiths: Home based-to-work commuting trips have decreased. Could get better information on home-to-work. Travel in terms of total daily travel in the region is less and trip-sharing is increased. Capture one day each year. Have not asked e-type questions but have asked "if you do not make a commuting trip are you working at home?" Ask questions about number of phone lines but do not ask about other technology in the household. Randomized within the work week. This year asked a weekend question to respond to a question raised by the Board on weekend use. This spring is the first weekend/holiday data.

Interview all persons in the household age 5 and older. Data from 5-14 year olds is collected from parent. Found that they need to talk directly with driving-age kids because parents do not know what trips they take. Data from age 15-16 is collected from child with permission from parent. Send out a diary and do recalls to get a phone report of actual travel. After 3 days, a proxy is used if household member unavailable. Some people want to send in a diary and not talk on phone because they already recorded trip. If it looks like a refusal to provide data, accept just the diary. Know we are getting lower trip rates from a proxy. Actual interviews with the people who made the travel is the best way. Not yet web-based but being considered. Double sample in transit areas to get enough transit information.

Goulias: If things are not done carefully at the sample selection stage, it could complicate things so much that no one knows what to do with the data or how to use it in models. In choice-based, need to know weightings.

Lee-Gosselin: Many cross-sectional surveys are done in Canada. Toronto surveys 100,000 for a population of 4 million. The large sample size may be a result of stretching small samples too much and computers can do more now. Quebec City has a population of 630,000 and every five years 30,000 households are interviewed.

Arce: Survey cost is approximately \$120-140/household. Breakdown for \$130/household survey: \$25 design, \$45 recruitment, \$40 retrieval, \$20 data processing, geocoding and cleaning.

Murakami: \$145 for NHTS. After recruitment, a lot of money spent on data retrieval. A lot of callbacks.

Arce: A panel could be a group that is visited annually. Or a panel could be defined as a well-stocked warehouse of respondents with good future potential to be accessed. The first could be a subset of the second. How well the "warehouse" is set up and how well it is maintained and accessed is important.

Lee-Gosselin: There are three kinds of panels:

- Annual fishing expedition - might conclude that an intentional rotation makes sense.
- Pool of people whose characteristics are known and can be used as a sounding board.
- Panel conditioning is useful. The idea that changes in cognition that come about over time should be planned in. This is an attribute of design, not a different panel. Do not want to rotate but allow natural changes to occur.

Golob: If there are people coming in and going out in every wave, can capture good information. Lee-Gosselin: It also allows you to understand the mechanics of actual change. We should not just control for these but consider them sources of data.

Goulias: Look at some conditioning and others are controlled - stay for entire panel, rotate them out. PSCOG is using a tandem survey - 1700 LPS and 3000 CSS. It would be interesting to take the 1999 wave of LPS and CSS and run some tests to see if behavior is different.

Lawton: What question do we need to ask to answer the policy questions we want to answer? Need to ask questions about how to do sampling. Still looking at LPS enriched with CSS. Would like to hear more about a warehouse panel.

Goulias: We need to make sure that we do not preclude options for surveys in the future.

DAY 2

Lawton: Vision to think about -

- LPS with satellite subsamples.
- Core questions to obtain regular demographic and travel information.
- Concept of "warehouse" to access larger group for specialized surveys.

- Stated preference for de nova households or probe special aspects of households.
- Need a full-time staff person who manages the program.
- If we want to pick up data during the year, consider passive data collection from everyone. Have a large group and survey a group every month.
- Perhaps do everything passive and do recalls to obtain missing trips and get good route choices.
- Use GPS for both people and vehicles.

Murakami: If you are going to do a panel, just give them the equipment and they own it. Let them use it during the study and at the end they either send it back or pay for it. How many days of data collection will be done? Seven days multiple times a year? Annually? What scheduling cycles do we want to capture?

Griffiths: Need enough data to identify substitution travel. Telecommuting and reduced workweeks have impacts that should be captured. Telecommuting likely leads to more weekend trips.

Bradley: Would be easy if we did not have to go back for retrospective call back. How useful is the data if they just carry the GPS and we not ask them anything? If passive, may not have to ask questions about every day of the week. Only ask for one. Adler: One could infer a lot about the travel without asking questions (by comparing direct survey data with passive info). But could infer bias.

Goulias: Include Sat/Sun data. Take passive data and reconstruct how the person spent the week. Then go back to the person and ask them to correct the information. Could pick a random day.

Lee-Gosselin: If lots of data is collected, be prepared to do a lot of post-processing. How much are we willing to put into post-processing to quickly get back to the responder? If doing passive monitoring and fitting it back, need to be able to distinguish among trips. For example, need to be able to separate traffic light stops from stops at a day care. GPS signals are lost in shopping centers. Fax machines have been used to retrieve data in Canada. GPS is not designed for continuous monitoring. There are power problems if used for a long period – may be rectified in 2 years.

Arce: It is possible in 24-36 hours to generate a calendar of someone's experience and feed it back to them. A visual approach would be good but is probably prohibitive. Will be doing a small test in St. Louis, doing half the household with Internet access and half with telephone. The medium used to review the data with the traveler is important. It is hard to get people to visualize a log.

Lee-Gosselin: It is possible to efficiently post-process. In Canada, 98 percent was done automatically. These were car-based units and it was done on a multi-car basis. Bradley: In California, people have been given Internet access.

Lawton: Need to talk about GIS on a statewide basis, especially if we want to pick up longer trips.

Goulias: Need to be careful that by providing advanced equipment to people we do not change their behavior. Non-standard trips may emerge.

Murakami: NTHSA is doing a study that carries recorders in the car and transmits every Sunday morning.

Bjelland: We need to be forward thinking about tools that will be available when the survey will be done, to take advantage of the most current technology.

Goulias: For air quality, cold start, hot start, etc., car-based recording is good. It would be good to have car-based for all cars in the household and can synthesize for rest of population. Use of GPS in cars is great for hot/cold start data. Lee-Gosselin: Equipment attached to cars can measure fuel flows, temperature, etc. and is becoming more affordable.

Lawton: Should GPS be used for info on the primary driver, or some other sub-sample?

Arce: 80,000,000(?) cell phones are now in use. Bradley: Mobile telephones can be a survey asset. Need to be careful with coverage areas and the travel effects of that technology. Maybe a mixture of GPS and mobile phones is appropriate. There are two reasons to do people-based records: coverage of the population and technology effects of doing the survey.

Arce: GPS units have successfully been used and returned to the surveyors. LA is an exception, however.

Murakami: There is a cost to getting equipment installed and reinstalled. Should take complete advantage of the user to cover more than one day.

Walker: Is there a way to collect a lot of data and then randomly select the days to review so that people do not artificially change behavior? Not necessary with a passive study.

Lee-Gosselin: If you are interested in electronic aids in scheduling, this should be done with research groups. If it is important to know how people go about making choices and segmenting their time, then some visual structure is helpful and may be necessary. There is a strong case for using electronics for passive

monitoring for a long period of time, at least as a subset, and especially if there is a process to feed it back to the person. There are still some technology problems and there is an advantage to hard-wiring cars for long-term information.

Bradley: Should commercial vehicles be included? Is there enough information to make it worthwhile?

Murakami: It was difficult to select the sample for commercial truck recruiting in CA. Not enough time was spent developing the relationship to get good participation. Another problem was with the drivers - did not talk with them about the program and drivers unplugged the equipment. It should be noted that more than 50 percent of the truckers are independent.

Golob: Did private and for-hire carriers and response was very high. Good database for drivers, including driver/owner companies. Needed to do a lot of calls to get the right person. Donnelly: Had no problem with carriers. Useful to have coeds do the survey. Griffiths: It might be easier for a non-government entity to get information. If approached by a government person, truckers are not responsive.

Lawton: Light commercial vehicles have not really been surveyed and it might be worthwhile figuring out a way to survey them. Passive collection of information from small commercial trucks would be useful. Gillette: ODOT is working on a research program to collect this information.

Goulias: Shipper vs. carrier has been the traditional way to think about truck traffic, especially in urban areas. Some of this information can be obtained from households - do you have a gardener or regular deliveries? I suspect there are a lot of business-to-business trips.

Bradley: It would be nice to have business relocation information similar to household relocation information. An LPS for business is probably not good, but it would be good to have a business survey.

Walker: Even though travel is random for carriers, it is important for policy-makers to know how random it is.

Lawton: Do not want to design commercial facility survey right now. Very expensive and full of sample problems. If we are doing GPS, may want to do both households and commercial.

Goulias: GPS allows some validation of speeds.

Lawton: There is a need to consider person travel and commercial travel. Should we do both? Alternate years?

Bradley: Those that drive around all day (e.g., salesman) should perhaps get GPS units.

Lawton: How much should be passive? All samples? 20 percent?

Arce: The practice to date is to build overlapping and redundant methods to collect data. There is no reason that we should not trust ourselves to abandon that practice (use GPS for x percent and Y percent telephone). Requests for proposals (RFPs) are very vague for GPS. No Department of Transportation or Metropolitan Planning Organization has designed a well-defined requirement for GPS.

Murakami: Keep in mind the quantity of data that must be processed with GPS. Maybe use passive GPS but augment with other techniques. Can you afford equipment loss? Lee-Gosselin: If a high quality and well-trained panel is used, it is possible to use GPS with minimal loss. Cost is not just equipment cost, it is also equipment support cost.

Murakami: Dave Roden has built software to convert GPS point data to trip link data for cars.

Lawton: With GPS, a person may forget to charge a unit, take it with them, etc.

Murakami: Proponent of cash incentives. Americans are willing to trade privacy for money.

Lee-Gosselin: With a personal GPS, a lot of the captured data can be suppressed in order to keep the quantity manageable.

Break

Lawton: With passive data capture, a daily download of data is possible. It is desirable to use GPS on persons since we are modeling their movements (vs. cars). Need to beware of any technical effects. Bradley: Some kind of auxiliary method may be desirable with passive.

Donnelly: Could give panel the option of how they would like to record their data. Make sure there are two representative samples so we can see results from both groups.

Goulias: When submitting RFPs, the contractor should include a technology package as part of the technical proposal. Donnelly: The RFP should be split between the technology piece and the survey.

Lawton: Maybe passive could be collected for a longer period of time. Arce: Suggested three consecutive days – well rotated through the week so that each combination of three days is covered. Focus on doing good survey for those three days.

Golob: Get most information in three days, not enough additional information from going to seven days. Need three days so there is more than just a weekend report. Murakami: There has been little research between a two-day and a three-day survey.

Lee-Gosselin: Amount of time depends on how well panelists are treated. In a vehicle-based survey, there is a higher response for a 7 day. Comes down to the approach used. Adler: In a web-based survey, the respondent may need some learning. The 2nd day is better than the 1st. Murakami: Phone retrieval for a three-day survey requires too much time on the telephone. Web-based is probably easier.

Arce: Compared to 1994, there is a more efficient use of interactive computers. If doing two days, helps to do geocoding during the interview (up to 70 percent to 80 percent can be done during the interview). It is important to prevent "ditto" responses, but also make sure that those things that are the same as day 1 are easy to record.

Adler: Self-geocoding for Internet responses. Have business address database that is pre-geocoded. Lawton: A lot of the information for business should already be geocoded in Oregon, it needs to be updated.

Golob: Do we include every day of the year? Need to do all year to be truly representative. If doing all year, three days is important. Bradley: Depends on the purpose. If using data to fill gaps, two or three days are not important. If this is most of the information, should be three days.

Goulias: Need to address unique patterns during a day as opposed to the normal ones.

Lee-Gosselin: If much of this will be passive, need the following information - activity duration, activity purpose, mode used, type of facility. If we can get this information from passive, may not be a reason to worry about two or three days. RFP should ask how this information will be collected. If you can get most of the information from passive, perhaps use personal survey to get information on how people make decisions. Have people define work efforts into what is done with planning or what is done without pre-thought. Trying to understand who in the household plays the role of dispatcher. Which of the things we observe going on have active involvement, by whom, which runs on inertia, which things are peculiar. Goulias: If you do this, need information on communication and

structure within the family. The intent of what we are doing is to find true information.

Bradley: Once you have daily information, there is unlimited information that can be taken from the survey. This does not necessarily need to be built into the survey plan from the beginning.

Murakami: Can do passive non-GPS surveys (e.g. PDA) like a game and they are not so burdensome. Could possibly get more days using this technique.

Bradley: Is it a good idea to give people Internet access if they do not have it now? Adler: Using it as a recruitment incentive may be a problem because so many people have Internet access. It may be more effective to use existing systems - libraries, etc.

Murakami: Trying to get origin-destination information for a new bridge crossing in Washington DC. Taking out a one-page ad in the Washington Post and will give a website address. Will be some bias but it is a random sample. Lawton: That technique yields a choice-based that is also self-selected. Sometimes self-selection techniques can be matched with random. Should we be considering one or three days of data collection?

Arce: If you have detailed daily data for one or three days, what are the set of additional questions and how might these be asked? If fewer than seven days, there are questions that modelers might want answered. Focus on 8-10 specific things. Do as a retrospective - in the last seven days, did you ____? Perhaps one day should be detailed but the others could be general (e.g., how many shopping trips, work trips, etc.).

Golob: Retrospective information is useful. Models told us that express lanes resulted in time savings. A problem with retrospective data is you find out you are missing a key variable.

Bradley: Multi-day samples are really a larger sample day. Most models do not look at two days together. They are recorded as two household days.

Arce: Suggest a varied approach: seven consecutive days of GPS; one full diary day for all people in the household; three full diary days for a randomly selected work force participant in the household.

Lunch

Lawton: Prioritized remaining discussion:

- Recruitment/sample framework
- Data capture methodology

- Sample design
- Survey content

Lawton: With choice based sampling you need to know the weights. Need to know how urban the area is - very urban, urban, suburban. Can be defined absolutely in terms of a number. Useful for mode choice - aggregate behavior is lots of walking, transit use in more urban, more bicycling in less urban. When considering a statewide model, how much information do we need? What is the minimum sample size needed for reliable data?

Bradley: Should test for regional differences but there is a lot of pooling of data from around the state. What information do you have that is correlated to behaviors that are difficult to capture, i.e., renters? Need to think of probability of certain things so they are captured outside routine sampling.

Griffiths: Are there a large amount of unpublished phone numbers? Lawton: Yes.

Murakami: For a panel, it is important to establish and maintain "personal" relationships. Have the same person track the response from selection through retrieval. Employee retention then becomes very important. Need to give people results to let them know their information was useful. Important to be responsive to interviewees. Give them an opportunity to express problems. Have used a tri-fold brochure included with a formal introductory letter. Need to put a face on the project team (use pictures).

Adler: In Tampa, a director answered all the written comments (e.g. potholes, etc). Personally signed letters are good. Lee-Gosselin: Treat people like human beings. When analyzing panel data, you need to define rules for when a households changes.

Lawton: What do you do when a household splits? At what point does a household become a different household? Need to set up rules on what is a real household. Golob: Once a households drops out, they should stay out.

Lawton: How many waves should be done? Four? Griffiths: The first year is the same as a CSS. The second year is where you pick it up. Question of when do you tell a households that they are part of long-term survey? Are folks afraid of a long term commitment? By law, need to tell people that they will be called again.

Goulias: Because of funding, tell people they are on a LPS but do not tell them how long they will participate. Golob: There is probably information in the literature on people' response to being on a panel for a long time.

Arce: If data collection will go for a long time, may want to look at ways to keep people excited. Make sure people are told how important their participation is. Can also change ways data is collected but need continuity for the model. Lee-Gosselin: Which is worse – scaring people off or attrition?

Murakami: When measuring seasonal variation, do you need to go back to the same households every three months? Lawton: No. Just rotate the samples.

Group: Good to send reminder cards. Within five years, 55 percent of the households generally move.

Lawton: Are there any differences in recruitment for a panel vs. cross-sectional?

Bjelland: Do we want to do random digit dialing? Can get lists that have been recalled and can use for random digit dialing. Random digit dialing has fallen out of favor.

Arce: Mixed frames can be used (e.g., addresses, unlisted phones, Internet addresses). Try to identify those with private lines. There are 80 million cell phones. 4.7 percent of American households have no phone. The source of all working phone numbers is the Federal Communication Commission (FCC). Donnelly: In San Francisco, eight percent of households only have a cell phone. Is sending people out to recruit cheaper than random digit dialing?

Bradley: Could e-mail recruitment techniques be used?

Arce: Find addresses and then figure out how to contact the person. Try first to find phone number, then look at other ways to find their address. Murakami: There is a correlation between cell phone users and low-income renters. Because of this, need to think about address-based. They are often not home and difficult to locate.

Donnelly: People hate spam. Some people have filters to automatically delete it.

Arce: Suggest that a letter be sent to addresses with a phone stating that you will call them at a set time, i.e., we will call you at 2 p.m. on Tuesday and if you do not answer we will call you again at 7 p.m. on Wednesday. A higher number of people answer the phone.

Donnelly: Include in the letter a web site reference and email address where you can be reached. This helps with credibility. Arce: That was done in St. Louis. Got local paper to run a good article about the members of the study. Write a good letter, follow up with a post card.

Golob: Nervous about bias. Very important that once you identify a participant, you call back as many times as it takes to make contact. Arce: Invest a lot of time in the beginning to get the list of addresses. Important to call back as many times as necessary. He has done as many as 30.

Lawton: Once a household is identified, stay with the family in the household. Need to regularly refresh to make sure sample is representative. Arce: Each sample is one of three in the original design. If first drops out, go to the second.

Break

Adler: Suggest that the respondent be provided a choice in the method of response. They appreciate it and it reduces the burden on them. Mail responses have lower trip response as compared to website prompts. Have not done systematic recontact with mail and that is part of the problem. Mail back response reminders need to be planned for in advance. Donnelly: Strongly supports.

Adler: In data recovery, there are differences between web-based and CATI. The design is very important.

Griffiths: Need to guard against bias in a self-administered survey. It is important to have the interviewer interact with the responder. Need to have enough staff to do immediate response analysis and call backs.

Arce: If using a GPS vehicle instrumented survey, could work in 3-day cycles. Abbreviated phone follow-ups could be made. Very pointed questions could be asked. One could probe for non-vehicular travel.

Lee-Gosselin: If our main emphasis is passive, how do we collect and refine information? Have data transmitted daily by radio or some other easy method. Go back every second day to update information. Fill in variables through telephone recovery.

Bjelland: Get demographic information while installing passive equipment and follow-up when equipment is taken out of the car. If you do passive, call every 48 hours and update instead of sending them follow-up. Problem - if there are follow-up questions, need to talk with everyone who used the car.

Donnelly: One could do a lot electronically using a PDA. It could sense when a person is on transit. The data could be uploaded easily. Lee-Gosselin: Remember that a person needs to turn on a PDA. There are antenna issues. There would be a lot of data gathered – need to suppress some of it. You would need some research money to make this technique work. If vehicle GPS is used,

recommend that the work of Geotech is reviewed. It is easier to have people FAX to you rather than have them keep their FAX connected to receive.

Arce: On a three-day cycle, conduct abbreviated telephone retrieval. Need to develop a new order of questions. Anything that involves a car, ask just a few questions. Call them every night for three days. Probe daily for non-car travel. Come up with a simple way to do it and match GPS record and daily record. People are more comfortable with every other day instead of daily. If going to the effort to set this up, go for seven days instead of two or three. Lawton: Eighty percent of data is car-linked.

Lee-Gosselin: Have a pocket device that is charged daily. Push a button that dumps information through the telephone. Data transmission is expensive. Need to have PDA shut off if there is no movement.

Donnelly: If this were opened up it can be done with pooled funds.

Lee-Gosselin: Georgia Tech project is a good example of how to collect information.

Donnelly: Already get pretty good information from cars. Need personal information.

Arce: GPS units are 4x6x1½ without the cell.

Murakami: A schedule needs to be developed as to when units will be picked up from respondents. Good to pick up units in person.

Donnelly: Start with the premise that we transition everyone to GPS over time. AT&T plans to cover the U.S. with GSM. Bertini: The 911 number is being put into telephones for emergencies. Kyocera can do a PDA and cell phone. Lee-Gosselin: Need a telephone with data storage. The long-distance travel only needs cell information in x,y.

Bradley: Does the panel data get messed up as new data collection techniques are introduced? Group: Unfortunately, yes. Donnelly: Once a person starts with one technology, should stick with it for each wave.

Golob: There are people who will not use technology and they need to be included to have a representative sample (e.g., would an 80-year old use a high tech device?). Donnelly: An RFP should be written to have someone investigate the feasibility of different technology.

Goulias: Like passive collection and do personal follow-up. Random sample for those we cannot reach.

Dill: Likes idea to personally collect data – can show responder the results.

Golob: It takes a while to develop technology data collection methods. Cannot compare data collected by different means unless it all happens at the same time.

Lee-Gosselin: The vehicle based GPS is a known technology in terms of GIS post processing. One could add a person-based GPS to the mix. Make sure a full diary is obtained as a backup. Would have a minimum of traditional one-day diary.

Lawton: Once someone starts on a traditional diary, how do we change to GPS in the future if we want to go to full GPS? Donnelly: Have two panels and phase one out over time as technology advances.

Lee-Gosselin: The RFP should require construction of all the support systems necessary. Part of the RFP should be to use "klutzy" person-based equipment.

DAY 3

Lawton: Provided a summary of recommendations and ideas from the previous two days:

1. Oregon will develop a longitudinal panel survey.
2. The survey will have a standard core with ancillary/special surveys.
3. A panel sample "warehouse" will be established to provide quick access to responders for special purpose surveys.
4. The survey will focus on passive data collection using GPS, both vehicle-mounted and personal units.
5. A split panel will be established:
 - one part will include traditional daily travel diaries (self-reported) collected by multiple methods;
 - the second part will use the passive data as the starting point and will include multiple methods to fill in the missing information about activity purpose, number of passengers, and passenger activity purpose.
6. Collection methods will include telephone, personal interview, website browser and perhaps mail-back.
7. The sampling procedure will be geographically stratified with a focus on behaviors of interest - address-based sample frame accessed by both telephone and personal interview when required.
8. A mail-out will be done before the telephone survey, with follow-up postcards if necessary.
9. There will be a focus on personal attention for the panel households (Werner-Brug).

10. A single interviewer will be assigned to each household over time to build a personal relationship.
11. Survey duration will be 1-3 days for the traditional diary panel; the passive recording panel will be a minimum of 7 days.
12. Recruit choice-based samples where needed – park & ride? MAX LRT?
13. Set a minimum of 30 callbacks for recruitment.
14. Appropriate agency staff will be dedicated to manage the program.

Remaining issues to cover for Day 3:

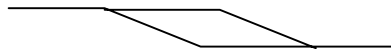
1. Content and instrument design – consider both travel and housing location decisions.
2. Cost.
3. Incentives to encourage survey participation.
4. RFP issues.

Golob: Sketched on board:

Diary Technique (non-passive)

t1 t2 t3 t4 t5 ... tx (panel transitions over time)

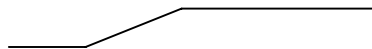
N_D



GPS Monitoring (with post validation)

t1 t2 t3 t4 t5

N_G

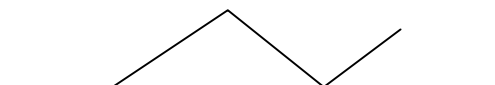


Opportunistic Enrichment

t1 t2 t3 t4 t5

N

? (As money is available or work for others)



$$N(\text{GPS}) * \text{Cost}(\text{GPS}) + N(\text{diary}) * \text{Cost}(\text{diary}) = \text{total cost}$$

The number of samples using each type could vary with each wave.

How do we move from diary to GPS without losing people or data value?
 Modelers need at least two waves at high level. Ideally data would be at the same level for a period of time.

There might be a bias if only take people who are passive. Cannot compare with last survey - do not put much into comparing surveys because so much changes over time. Cost issue - if it costs too much for equipment, may not do GPS.

Walker: Are there any concerns with regard to the small sample size? Adler: Generating descriptive statistics could be difficult with a small sample size. From a public policy perspective people will be asking how travel is different from month-to-month. Need enough resolution of survey to be able to answer this question. There is a question about whether people behave different in different regions.

Bradley: Do not need a LPS to answer these questions, they can be answered with a CSS.

Lawton: Will build a base model and then look at data over several years to identify seasonal differences. Washington DC is using panel data for policy answers, not using for modeling. Can compare large vs. small cities. Descriptive statistics are expensive. Need a large enough size sample to be able to identify indicators with statistical certainty.

Bradley: Data can be used for tendencies, not absolutes. Could do a cross-sectional first – then a panel to isolate tendencies. Lawton: If money was available, that would be nice.

Arce: Panel sample warehouse is expensive. The expense is unavoidable if you want to have a sufficient-sized sample in the future. Need to build a five-year choice model and select the panel looking at the future for a variety of uses. May not have to collect a lot of data.

One could create a matrix of techniques:

Technology Augmented Data (GPS)			
Vehicle	Person	Both	Neither

- Full diary-3 day
- Full diary -1 day
- Mini survey
- Post validation (interview)

Imagine synchronizing data. Shift this over time. Pittsburgh and St. Louis helped surveys with good publicity. Pick up minimum data now but have people available for special needs. One must figure out how to eliminate redundant data. It is important in order to reduce costs. See how far you can go with passive data with a little personal contact.

Jaffe: You need data to build and influence the models. Washington DC has not done that with their survey. We have talked about methodology but have not talked about a plan.

Griffiths: There is a core survey that goes on every year. We add some issues when there is a specific question. Need to be controlled in the questions. Ask the question "what question are you willing to give up to ask a different question?"

Lawton: Difficult questions - picking up areas where we are likely to have different behaviors.

Golob: Expressed concern with refreshing the panel and maintaining the appropriate weights (e.g., geographic changes). As populations change, need to modify survey to keep it balanced.

Goulias: There are lots of things to work out. The things we have been talking about have not been done before, but could be. There is a difference between research and implementation. It has taken a lot of time to get MPOs to move away from traditional four-step models. TLUMIP is revolutionary - disaggregate activity-based.

H. Kim: Can models can be built with this data? Bradley/Goulias: Yes, we are building a bridge.

Murakami: The goal of models is to look out 30-50 years. A problem with models in the 1960s is they did not predict women in the work force. The biggest impact that we have to work with is the retirement of the baby boom. Need to define what people think they will be doing and build models to predict some of this. A panel can track things like women in the work force, more active life styles by older people, etc.

Lawton: What we can do today is predict what 80-year olds today do. It will be very different in the future.

Golob: Be careful with retrospective - one can capture endogenous data (e.g., autos, housing, etc.) but not exogenous (e.g., transit service, income, etc.). Use to identify previous behavior for background information but cannot predict with this information. Information needs to be in context and memory fades.

Goulias: Retrospective may be good for first wave. Golob: Do CSS for the first wave. Arce: Household composition is very complex.

Murakami: When you do a panel, because you know you are going back to them, use that as a opportunity for an attitude and value survey. Can break up the survey event to do some questions later.

Adler: This is a statewide survey. Is there a need to augment samples? How do you capture long trips?

Arce: Ohio DOT is doing a statewide survey of MPOs. Separate surveys but with same survey and methodology. The long-travel survey is a separate statewide sample and has criteria for survey parameters.

Lee-Gosselin: There are some long trips that are done in a day but are not commuter. People in France called into a number to report trips that met certain requirements (50-250 km trips).

Bradley: How do you ask questions on how people make decisions? Ask people how they perceive their neighborhood for different issues - transit access, etc. What do they say about constraints on mode choice, etc. Usually cannot use this information directly in modeling but helps explain some things you see. The problem with models is that you can only forecast things you can forecast but this gives good information.

Arce: Something that can be done now is to think of data content as more than conducting a survey. Data content other than the survey is important. Need to collect contextual data (e.g. employment). Look at all data that you can legally or ethically acquire. What is there now? Find out how to obtain updated and accurate information.

Goulias: Data falls into tiers – required, important, nice to have. Maybe other interest could pay for 2nd and 3rd tiers (Smart Growth, Clean Cities, etc.). Plan to pay for the first year, but in future years can sell information and ask more detailed questions.

Arce: It is good at this stage to not think of 18-23 months of a survey. Split samples where a certain battery of questions is asked to 40 percent of the sample, another set of questions for the next 40 percent and another for the last 20 percent. Need to keep track of who got which survey.

Break

Golob: Sample could be split several ways - ask questions randomly to 40 percent of the sample. Does not have to be choice-based. If people who move are 20 percent of the sample, ask them and 20 percent who did not move to define how movers are different from non-movers.

Lee-Gosselin: Segmentation is a problem. Need to know where people are suppressing activities and how that affects travel. Also need to know which households are ripe for change. Questions: "Of these trips you made, which were the most unsatisfactory and why?" or "Was there a trip you did not take that you wanted to take?". Need some forward looking questions but need to be careful of self-defined issues.

Lawton: How much flexibility should be built into the RFP? Adler: Include enough detail in the RFP to be clear on what is being proposed, but allow flexibility for different approaches and ideas. Murakami: The more specific the better. Need to be as detailed as possible so that proposers do not challenge the process. Goulias: Need to be specific about the content. Make it performance based with clear expectations instead of telling them how to do the work.

Lawton: How do we get in-home or work-at-home activities? Golob: Get all activities at home that are constraints on time. Just being home does not matter. Only want to know what constraints are driving travel behavior. Not obvious how to identify this. Would be good to know number of shopping trips relative to use of the internet. Goulias: Question is not what did you do at home, but rather did you need to be at home?

Golob: Have information on "e" use. People who travel use mobile telephones more. Not clear whether using telephone causes more driving or using phone because of traveling.

Lawton: Are people substituting for travel? How do we get this information? Arce: The amount of internet use has been recorded in the past. Murakami: Should not substitute technology for other travel. Personally, shop online but physically buy at bookstores. Wert: Opposite is also true. Personally evaluate merchandise in stores and purchase specific models online.

Lee-Gosselin: You need to know what level of access a person has. More than an inventory is required. Need to ask more than "Do you work at home?" Need to ask "Do you schedule time to be available at home?". There are many varied lifestyles. We need a better sense of how people view the role of home - as an escape, a place to write, etc. There are some patterns that have something to do with at-home and outside activities.

Bradley: What is important is when people come home and then leave again. Could ask responder to define a normal work schedule – are you at a work site, at home, driving around? The early morning and the last part of the evening are not important. The time in between is.

Golob: It is very important to identify constraints (e.g., day care, does the employer offer start time flexibility). Can infer some information like getting a

child to school, but do not necessarily capture the person who needs to be home to meet a child after school. Question of constraints vs. choice.

Lee-Gosselin: Is it unrealistic to identify and classify every activity? Perhaps we need to identify just the “sacred” ones.

Bjelland: Are there different surveys for different household types? Some questions are not relevant for those who do not have children.

Lee-Gosselin: At this level of detail, need only one survey day. If there is good post-validated GPS, take one day and get more detail. Question is if it is random or do you choose the day? Golob: Consider using the same amount of resource to get more information from one day than less detail over several days.

Bradley: Would be good to have different costs for essential data. May be able to get other people to pay for non-essentials.

Lawton: A panel is nice because planning is done early, recruitment costs, geocoding, get information back. It is a trade-off cost - there may be a cost for the vehicle and each member of the household but you only need to ask a few questions for the cost trade-off.

Lee-Gosselin: A continuous survey using expensive passive equipment may be worth it.

Arce: Important characteristic to note. It is good to have continuous year round interviewing. The interviewers become very knowledgeable.

Golob: Are internet costs an issue for reimbursement? Many people already have access. Are there concerns about fixed rate vs. metered use? Arce: Be cautious about the universality of the internet - there may be little connection to literacy and how computers are used.

Lawton: What is the cost to instrument the survey, collect the data, replace panel members, etc.? How many households and how much money is needed? Group discussion: About 6000 households at \$130 each - \$500,000-\$800,000 annually. Goulias: Need some guarantee of funding for several years to get started.

Lee-Gosselin: Need a one-time capital sum to buy equipment. If equipment is purchased outright, cannot use federal funds. Lease over time so can spread the cost and can use federal funds.

Arce: It is time to look at public/private partnerships to fund surveys. It is possible for a vendor to have an open-ended agreement. They might accrue a

financial loss in the early years but recover at the end. Perhaps a shared cost agreement could be reached. If personal information is stripped, could share data with private enterprise. A company can capitalize and amortize a panel.

Griffiths: Intellectual and property rights and privacy are issues. Group: Concern that respondents would decline participation.

Goulias: Is it possible that equipment could be donated? Lee-Gosselin: Have had some experience with this. Be aware of confidentiality when using GPS to trace paths. Be clear what information will be tracked and how it will be used. Lawton: A synthetic household would show a synthetic trace. To get started, can call it a "pilot" project and get legislative exception.

Golob: Seek money from the Housing Department and others. Goulias: Use university transportation centers and cost-share. Might be easier to have business give equipment to a university for public use. Researchers can "buy" the data from there. Project - \$300,000 per year for consultants, \$150,000-200,000 for internal staff, 2500 households, no GPS component, one-day diary.

Griffiths: Will send ODOT some detailed cost data. Washington DC spends about \$500,000 per year for 2500 households.

Golob: Universities are less expensive than consultants but it is difficult to force them to deliver products.

Murakami: Lexington offered \$50 for a completed 6-day survey. Gave \$20 with diary and video and \$30 when equipment was returned. Young people are very motivated by incentives. Cash is often used.

Arce: It is not necessary to pay for GPS use. Do not think only of incentives, this is only one thing that motivates to participate and continue. Bjelland: The lottery has been used in Oregon.

All: Other things are often more effective than cash incentives:

- Personal relationships
- Signed letter
- Legitimacy/publicity - good TV coverage
- Gifts - maps, guidebooks, coupons for State parks
- Chance to win prizes through drawings
- Give choice - \$10 or lottery for \$180 dinner

Lawton: Thanked the panel members and guests for participating. Next steps:

1. Panel members should forward additional comments on the preliminary white paper to Lawton.
2. Staff will complete and update initial white paper.

3. Prepare panel outcome white paper to include strategy and development of detail of the survey, leading to an RFP.
4. Begin discussion of funding of survey with OMSC members.

**OREGON MODELING STEERING COMMITTEE
OREGON LONGITUDINAL PANEL SURVEY
EXPERT PANEL WORKSESSION
May 29-30, 2002 - DoubleTree Inn, Lloyd Center
May 31, 2002 - Portland Airport (PDX) conference room
Portland, Oregon**

AGENDA

DAY 1

8:00 a.m.	Introductions/Refreshments
9:00 a.m.	Welcome/Administration
9:30 a.m.-5:00 p.m.	Modeling Analysis

Welcome/Administration

- Purpose of the workshop - *Lawton*
- Introductions - *All*
- Charge to the panel - expected products and results - *Lawton*
 - Modeling analysis:
 - Analytical needs
 - Model review
 - Model recommendations
 - Survey methods:
 - Survey design review
 - Survey content
 - Sample design
 - Recruitment
 - Data capture methodology
 - Recommendations and cost estimates

Modeling analysis - "What do we need from a survey?"

- Analytical needs - *OMSC staff+*
- Model review - *Round table discussion with modeling experts*
- Model recommendations - *All*

DAY 2

8:00 a.m.	Informal Day 1 Recap/Refreshments
9:00 a.m.-5:00 p.m.	Survey Methods

Survey Methods

- Survey design review - *OMSC/All*
- Survey content - *All*
- Sample design - *All*
- Recruitment - *All*
- Data capture methodology - *All*

DAY 3

8:00 a.m.

Informal Day 2 Recap/Refreshments

9:00 a.m.-11:30

Recommendations and Cost Estimates

11:30-noon

Wrap-up/Next steps

Noon

Adjourn

Recommendations and Cost Estimates - All

Wrap-up/Next Steps - Lawton