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1.) Commute Mode and Latino New Urbanism - Evelyn Blumenberg

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Summary
A number of urban planners and activists claim that Latinos in the U.S. are at the forefront of “new urbanism,” the creation of dense, walkable neighborhoods that contain a mix of activities such as employment, housing, shopping, and recreation. If so, Latinos might be more likely to travel by modes other than the automobile compared to non-Latinos.

We test this proposition using microdata from the 2006-2008 American Community Survey (ACS). In particular we use discrete choice models to examine whether there is a positive relationship between living in a Latino neighborhood and commuting by carpool, public transit or non-motorized modes (walk and bike). Further, we test whether this relationship changes if individuals are Hispanic, Hispanic immigrants, or recent Hispanic immigrants (i.e., arrived in the U.S. within 5 years of the survey). We first model these relationships for workers in all U.S. metropolitan areas. We then focus separately on Hispanic commuters in the six U.S. metropolitan areas with the highest number of Hispanic workers—Los Angeles, New York-NE New Jersey, Chicago, Houston, Riverside-San Bernardino and Miami-Hialeah. Approximately one third of all metropolitan Hispanic workers reside in these six areas.

Like other studies, we find that Hispanic workers are less likely to drive alone to work than other commuters. Recent data from the ACS shows that they are twice as likely to carpool and more than twice as likely to use public transit compared to non-Hispanic whites. However, differences between Hispanic and non-Hispanic workers have narrowed over time. The percentage of Hispanic workers that commute by solo driving has increased 16 percent since 1990. Further, as of 2009, the percentage of Hispanics that commuted by automobile (both solo driving and carpool) was almost identical to that of non-Hispanic whites.

Our neighborhood analysis suggests an association between living in a Hispanic neighborhood and commute mode choice, although this relationship varies by population group and mode. The most consistent results relate to carpooling. Relative to solo driving, carpooling rates are higher for Hispanic
workers than non-Hispanic workers, in Hispanic neighborhoods, and among Hispanics, Hispanic immigrants, and recent Hispanic immigrants who live in these neighborhoods.

With respect to public transit commuting, the story differs. Once again, relative to solo driving, Hispanic commuters are more likely to rely on public transit than non-Hispanic commuters. However, controlling for race and ethnicity, residents of Hispanic neighborhoods have lower transit usage rates with one exception: recent Hispanic immigrants living in Hispanic neighborhoods have a higher likelihood of commuting by public transit. Finally, Hispanic commuters, regardless of neighborhood, are less likely to use non-motorized modes of transportation than non-Hispanic whites.

These findings vary by metropolitan area. A few examples follow:

- Hispanic commuters are more likely to travel by carpool and public transit compared to non-Hispanic white commuters. This finding holds for five of the six metropolitan areas. The one exception is Miami, where Hispanic workers are less likely to commute by public transit than non-Hispanic whites, even controlling for household income.

- In Los Angeles, Chicago, and Miami, there is a positive relationship between living in a Hispanic neighborhood and carpool use. In Houston and Riverside-San Bernardino, Hispanic workers who live in Hispanic neighborhoods are more likely to carpool.

- In Los Angeles, New York, and Riverside-San Bernardino, there is a positive relationship between living in a Hispanic neighborhood and transit use. In both Houston and Riverside-San Bernardino, Hispanic workers who live in Hispanic neighborhoods are more likely to use public transit.

- In all six metropolitan areas, Hispanic workers are less likely to commute by non-motorized modes than non-Hispanic whites. With one exception, there is a negative relationship between residence in a Hispanic neighborhood and non-motorized travel. In Miami, workers in Hispanic neighborhoods are more likely to commute by non-motorized modes.

We interpret these findings in the paper, drawing from the broader literature on immigrants, ethnic neighborhoods, and travel behavior.

Overall, the study findings underscore the role of neighborhood ethnic composition in influencing travel in particular circumstances. In some areas, ethnic ties—often spatially rooted in neighborhoods—may enable carpool formation. In other areas, ethnic enclaves—neighborhoods with ethnic-specific employment, services, and retail—may facilitate shorter trips and, therefore, a greater reliance on public transit. Additional research is needed to better identify the conditions that influence the presence of these neighborhood effects.
2.) Floating Car Data and Travel Forecasting - Nick Cohn

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Summary
Floating Car Data (FCD) provides a new method for measuring speeds, travel times and thus road performance. Probe devices in vehicles, which may be cellular phones, or more commonly GPS devices, provide this FCD data. As these vehicles with the probe devices are free to travel anywhere on the road network they are called ‘floating’ probes and are not limited to roadside infrastructure to communicate with the FCD system. FCD can, as a result, measure traffic speeds everywhere probe vehicles are travelling, providing a number of major advantages when compared to the traditional methods. FCD:

• Does not require any installation or maintenance of roadside equipment, saving costs and avoiding any interruptions to traffic flow
• Provides information on the entire road network, not just sections where measurement infrastructure has been installed
• Provides accurate data on any complex trajectory
• Is most dense where there is congestion
• Is environmentally friendly
• Replaces a large amount of fieldwork with desk work.

Historical traffic information is collected by millions of navigation device users who share their usage statistics. These users voluntarily and anonymously report data for each of their journeys. As a result, TomTom now has a database containing more than 4 trillion measurements, collected since 2007 and growing continually.

TomTom’s historical traffic database has a number of unique characteristics, including:

• The database contains a very large sample size, filled by millions of different drivers. Because measurements are continually being made, the information is not vulnerable to, for example, bad weather conditions on one or two surveyed days.
• The database is primarily filled with information from passenger cars as opposed to delivery fleets or goods vehicles.

• The historical GPS speed measurements are matched to TomTom’s high quality road map, by individual road segment. The road segments are quite detailed, generally ranging in length from approximately 1 metre (1 yard) to 1.6 kms (1 mile).

Access to this map-matched, historical traffic speed data is available via a web portal.

The current challenge is to make more aspects of this data usable. There is great potential for using the GPS origin and destination information for transportation planning, as it should offer a lower cost and higher sample size than large OD field surveys. However, there are certainly some biases due to the source of the data (navigation users) and there are limitations because the data is anonymous. This means we need to look at ways of using Census data to create origin-destination tables that have some socio-economic characteristics. This research is just beginning.
3.) Analyzing the market share of commuter rail stations using LEHD data. - Henning Eichler

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Summary
What is the competitive trip market for commuter rail and how can we estimate the latent demand at commuter rail stations?

Questions like this have become much easier to answer thanks to the Longitudinal Employment and Household Dynamics (LEHD) data which represents a powerful tool to estimate market share and underserved demand for transit for commuter corridors, stations, and even specific trip origin-destination pairs. By applying the Level of Service (LOS) methodology for transit availability measures we can further identify opportunities to increase transit’s market share.
4.) Use of LED Data in Estimating Jobs Accessed through the Federal JARC Program - Caroline Ferris

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Summary
Account of how project team used LED data to provide FTA with an intuitive performance measure that relates directly to JARC goals of helping people get to work.
5.) Census Bureau Update - Alison Fields

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Summary
This presentation provides a brief overview of the upcoming release dates for both 2010 Census data and the 2010 American Community Survey. Some additional time will be spent reviewing specific future product plans involving commuting data from the ACS. Other topics of interest to the community, such as the status of the ACS disability question, internal research, daytime population and other migration and commuting flow products will be touched upon.
Regional air quality has greatly improved over the past several decades but local air quality “hot spots” remain a significant health risk for many communities. Locations near roadways are perhaps the largest air pollution hot spot. An extensive body of research shows that concentrations of dangerous air pollutants are elevated along busy roadways and that residents living near these roadways are at greater risk of negative health outcomes including respiratory diseases and cancer. Some studies suggest that low income and minority populations have a higher risk of negative health outcomes from exposure to air pollutants because they tend to live adjacent to heavily traveled roadways. This research quantifies for the first time the disparity in income and race of near roadway populations for each county in the U.S. The relationship between observed disparities and proximity to a road and the road’s traffic volume is also measured.

Methods

A Geographic Information System (GIS) program is used to create several distance buffers along each busy roadway in the U.S. Buffers are drawn at 100m intervals extending out to 500m around four categories of busy roads (50,000 – 100,000 annual average daily traffic (AADT), 100,000 – 100,000 AADT, 150,000 – 200,000 AADT, and > 200,000 AADT) for every county. The Federal Highway Administration’s Highway Performance Measurement System data are used to identify the traffic volume on each road segment. For each county, the median household income and the population proportion of each racial group are estimated for each distance buffer for roads in each traffic volume category and the results are compared with the county’s median income and racial profile. The demographic profiles of each distance-traffic buffer are estimated by overlaying block-level race and block group-level income data from the 2000 Census with the buffers. 2010 Census updates are in progress.

Results
Many studies find elevated concentrations of vehicle-related air pollutants within 300m of busy roadways. This analysis indicates that over 14 million people, or over 5% of the U.S. population, live within 300 m of roads carrying greater than 50,000 vehicle trips per day. Low income and minority residents are also overrepresented near roadways. The results show that income and racial disparities generally increase closer to busier roads; however, the results vary widely across and even within different regions of the country. For example, on average in the U.S. the proportion of Latinos and Hispanics in the population within 100m, 300m, and 500m of roads with traffic volumes between 150,000 and 200,000 AADT is 25%, 14%, and 11% greater, respectively than the proportion of Latinos and Hispanics in each county. Similar patterns exist for other minority groups, low income households, and at the other levels of traffic volume. Disparities for individual counties can be non-existent or much greater.

Discussion and Conclusions

There are two main findings: 1) many people live very close to very busy roads and 2) individuals living near busy roads are more likely to belong to lower income households or a racial minority. Additionally, very few monitors in the current national ambient air quality monitoring network are located near busy roads. Since the national ambient air quality monitoring network is one of the main triggers of regulatory action to reduce air pollution from motor vehicles in specific regions, the near roadway population may not be adequately protected by the current monitoring network and the provisions of the Clean Air Act. The observed income and racial disparities in the near roadway population raise environmental justice concerns.

One potential solution is to develop a more robust air quality monitoring network that requires monitors along busy roadways in each region. It may be impractical to locate enough monitors to monitor each unique highway population (since emissions exposure along highways is very complex and variable); however, a more refined monitoring network combined with high resolution air dispersion modeling could offer a feasible solution. For new developments, monitoring and modeling should be used to determine safe distances from highway facilities before buildings are constructed. Air dispersion modeling and the more robust monitoring data could also be used when developing a regional transportation plan to assess the population exposure and equity of different transportation planning alternatives.
7.) A Preview of Small Area Journey to Work Data from the American Community Survey - Ken Hodges

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Summary
The first 5-Year data from the American Community Survey (ACS) have been released – covering the period 2005-2009, and providing estimates for areas as small as block groups. However, ACS-based CTPP special tabulations would be subject to severe suppression for disclosure avoidance. To provide usable CTPP products, AASHTO has contracted with the Census Bureau for the production of synthetic estimates using a Westat method that preserves confidentiality by perturbing ACS microdata records. However, the first synthetic estimates are not due until 2013, so users are left to wonder what they will find in ACS journey-to-work data for very small areas, such as traffic analysis zones.

In this presentation, Hodges and Spar describe an initial examination of ACS data for two basic journey-to-work tables (Means of Transportation to Work and Travel Time to Work) for all block groups nationwide. Although different from the forthcoming synthetic estimates for traffic analysis zones, the ACS data for block groups are available now, and suggest some of what one can expect from estimates prepared for very small areas based on an ACS sample that is substantially smaller than that of the old census long form.

The analysis explores the distribution of the ACS sample across block groups, as well as the margins of error reported for the journey-to-work tables. Observations are illustrated with data from individual block groups as well as summaries across block groups nationwide. And while not definitive, comparisons with journey-to-work estimates from the 2000 census long form shed light on the reasonableness of the corresponding ACS journey-to-work data for different types of areas. Among the findings of interest are the number of cells with values of zero, the percent of households interviewed in small towns compared with large metropolitan areas, and the performance of ACS estimates in rapid growth areas.
8.) Sketch Planning Tool for Non-motorized Travel, Phase I: Determining Discriminating Factors of Walk/Bike Friendly Communities - Ho-Ling Hwang

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**Summary**
The idea of livable communities suggests that people should have the option to utilize non-motorized travel, specifically walking and bicycling, to conduct their daily tasks. Forecasting personal travel by walk and bike is necessary as part of regional transportation planning, and requires fine detail not only about individual travel, but also on transportation and neighborhood infrastructure.

Current transportation models lack rigor and reliability either because sufficient data may not be available, or because data integration may not have been tested to combine national data sources with local data sources. The 2009 National Household Travel Survey (NHTS) provides a robust personal travel behavior dataset with more than 100,000 walk trips and about 9,500 bike trips, for persons aged 5 and over, in the sample that can be used to improve estimates for these modes. Furthermore, several Census data sets can be used, directly or indirectly, to supplement the NHTS data and benefit regional planning agencies. This includes the American Community Survey (ACS) data and other Census TIGER file derived data.

This presentation will discuss the use of Census data and initial findings from a project funded by the Office of Planning, Federal Highway Administration (FHWA). This project, which is currently ongoing and will be completed by January of 2012, attempts to characterize the “market” potential for non-motorized travel. Specifically, the main objectives of this project are to: (1) identify factors that influence communities to walk and bike; and (2) understand why, or why not, travelers walk and bike in their communities. Based on results from this project, FHWA may pursue the Phase II study which would be to develop a prototype of a Geographic Information System (GIS)-based sketch planning visualization tool for a select community.
9.) Transportation Characteristics of the Limited English-Proficient Population in the San Francisco Bay Area - Shimon Israel

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Summary
Person and household travel behavior differ across racial/ethnic populations. The presenters use standard tabulations from the 2005-2009 American Community Survey, along with Census Public Use Microdata Samples, to explore characteristics of the limited English-proficient (LEP) population. Data from the Census is used to determine which languages are most often spoken by LEP households, and what are the transportation characteristics of the LEP population. One hypothesis is whether the LEP population is more transit dependent and more likely to carpool than the non-LEP population and, if so, what are the transportation policy and planning implications for this subgroup.
10.) Adventures in ACS: Using 2005-2009 ACS Small Area Data in Regional Transportation Planning - Mara Kaminowitz

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Summary
The Baltimore Metropolitan Council (BMC) is a regional planning agency that represents six jurisdictions in the Baltimore region (Baltimore City, Anne Arundel County, Baltimore County, Harford County, and Howard County). The BMC is the organization of the region’s elected executives who are committed to identifying regional interests and developing collaborative strategies, plans, and programs which will improve the quality of life and economic vitality throughout the region. This includes coordinating highway and transit planning along with promoting “green” transportation and planning practices, public safety programs, traffic modeling, and other programs. The Baltimore Regional Transportation Board (BRTB) is the federally-recognized Metropolitan Planning Organization for transportation in the Baltimore region. The BRTB consists of the six jurisdictions represented by the BMC, the capital city of Annapolis, and three state departments (Planning, Environmental, and Transportation). The Baltimore Metropolitan Council staff provides technical and staff support to the BRTB.

The BMC eagerly anticipated the release of the American Community Survey (ACS) small area data and has been using it to support many of our programs. The population and general demographic characteristics have been used in a number of products aimed at informing the community, press, and non-profit organizations about the region as well as on the neighborhood level. This information has been provided as maps, tables, and web-based community profiles. We also used the population data to get a head start on delineating Traffic Analysis Zones (TAZ) based on the 2010 Census geography.

We have made extensive use of the language data to support transit access for people who speak limited English. We use the data to pinpoint immigrant populations and determine what language that signs and other materials should be printed in.

One of the primary missions of the BMC is to keep track of highway and transit projects in the region. One aspect we look at is Environmental Justice. We want our local jurisdictions and members of the community to be aware if a project affects a disadvantaged community. We have used ACS race and income data to determine the location of vulnerable communities. This information is published in reports and used for public outreach.
The BMC plans to use more of the ACS small area data in the future. The means of transportation and travel time data used in conjunction with other demographic characteristics will be particularly useful in looking at improving transit access for the elderly, low income, and other communities of interest. We also expect to use the data for analyzing the need and effectiveness of transit oriented development. The BMC is currently working on implementing ESRI ArcGIS Server which will allow us to provide dynamic maps and analysis online based on ACS data to our jurisdictions and to the public. The BMC does not currently use the ACS small area summary data for calibrating our travel demand model. However, our travel demand models do use the ACS PUMS to develop custom tabulations that aid in the development of equations for the model.

While the 2005-2009 ACS small area data brings a wealth of information, it comes with serious challenges. The ACS publishes margins of error (MOE) for each data value. Determining how much potential error is too much and how to communicate uncertainty to end users is an ongoing issue. A casual exploration of the data revealed that the MOEs might not be large enough. In 6%-12% of the block groups and tracts examined, the ACS range (value +/- MOE) appeared to be markedly different from the expected value. The American Community Survey and the user community need to carefully evaluate the small area data and assess not just the accuracy of the data values but whether the published margins of error are reliable.

Despite these issues, there is strong demand for small area data and it is not practical to withhold it from our end users and analysts. We use several methods to compensate for potential variability in the data. We aggregate whenever possible either geographically or categorically. Data is sometimes generalized into relative terms instead of exact values to avoid giving a false sense of precision. We are constantly working to communicate the idea that these are survey estimates taken over a 5-year range and should not to be confused with the Census or other enumerative data sets.
11.) Comparison between Census and ACS for License Plate Based Transportation Analysis - Sara Khoeini

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Summary
License plate data are valuable sources of information for approximating socio-demographic characteristics and travel behavior of transportation facility users. However, the available sources of socio-demographic data linked to registered license plates determine the benefits as well as limitations of license plate studies.

The most comprehensive database for socio-demographic characteristics in the United Stated is has traditionally been the long form of the US Census. However, because the Census Bureau discontinued the long form in the 2010 decennial Census, data from the American Community Survey (ACS) is being more widely used in transportation analysis. While the Census long form covered almost 17 percent of the total US population in less than a year, the ACS annual surveys covers only one percent of US population. Because the one percent sample is not a proper statistical representation of the population across small geographic areas, such as when Census block groups are employed as the unit of analysis, the ACS five-year summary file (2005-2009) needs to be used, which covers five percent of the population over a five year time period. Although the accuracy of the 5-year summary file is higher than the 3-year and 1-year files, the fact that the data are collected over a period of time instead of a point of time makes time-series analysis more challenging.

Because many policy and planning decisions are made based on national survey data, the precision and accuracy of these data are very important. This study compares Census and ACS transportation data using license plate data collected in 2006.

In the summer of 2006, license plate data were collected in five key locations in the Atlanta Metropolitan Area. The license plate data collection was performed to assess the socio-demographic characteristics of the commutershed for the I-85 corridor (Atlanta, GA) where the state had proposed to convert the existing High Occupancy Vehicle (HOV) lanes into High Occupancy Toll (HOT) lanes (which opened on October 1, 2011). After matching the license plates to the Census block groups using GIS, the socio-demographic characteristics of the Census 2000 and ACS 5-year summary file (2005-2009) are
assigned to the associated household. Household size, household income, vehicle availability, means of transportation, travel time to work and time leaving home are the characteristics selected for comparison between Census and ACS.

This research explores the distributions of the socio-economic characteristics based upon the 2006 license plate data by using Census data from 2000 and the ACS 5-year summary file (2005-2009). The difference between the results can be due to changes during the previous decade, such as population growth and economic recession. However, different types of data (Census vs. ACS) which have been used for this time comparison can affect the results as well. The study will test the hypothesis that using Census data from 2000 and the ACS 5-year summary file (2005-2009) for analysis of license plate data collected in 2006 does not significantly impact analytical results.

In summary, due to the importance of national data for all policy and planning decisions, the main goal of this study is to assess the sensitivity of transportation-related socio-demographic data to the important change in the national survey method from the decennial long form Census to the annual ACS. Especially in survey-dependent studies, if the sensitivity to data type is high, future research will need to focus on some statistical methods to reduce this sensitivity and increase the accuracy of these types of analysis.
12.) Applying Statistical Disclosure Control to the American Community Survey Microdata Prior to Generating the Census Transportation Planning Product Estimates

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Summary
With the migration to the 2006-2010 American Community Survey (ACS) and current Census Bureau Disclosure Review Board (DRB) data suppression rules, Census Transportation Planning Products (CTPP) would be severely compromised. Therefore, the National Highway Cooperative Research Program (NCHRP) investigated approaches to apply data perturbation techniques that will provide CTPP data users complete tables that are accurate enough to support transportation planning applications, but that also are modified enough that the DRB is satisfied that they prevent the disclosure of individual identities. The research team reviewed a significant amount of previous statistical community research on data disclosure prevention and some previous NCHRP and Federal Highway Administration (FHWA) analyses of CTPP, and settled on a small number of promising data perturbation strategies. These strategies were developed into specific procedures using Census Bureau ACS tables and microdata for four development sites, and the outputs of the different procedures were evaluated and compared in terms of data disclosure limitation and data (table) utility. An optimal approach that used a combination of the tested procedures was forwarded and then validated on two test sites. During the validation, the procedures were further enhanced and coded. The full procedures performed well on the validation site data, so the research team developed an operational set of computer programs that will enable the perturbation to be applied nationally. The CTPP tables that can be derived from the application of the developed procedures will enable transportation planners to make significantly better use of the ACS-based CTPP tables than they could otherwise do.

In the presentation, we report on the perturbation methods and some results of the evaluation and validation of data utility from the selected overall statistical disclosure control (SDC) approach. The approach is a combination of two main procedures. The first procedure is to divide the tables into two
sets. Set A is based solely on original ACS data and not subject to DRB rules, and Set B is generated from the perturbed ACS data. A discussion of what users can expect from this procedure will be presented. The second procedure is to perturb the underlying ACS microdata using two main SDC approaches. The first approach is a model-assisted semi-parametric approach applied to unordered categorical variables, and the second approach is a constrained hotdeck applied to ordered variables. The impact of the procedures on disclosure risk and data utility were measured and evaluated. The risk assessment was approved by the DRB, and the initial data utility evaluation was accepted by the NCHRP project panel.

Also, we are conducting research for the Census Bureau to improve perturbation approaches in general. First, the general research will use microdata from the ACS, and address important demographic or transportation research questions (RQs), requiring data for public policy or research objectives. There are plans to compare approaches to identify high risk data values in the data in order to help determine recodes, variable suppression, and values to target perturbation. Research is also planned to improve the approaches when perturbing spatial outliers and non-spatial outliers. In addition, there is a need to evaluate scenarios to balance the use of weights, with model predictions and the between-locality variance. Lastly, we plan to expand research into the variance estimation approaches developed for the NCHRP 08-79 project. The approach was based on a single dataset that was compared with results from a multiple dataset formula, as well as other approaches.

We also offer thoughts on potential improvements that could be considered for the future. The presentation will include a discussion of the feasibility of a microdata release and a possible online analytic system (OAS) using partially perturbed microdata. The OAS would allow dynamic table queries from restricted use microdata. Initial thoughts on issues and concerns surrounding the options will be presented.
13.) Overview of Place of Work Extended Allocation for the ACS - Brian McKenzie

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Summary
Place of work extended allocation is the process of imputing the block location of American Community survey records for which the respondent's place of work block cannot be determined using standard editing processes. This presentation provides an overview of the set of processes and input files involved in the Census Bureau's current effort to develop an extended allocation process. Place of work extended allocation will be applied to the upcoming 5-year CTPP and future ACS standard products.
14.) ACS PUMS Data and Socioeconomic Modeling - Dmitry Messen

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Summary
Houston-Galveston MPO has been developing an in-house socioeconomic forecasting model. The microsimulation model encompasses biological (aging, survival, birth), social (household formation/dissolution, migration), and economic (labor force participation, unemployment) events. Most of the model parameters (rates) were derived from the ACS PUMS data. The presentation outlines the structure of the model and discusses in detail the use of ACS PUMS data in the model.
15.) Integrated Transportation/Land-Use Modeling: Using publicly available data sources for advanced modeling - Rolf Moeckel

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Summary
Today’s hot topics in urban planning, such as smart growth, high energy prices or congestion pricing, require integrated land-use/transportation models to analyze the impact of different policies. The Simple Integrated Land-use Orchestrator (SILO) is a new land-use model that is sophisticated enough to be fully integrated with a transportation model, yet simple enough to be implemented with limited resources. This implies that SILO is dependent on publicly available data sources, rather than spending a lot of effort on collecting customized data in surveys and data collection efforts to compile information from many different sources. The presentation will describe SILO and methods to import publicly available data into the model.
Summary
The NCTCOG travel demand model covers the 12 counties of Collin, Dallas, Denton, Ellis, Hood, Hunt, Johnson, Kaufman, Parker, Rockwall, Tarrant, and Wise with a total area of about 10,000 square miles. The population of the region has grown from 5,150,396 in year 2000 to 6,417,724 in year 2010, an increase of 24.61%.

This presentation summarizes the results of using the 2000 and 2010 census and ACS data products in the development of a demographic forecasting model at NCTCOG in year 2010. The gravity-based demographic forecasting model was recently recalibrated and validated based on the employment and household data available for the lag and base years of 2000 and 2005, respectively. The model results were later validated for 2010 using both 2010 decennial census and the first ACS 5-year product released in December 2010.

The 2000 household dataset was created based on the decennial census data and modified based on local input. However, the 2000 employment and 2005 household and employment datasets were constructed based on an in-house development monitoring program. This product keeps track of residential and commercial developments in the region and the inputs provided by local governments. The local generation of the 2005 data was in 2007 before the ACS one-year became available. This presentation first explains how use of ACS one, three and five year products assisted with changing the population estimates and validating the performance of the regional demographic forecasting model.

Another use of ACS product in this work was in disaggregation of 242 large district forecasts to 5,303 smaller zones. The disaggregation process used a suitability index for each zone for assigning a relative weight. ACS 5-year product was used to evaluate the performance of the disaggregation process at the Block Group level.

The main issues that were faced during this update were as follows:
- The overall disagreement and resistance of the demographers regarding the use of ACS products;
- The large differences between the household size reported in census 2000 for North Central Texas against the ACS 2005 1-year and ACS 2005-2007 3-year data;

- The significant differences between the household size growth trend in North Texas and the rest of the country; and

- The disagreement of some local governments with the data published by the Census products due to the under-reporting of the minority population or large margin of errors in ACS.
17.) Population Synthesis for Travel Demand Modeling: Data Needs and Application Case Studies - Ram Pendyala

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Summary
As the profession moves increasingly towards simulating activity-travel patterns at greater levels of disaggregation, population synthesis procedures are being implemented within the frameworks of advanced travel demand model systems to generate a synthetic population that is representative of the population of the model region. Over the past decade, a variety of population synthesizers have been implemented in various metropolitan areas, particularly in the context of activity-based travel model development. Population synthesizers generally start with an iterative proportional fitting (IPF) procedure to develop a multi-way distribution of household attributes for the population of a region, while conforming to known marginal distributions on variables chosen to control the synthesis process. Households are then drawn probabilistically according to the estimated multi-way distribution to form the synthetic population. Recent enhancements to population synthesizers involve the ability to control not only for household-level attributes, but for person-level attributes as well. In addition, alternative methods of sampling households to form a synthetic population have been developed with a view to enhancing the representativeness of the synthetic population. Regardless of the methods and algorithms, the use of census databases is integral to population synthesis procedures. With the availability of both decennial census data and continuous American Community Survey (ACS) data, careful consideration must be given to the selection and compilation of census data for use in population synthesizers.

This presentation will offer a review of population synthesis techniques, with particular emphasis on the use of census data for implementing synthetic population generation models. The presentation will provide an in-depth description of a population synthesizer, called PopGen, that has been implemented in a user-friendly open-source software environment. PopGen has been applied recently in two very different contexts, providing considerable insights into the application challenges associated with population synthesis. The two contexts are quite different, with one application in a very large metropolitan region, Southern California, and the other application being in a smaller region, Baltimore and its surrounding areas. The presentation will provide a description of the two population
synthesis applications with particular focus on the census databases that were used for the synthesis. The presentation will include detailed information on model performance and validation. In the Baltimore Metropolitan Council application, a household evolution model that evolves baseline synthetic population households over time has been developed and tested. The presentation will include a description of the population evolution models and the challenges related to obtaining data to support the development of such dynamic models of demographic evolution.
18.) Demographic Analysis of HOV and General Purpose Lane Use Along the I-85 Corridor in Metro Atlanta - Adnan Sheikh

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Summary
The City of Atlanta, Georgia, recently became the latest city to implement value pricing on existing HOV lanes. Researchers at the Georgia Institute of Technology have been involved in an ongoing effort to study demographics of the users of the various lane types before and after the HOV to HOT conversion. This research examines HOV and General Purpose lane use prior to the HOT implementation, with a focus on HOV use as a function of household income and size. The study uses American Community Survey data to analyze demographics of the highway users.

In collaboration with the Georgia Department of Transportation (GDOT), researchers at Georgia Tech collected and analyzed license plate data along the I-85 corridor. Vehicles were recorded at five different locations along I-85, and the resulting license plates were processed to obtain census block group IDs associated with vehicle plate data. With Census block groups in hand, Georgia Tech researchers were able to link demographic information from the American Community Survey 2005-2009 5 year summary file for the census block with the identified plate. The ACS provided median census block group incomes as well as average household sizes.

The data set was unique in its size: the initial number of records, before any refinements to the dataset, was 465,696 for a single wave of collection. Many of these observations, however, did not link to valid license plates. This was likely due to the difficulty of transcribing plates from the recorded video. As the collection wave under examination occurred in the fall of 2010, lighting conditions in the morning sessions were often too dark to properly read the recorded tags. Plates may have also been obstructed by other vehicles. Researchers cleaned the data by removing records with no plates listed, plates without associated income or household data, and incomplete plates. Among the six lanes, 85473 unique license plates were recorded.

Results indicated that users with lower incomes were more likely to use the HOV lane. The distribution plot of lane use as a function of household size did not illustrate any major differences between the two lanes. A number of issues with the study were identified that may have affected results. Character recognition during license plate analysis was imperfect; some plates may have been misread and the
corresponding census blocks would have been misidentified as a result. It was not feasible to determine the exact percentage of incorrect license plates, but anecdotal evidence indicated that it was rare. In addition, income and household size data did not come directly from the households but rather from census block group level estimates, which may significantly limit the accuracy of the results. Further research should be conducted to verify these results using survey data rather than the approximations used here.
Summary
High quality employment data, including workplace location, industry type, the number and demographic characteristics of workers, and the geographic distribution of home-to-work trips, are critical to transportation planning, modeling and policy analysis. For several decades transportation planners have relied heavily on journey-to-work data collected as part of the decennial Census long form questionnaire and distributed through the Census Transportation Planning Products (CTPP) Program to obtain distributions of home-to-work flows. However, replacement of the 2010 decennial Census long form questions by the continuous sample American Community survey (ACS) has raised concerns within the transportation planning community about the adequacy of the sample sizes to provide reliable data on workplace locations and home-to-work flows. Consequently, alternative data sources are being sought.

One alternative, publicly available, nationwide source of data on home-to-work flows at county and sub-county levels of geography is the Census Bureau’s Longitudinal Employment Household Dynamics (LEHD) Program Origin-Destination Employment Statistics (LODES) data. Unlike the CTPP journey-to-work flows, which are based on a relatively small nationwide sample of surveyed households, LODES data are created from administrative records of employers and workers collected by state employment security offices. LODES data therefore more closely reflect a complete enumeration of employers and workers covered by federal and state unemployment insurance laws.

This presentation discusses the strengths and weaknesses of LODES as a potential source of workplace location and home-to-work flow data, and provides findings from a National Cooperative Highway Research Program (NCHRP) study that compares LODES and CTPP data in terms of coverage, completeness and accuracy.
20.) Data User and Provider Panel, “State and MPO Needs: Meeting Federal Requirements and Local Applications”, BETTER DATA FOR BETTER DECISIONS- Martin Tuttle

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None.

Summary
The use and importance of the Census Data, and other data sources, will be presented through California’s response to climate change, poor air quality and an ever increasing population. The California Interregional Blueprint (CIB), as a result of Legislative responses to these challenges, will be introduced along with the new Statewide Technology and Tools to assist in developing the CIB. The CIB will provide the basis for the next update to the California Transportation Plan (CTP 2040) to be completed by 2015. It will analyze the impact of multimodal interregional projects, under consideration in the Department’s and regional agencies’ long-range system and strategic plans, on the transportation system. It also will serve to expand the understanding of the interactions between land use and transportation investments in meeting critical climate goals. The ultimate benefit of this effort will be stronger partnerships, with regional and local agencies and tribal governments, and better data for improved decision making at the State, regional, and local level.
21.) Creating built environment variables in buffers surrounding households: Accuracy of geo-coordinate imputation - Xin Wang

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Summary
This presentation will address the challenge of using aggregate data based on census boundary for travel demand forecasting and transportation planning.

Understanding travel behavior is critical for the development of travel demand models. Census data provides a rich information source about socio-demographic and economic context variables, which are increasingly being used to model correlates of travel demand. Especially, given the new developments in spatial analysis, integrating built environment variables in estimation of disaggregate travel demand models is gaining momentum. To better understand associations between travelers’ behavior and their residential location and surrounding land uses/infrastructure, researchers first calculate built environment characteristics surrounding residential locations and use the variables as correlates in behavioral models. To create new variables in buffers surrounding a residence, exact geo-coordinates of survey respondents’ residences are needed. Unfortunately, conventional travel behavior surveys such as NHTS and census surveys do not publicly reveal the exact residential location of respondents due to confidentiality concerns. In such situations, if the respondent’s zone of residential location is known, then zonal average socio-demographic measurements can be used as correlates in models to represent the average land use variables surrounding a specific residential location. However, using zonal averages can create measurement errors, and reduce the local variation that may exist in reality.

Geo-coordinate imputation can overcome the problem of not knowing the exact geo-coordinate location of a household. It can assign household to an exact geo-coordinate location (lat-long). This study explores if such assignments of geo-coordinates are relatively accurate and if so what are the implications. Data from household travel surveys conducted in Charlotte, and Triangle area, North Carolina during 2003 and 2006 respectively was used to study this issue. Exact geo-coordinates (referred to as lat-long) of residences were available to the research team, which can be used to compare them with synthetically assigned residential locations. All households were also geo-coded at the TAZ—the level typically available to researchers, and to the census block level—the finest level that may be
available to researchers. Given the number of residences in each TAZ or block, the same numbers of residences were assigned to a location within the TAZ or block semi-randomly by constraining them to existing roadways excluding freeways, bridges and ramps. The imputation results were compared statistically by examining roadway lengths within buffers created for synthetically assigned residences vs. actual residential locations. If the random assignments can create equivalent synthetic residences that are not statistically significantly different from real residences in terms of roadway lengths in local neighborhoods, then the randomly assigned lat-long can be used to replace actual residential locations. By doing so, the confidentiality issue can be overcome.

The results indicate that synthetic assignment of residences using TAZ information is not equivalent to having actual household locations when analyzing roadway length in 0.25 mile buffers around residences. More specifically, there is a statistically significant difference (5% level) between actual residences and synthetically assigned residences, in terms of the roadway length in 0.25 miles buffers around residences; however, the difference is not statistically significant for larger buffer sizes including 0.5 miles and 0.75 miles buffers. Moreover, larger differences between synthetic assignments and actual residential locations are concentrated in suburban areas. Note that TAZs are relatively larger in suburban areas, providing relatively higher freedom of choice when residences are assigned randomly.

The research team is conducting synthetic assignments at smaller geographic units, i.e., census blocks and recalculating the roadway length in 0.25 mile buffers. The initial results for block level synthetic assignments show that using smaller geographic units can reduce the differences in surrounding roadway lengths between actual and synthetic residential locations. Whether synthetically assigned residences can be used as a substitute for actual residences depends on their location. Charlotte, NC data showed that there was no statistically significant difference in block average roadway length in 0.25 miles buffers between synthetically assigned residences and actual residential locations, while the difference was statistically significant for the Triangle Area in NC. The inconsistency between these two study areas may be partly due to their different urbanization levels, given that the differences between roadway length in buffers are concentrated in suburban areas.

The study assessed the extent of errors when using the synthetic geo-coordinate imputation method. Overall, the results suggest that the extent of errors in geo-imputation depend on the geographical unit used to assign residences (TAZ or block) as well as the buffer sizes around the residences. Moreover, there is a trade-off between the analysis needs and computation burden, since finer-level geo-imputation increases computation burden dramatically. Also, geo-imputation works better in urban areas than suburban areas. To generate built environment variables, such as roadway length around residential locations, TAZ based geo-imputation is accurate enough to create synthetic residences in an urban area. However, for suburban areas, finer levels of geographical units may be needed to obtain more accurate results. To increase the accuracy of geo-imputation, further efforts are needed to add more constrains on synthetic assignment, e.g. residential density. Also, future research is needed to evaluate whether using built environment variables obtained from geo-imputation can improve model estimation than using zonal average.
22.) Monitoring Growth Vision Progress in the Transit-Oriented Communities Using Performance Indicators - Frank Wen

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**Summary**
This study intends to monitor growth vision progress in the transit-oriented communities of the Southern California region using a range of performance indicators. Diverse performance indicators (e.g., ethnic segregation, income level and distribution, transit use, accessibility, smart growth, housing affordability, transportation cost, per capita VMT, per capita GHG emissions, etc) will be derived to measure growth vision progress of TOCs towards becoming more desirable communities to live using diverse dataset including ACS, ACS PUMS, CTPP, NHTS, and the other Census data, and the statistical modeling process.

To respond to the land use and transportation challenges (e.g., sprawl, traffic congestion, air pollution, housing affordability), Southern California Association of Governments (SCAG) has launched a Compass Blueprint Growth Vision program in 2000. Visioning was used with citizen participants to identify preferred types of development and patterns of growth. As a result of the visioning process, SCAG Regional Council adopted the regional growth vision principles and strategies in 2004. Four key principles include: (1) mobility - getting where we want to go; (2) livability - creating positive communities; (3) prosperity - long-term health for the region; (4) sustainability - promoting efficient use of natural resources.)

As required in California Senate Bill 375, TOD in Transit-Oriented Communities (TOCs) of the Region will be promoted as major land development tool to achieve the goals of reducing Greenhouse Gas (GHG) emissions by its proximity to transit and by its consistency with the Sustainable Communities Strategy (SCS) in the regional Transportation Plan. Given the increasing importance of TOD in an auto-oriented urban form of Southern California, the regular assessment of the performance indicators of economic, social and environmental wellbeing of TOCs located around the transit station is much needed.

The major sources of the data to be used will be the decennial Census data for 2000 and 2010, American Community Survey (ACS) 5-year 2005-09 estimates at the block group level, 2008 National Household Travel Survey, and Census Transportation Planning Package 2006-2008, and CTPP. The study also uses the results of the statistical models reflecting the impact of different land use and socioeconomic changes on vehicle miles traveled (VMT), GHG emissions, and other derived impacts to measure the
progress.
23.) Validation of Person Trip Tables for Transit Forecasting - Jinghua Xu

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Summary
This presentation will focus on the validation of the HBW trip patterns based on the CTPP worker flow data. The validation was performed in the course of updating a mode choice model to meet FTA New Starts guidelines and current best practice. Model validation includes two separated, but related activities. One activity is to compare the CTPP and estimated trip distribution patterns geographically and by different demographic characteristics. The second step is to revise the model so as to improve its representation of the observed travel pattern. This presentation discusses the methodologies used to adjust the person trip generation and distribution procedures to better match the observed worker flow distributions. CTPP data other than worker flows were used to perform the various model adjustments.