Control total progress report

a. Frank Lenk, MARC’s Director of Research Services, provided an update on the next forecast. He said that MARC will adopt the next the long-range regional transportation plan in 2020. The forecast of the amount and distribution of future population, employment, and households is a key input to the transportation plan. Mr. Lenk said that we’re adopting the cloud service, block-based version of the UrbanSim model. We’ll be able to test scenarios once we create the regional growth control totals.

b. Mr. Lenk reviewed the previous forecasts. In 2010, the Technical Forecast Committee created an ‘adaptive’ scenario with a net 14% of population growth occurring as refill inside the 1990 developed area, or the ‘redevelopment area.’ In 2012, the TFC reduced expectations for the amount of redevelopment to 5%. Comments:
   i. KCMO observed a lot of recent redevelopment in the core.
   ii. Overland Park is working on a new ‘Forward OP’ plan. Downtown development has been active in the last 3-4 years, following the recession.
   iii. Mr. Lenk remarks that single-family development hasn’t recovered in the region overall.

c. Control totals:
   i. Mr. Lenk displayed REMI data showing past and forecast regional employment and population change from 2000 to 2060. In the REMI data, employment change is flat between 2020 and 2025. Migration, international, is expected to be KC’s share of national migration. In the REMI data, economic migration is expected to rise dramatically, but Mr. Lenk sees a lack of good explanation for this, and he doubts the REMI migration models. Migration data by age from 2007-2013 shows a large out-migration of ages 18-19, meaning that we lose about 8,000 to college, and the region only gets about 4,000 of those people back.
ii. Mr. Lenk suggested the following solution to the shortcomings in REMI’s model. First, BLS recently came out with a new U.S employment forecast to 2026 that does not show the extreme flattening of growth that REMI does, though the average annual growth rate of 0.7 percent is significantly reduced from historic trends, reflecting slowing labor force growth as baby boomers retire. Second, Mr. Lenk suggested that net migration be calculated outside the REMI model using an accounting approach rather than a set of regression equations. This approach was used in MARC’s predecessor to REMI, which was called IPEF (Integrated Population and Employment Forecasting model). In this approach, the employment forecast determines the labor demand (modified to account for the fact that some people hold more than one job). The aging of the population (births minus deaths) plus projected labor force participation rates by age (either from REMI or BLS) plus an assumed unemployment rate determines labor supply. Worker migration is then assumed to occur to equilibrate the two. Net migration rates by age are then applied to convert workers into total population. This approach assumes the rest of the world provides a vast pool of potential labor, so that if demand exceeds supply, workers move in, but if supply exceeds demand, workers move out. Historically, this kind of model has done a better job of forecasting net migration than REMI’s migration equations.

2. Small-Area forecast
   a. Mr. Lenk said that we have outputs from initial UrbanSim calibration test forecast runs. He explained that the UrbanSim model is making household and housing unit forecasts by income quartile, and the model for the first quartile (low income) was reviewed. This particular model used the following variables: median value of homes, jobs within 10 km., post-2010 units within 800 meters (how new is housing in area?), density of units, mean income, building type, and vacancy rate. Other quartiles likely use similar variables, but there is a potential for each model to use slightly different ones.
   b. Results of the model run were then calibrated to match county growth between 2010 and 2013. However, the resulting forecast of household change was distributed too evenly across the region. It did not reflect the pattern of the last couple of decades where the bulk of the region’s residential growth occurs in the developing suburbs, and most of the existing areas experience stability while some targeted areas, such as around Downtown, experience redevelopment and those areas most impacted by poverty experience declines.
   c. In response, UrbanSim staff then developed a methodology to estimate and use place types to include such recent trend information in the model. To create place types, regressions were run to estimate the variables important in explaining recent household change. Those variables were then used to cluster all tracts into a limited number of non-contiguous groups, each group becoming a place type. The tract place types were then used as dummy variables in the model equations.
d. Note that UrbanSim staff used the change between 2006-2010 and 2011-2015 non-overlapping 5-year ACS datasets as the estimate of recent tract-level household change as the regression models' dependent variable. Mr. Lenk said that the ACS data contain some noise associated with random sampling. Analysis of the data shows a greater mix of growth and decline in all parts of the region than has typically been shown in succeeding decennial censuses. In stable areas cases, the random error may be bigger than the expected change. This may affect the quality of UrbanSim’s calibration using place types.

e. Next, Mr. Lenk reviewed the results of the household forecast once place types are included. This was completed for four types of households and for four kinds of housing units. The model results, for 2010-2020 household change, had more realistic distribution of growth than the test created without place types, but growth was low in western Wyandotte County, and still no tracts were projected to decline.

1. Suggestion: use density variables for better results, or add in size of tract as a variable
2. Comment: Some of the UrbanSim place types do not make sense.

f. Initial tests were conducted by UrbanSim staff only for households. No place types based on employment change have yet been calculated.

g. Since place types improved the model but appeared to have room for improvement, MARC staff created additional versions of place types to try with UrbanSim calibration. Ms. Repinsky shared the results of testing UrbanSim’s tract variables within the Esri Exploratory Regression tool to find well-performing and non-redundant variables within regression models, with 2000-2010 Census tract household change as the dependent variable. Well-performing variables were used within Grouping Analysis to test numbers of groups and combinations of variables. One version shared with the committee contained 4 groups and seven diverse and well-functioning variables (proportion of housing built post-1995, household change 2000-2010, mean income, total workers, total households, density of residential units, and race of head of household). The resulting groups had meaningful differences among the profiles of mean variable values among included tracts. Also, the number of groups was reported by the grouping analysis tool to be one of the most effective number—four groups, using these variables, had one of the highest pseudo F-statistics, which is a ratio of within-group similarity and between-group differences. MARC staff will continue to refine the variables and groups.

h. Review of other UrbanSim input data

i. Transportation analysis zones and travel skims, or the travel time from each zone to all other zones, are complete and furnished to the model.

ii. Development capacity data is nearly complete. Since regional zoning data are not available, future land use plans will serve as a source for the maximum possible population, household, and employment density within UrbanSim. MARC staff completed collection of all available future land use plan and merged them into one consistent regional dataset. Future land use was merged
with existing land use in developed areas, to allow current parcel size and land use to provide more detailed constraints than the generalized future land use plans, with the assumption that parcel size will be generally stable over the forecast period. TFC participants are asked to review and refine the data, to show where large parcels have additional development capacity.

iii. **Individual development projects** are used for model calibration. MARC staff reviewed available data sources and found that the licensed CoStar database is the best option, though TFC participants may also submit planned and current development projects that are not in Costar.

3. **Activity center update**
   
   Ms. Repinsky and Mr. Rivarola said that the activity center data developed through the TFC is currently being updated. Ms. Repinsky reminded attendees that the center boundaries are created with non-single family residential building footprints, and then classified by intensity of development and walkability. Mr. Rivarola described how the activity center data was used as one of several scoring criteria in the evaluation of proposed transportation projects. MARC staff are updating activity center data with recent building footprints, and updated street, business, employment, transit, and land use data.