POPULATION AND EMPLOYMENT FORECAST FOR 2030 BY QUARTER SECTION IN CHICAGO: METHODOLOGY

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Extended Abstract
Large metropolitan areas exceeding one million people are required by the federal government to submit a 30-year transportation plan. The plan requires population, household, and employment forecasts by quarter section (4 by 4 city blocks). These forecasts are required for federal funding of highways and public transportation. Most of the municipalities and cities in the Chicago region prepare these forecasts. The Northeastern Illinois Planning Commission (NIPC) provides technical support, evaluates, and combines these forecasts into a regional one. As outlined below, for the City of Chicago, a citywide population forecast using the cohort component method and a quarter section population and employment forecast using land use were prepared. The findings are summarized in a report.

The citywide population forecast was prepared using the cohort-component method. It uses 5-year age intervals and three major groups: African Americans, persons of Hispanic origin, and the remainder. In- and out-migration rates and international migration were projected separately, based on 1995-2000 data for Chicago from the 2000 Census. Age-specific fertility and mortality rates by race and Hispanic origin were calculated for Chicago for the year 2000. Future rates were derived using changes expected nationally. Our report analyses migration streams and vital rates over time and relative to national data. It includes the age, race, and gender structure of the future population of Chicago. The previous forecast for 1990-2020 is described in a similar report prepared 10 years ago.

The quarter section forecast is based primarily on Census data and on land use data. Current land use, including vacant land, was determined by interpreting aerial photographs. Future land use was predicted from extensive interviews conducted with city planners. To prepare the forecast, the central business district and the neighborhoods were considered separately. The city maintains a list of developments covering nearly all vacant and underused parcels in the central business district. This list led to a good preliminary forecast because these central developments tend to be large and have a long lead-time. In the neighborhoods, the zoning code was used to identify three types of areas: residential areas, major commercial and business streets, and industrial corridors. To start, we took into account all known developments, including those under construction, approved, proposed, abandoned, or envisioned, as well as those finished after the year 2000. Next, we focused on the industrial corridors. Here, available parcels tend to be large and each one is assigned a city planner who provided us with information on its likely future use. In general, a shift from manufacturing to services, high-tech industries, and research and development is expected. Next, we focused on major commercial and business streets. For decades, the city has had excess commercial space that was created before shopping malls existed and has resulted in boarded-up stores and abandoned walk-up apartments. This is expected to change: a new zoning ordinance now allows residential development along these streets. Discussions with planners led to forecasts of increased concentrations of retail near major intersections and increased residential density elsewhere along these streets. Lastly, we

focused on the residential areas. The city has many scattered vacant parcels, too many to consider separately. Their combined land area was determined at the community area level. The interest shown by developers in each area was used as a leading indicator for future development and used to predict which fraction of the vacant parcels would be filled in.

The data necessary for the forecast come from different sources and use different spatial units. While the 2000 base data and the 2030 forecast use quarter sections, the land use data use arbitrary polygons with uniform land use. To combine these data, we used GIS techniques and software called Paint the Town specially designed to prepare such forecasts. Several databases were used. 2000 Census block data were used to create quarter section counts of population, households, group-quarter populations, and vacancy rates. Unemployment insurance records from the State of Illinois, supplemented with data covering public employment and the self-employed, resulted in employment data by industry by quarter section. Interpretation of aerial photographs resulted in the land use data. In addition, several layers of spatial context were added. These included transit lines, railroads, the existing regional transportation plan, the street grid, enterprise zones, tax increment financing districts, etc.

The various developments had to be recorded: the land they occupy and the population, households, and employment they are expected to generate. Unfortunately, the number of developments was large (more than 500 in the central business district alone) and to simplify we restricted ourselves to a number of standard developments that were entered into a palette built into the software. For each residential development in the palette, the number of units per acre, the household size, and the vacancy rate had to be specified. For each non-residential development in the palette, the number of square feet per employee and the floor-to-area ratio or the number of jobs per acre and the vacancy rate had to be specified. For instance, standard residential developments vary widely: they include walkup apartment buildings as well as high rises with 395 units per acre. Non-residential developments vary even more widely: they include large stand alone stores, storefronts with walkup apartments, nursing homes, medical clinics, and many more. To record a proposed development on the map, one delineates the area by using GIS editing tools and then opens the palette and selects the standard development closest to the proposed development. One can also specify the population, households, and employment lost. The software then calculates the acreage and the net change in the number of persons, households, and employment. It also prepares summaries at the quarter section and community area level.

Besides the proposed developments, other changes are expected to affect the base data in terms of household size, vacancy rate, and group-quarter occupancy. Generational changes with young families replacing smaller elderly households are expected to continue and to have an impact on household size. These changes correlate with ongoing racial and Hispanic changes that were used to forecast household size. Residential developments generally improve a neighborhood's overall condition and are expected to lower the high vacancy rates recorded in some areas. Finally, the group-quarter population in the existing facilities is assumed to increase slightly. Because of a limitation built into the software, the changes affecting the base data can only be made at the city level. Therefore, each of the 77 community areas in Chicago was treated as a town.

The forecast together with the regional transportation plan will be presented to the public in neighborhood meetings where officials, community leaders, developers, and residents will be invited to make comments and suggestions. For each neighborhood, a report describing the demographic, socio-economic, and housing characteristics, as well as maps showing current and future population density and land use, will provide a basis for discussion.