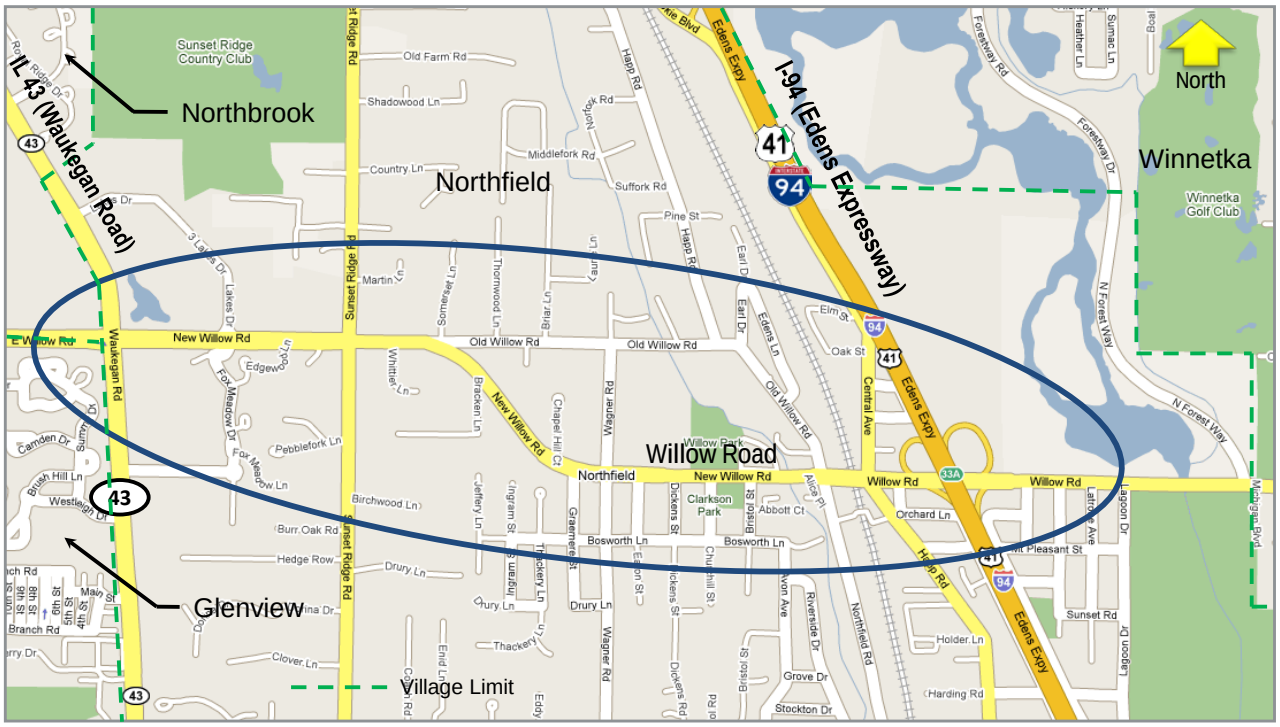
Draft Existing Travel Pattern Analysis

Willow Road Study
Illinois Route 43 (Waukegan Road) to Interstate 94 (Edens Expressway)

Illinois Department of Transportation
Project Number: P-91-411-08



September 15, 2010

1. INTRODUCTION

The purpose of the existing travel pattern analysis is to assist the Willow Road project study group, Community Advisory Group (CAG), and other stakeholders in understanding travel patterns both within the study area and beyond, and in doing so, respond to the CAG's expressed comments regarding local and regional travel patterns.

The process used to perform the travel patterns analysis is based upon the Chicago Metropolitan Agency for Planning's (CMAP) regional travel demand forecasting model. CMAP is the designated Metropolitan Planning Organization (MPO) for the northeastern Illinois region (Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will Counties) and develops the long-range Regional Transportation Plan (RTP) (the current 2030 RTP and the new GoTo2040 Comprehensive Regional Plan that is expected to be adopted in October 2010) and the Transportation Improvement Program, which lists the federally funded projects and regionally significant, non-federally funded projects programmed for implementation in the next few years.

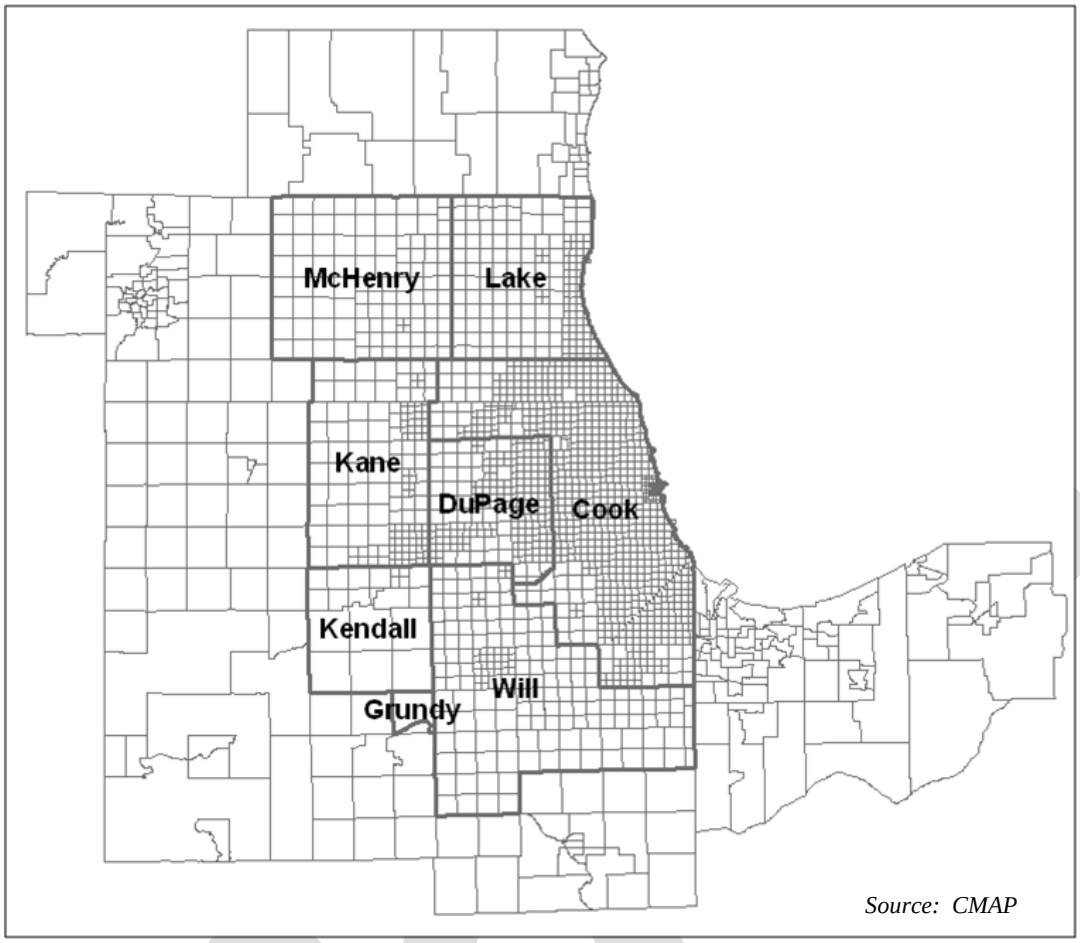
2. OVERVIEW OF CMAP'S TRAVEL DEMAND MODEL

A travel demand model is a computerized planning tool used to forecast travel demand. The CMAP travel demand model is used to support the development of the Regional Transportation Plan; evaluate travel behavior in response to demographic and transportation network changes; evaluate proposed transportation improvement projects; and perform air quality conformity analyses. CMAP, and its predecessor the Chicago Area Transportation Study (CATS), has a long history of travel demand modeling in northeastern Illinois, dating back to the 1950's when they developed one of the first travel demand models in the nation. Over time, their regional models have been updated and improved. Today, CMAP's travel demand forecasting methodology is accepted by the Federal Government, IDOT, county, and local governments.

The area covered by the CMAP regional travel demand model includes seven counties in northeastern Illinois plus adjacent areas in northeastern Illinois, southeastern Wisconsin, and northwestern Indiana (see Figure 1). The CMAP travel demand forecasting model includes:

- *CMAP Traffic Analysis Zone System*: CMAP's regional travel demand model area is divided into 1,961 smaller geographic areas referred to as Traffic Analysis Zones (TAZ). A TAZ provides the basis for organizing socioeconomic data about the region. The sizes of the zones within the regional model vary, but for most of Cook County, including the study area, the TAZ size is a section area or one square mile area.
- *Socioeconomic Data*: A database containing information on the number of households, household characteristics, and employment for the region.
- *CMAP Regional Transportation (Roadway) Network*: CMAP has developed a digital version of the regional roadway network that includes expressways, tollways, arterials, collectors, and also some local streets, as well as their characteristics (distance, number of lanes, capacity, posted speed, etc.). The network is designed to represent travel route choices within the region.
- The CMAP regional travel demand system also includes a collection of *statistical techniques and tools* used to estimate:
  - *Trip Generation* – Number of trips produced in and attracted to a TAZ;
  - *Trip Distribution* – Number of trips that move between all pairs of TAZs (output in the form of a square matrix also called a trip table);
  - *Mode Choice* – Mode of travel, e.g., car or bus used for travel between TAZs; and
  - *Trip Assignment* – The path or route choice used to complete a trip between TAZs

Figure 1: CMAP Travel Demand Model Region



Full documentation of the CMAP regional travel demand model is available at: http://www.goto2040.org/plandocs/appendices/.

3. WILLOW ROAD SELECT LINK ANALYSIS

The process used to perform the travel pattern analysis is called a "select link" or "critical link" analysis. Select link is an analytical tool that allows the modeler to identify trips that use a particular segment of roadway, i.e. the selected link. The process involves selecting a link (roadway segment) within the network, running a trip assignment using a trip table that reflects either daily travel or travel for a particular time of day, and using the results of the assignment to identify the origin TAZ, destination TAZ, and travel paths of all trips that used the selected link. Note that the origin TAZ and destination TAZ for any trip can jointly be referred to as trip ends, i.e. every trip has two ends, and will be referred to as such hereafter.

A 2010 select link analysis based on the CMAP travel demand model was conducted for Willow Road. The segment of Willow Road chosen for the select link analysis is located between Old Willow Road east of Sunset Ridge Road and Wagner Road, as shown in Figure 2. This two lane section of Willow Road is in the center of the Willow Road project study corridor and is surrounded by a residential neighborhood. It has an existing annual average daily traffic (AADT) of

25,700 vehicles per day. It was selected in order to determine the travel patterns, i.e. trip ends and travel paths of traffic that uses Willow Road in the project study corridor.

Figure 2: Willow Road – Select Link Location

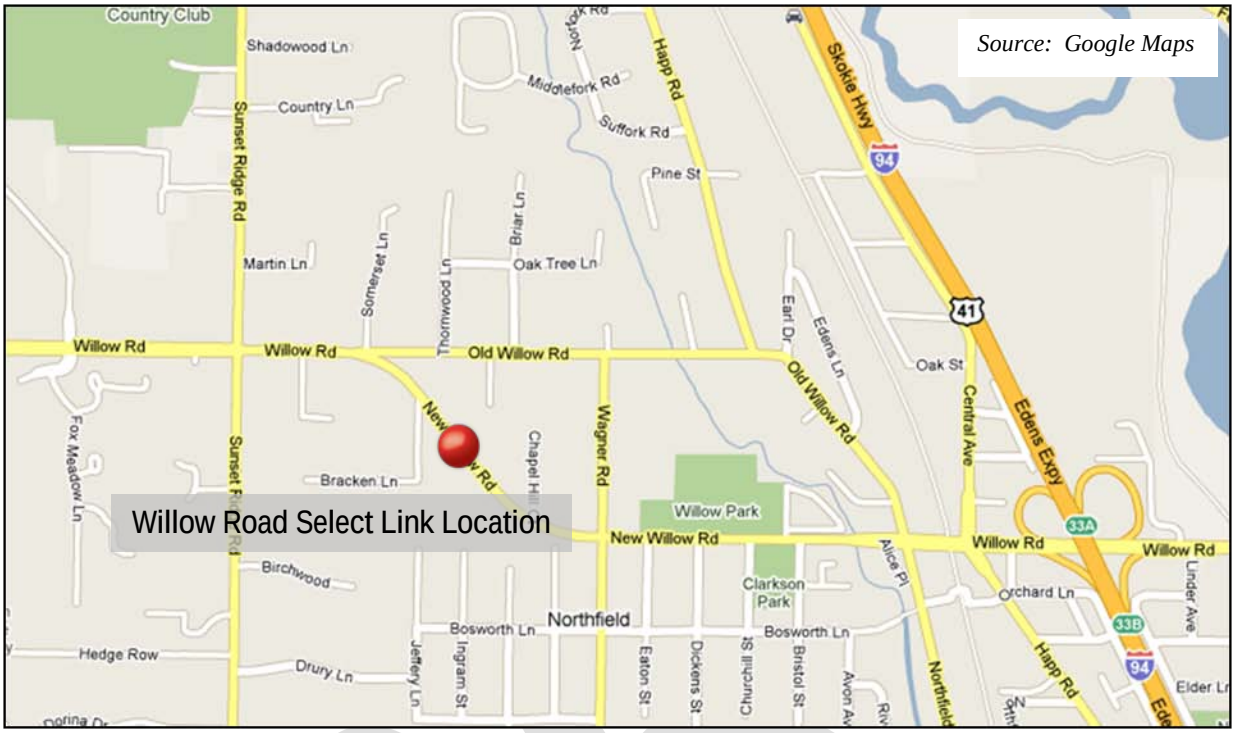
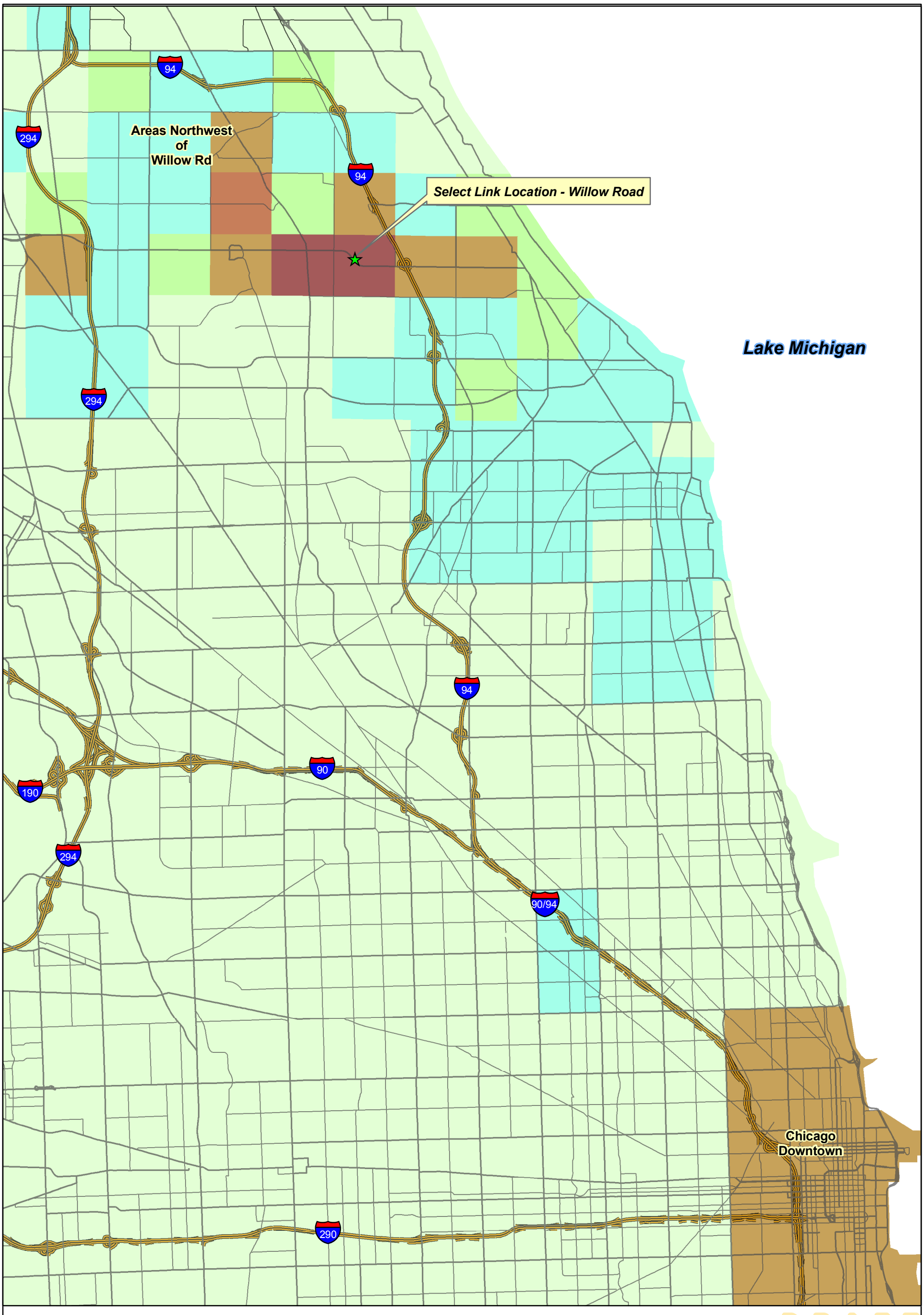


Figure 3 shows the travel patterns that resulted from the select link analysis for Willow Road. The results are summarized below.

Travel Patterns for the Select Link Location

- The largest concentration of trips ends (origin or destination), approximately 40 percent, are along the Willow Road corridor between east of the Interstate 94 (Edens Expressway) interchange and just to the west of Illinois Route 43 (Waukegan Road).
- The predominant orientation of trip ends is northwest-southeast.
- The trip ends to the northwest generally are bounded by I-294, the Edens Spur, Winnetka Road, and the Edens Expressway.
- The traffic heading to the southeast has trip ends in downtown Chicago and the North Shore area.
- East of the select link location, the trip ends are split evenly between Chicago downtown, east of Interstate 94, and southeast of the Willow Road corridor.
- West of the select link, the travel patterns are also evenly dispersed. More than 50 percent of trips have trip ends northwest of the study location, with roughly 20 percent south and 15 percent north of the study area, and 15 percent west of Landwehr Road.



Note: Total Trips represented by the color theme for downtown Chicago describe the patterns for the general boundaries and do not represent specific locations or zones in these regions.

Figure 3
Select Links Analysis - Willow Road