

Two of the performance metrics evaluated during the alternatives analysis for the NDLSO Phase I Study are mode share and mode shift. Mode share is the relative proportion of trips used by each travel mode in the study area (auto, transit). Mode shift is the relative change in the number of trips from one mode to another mode. The official comprehensive regional plan prepared by the Chicago Metropolitan Agency for Planning (CMAP) promotes regional transportation policies that encourage higher transit mode share and mode shift. These criteria were analyzed for each NDLSO alternative by CMAP using their current travel demand model. As detailed in the Level 3 Screening Performance Criteria Study Spotlight, the presence of bus queue-jump lanes on ramps (Essential Alternative), dedicated travel lanes on Outer Drive for buses (Exchange and Addition Alternatives), and dedicated travel lanes on Outer Drive for buses/tolled autos (Flex and Double Flex Alternatives) result in modeled performance differences between each of these alternatives for bus and auto travel times and reliability. However, CMAP's travel demand model forecasts that the changes in mode share and mode shift resulting from these performance differences among the alternatives would be very small, with no alternative exhibiting statistically significant modeled changes in either metric.¹

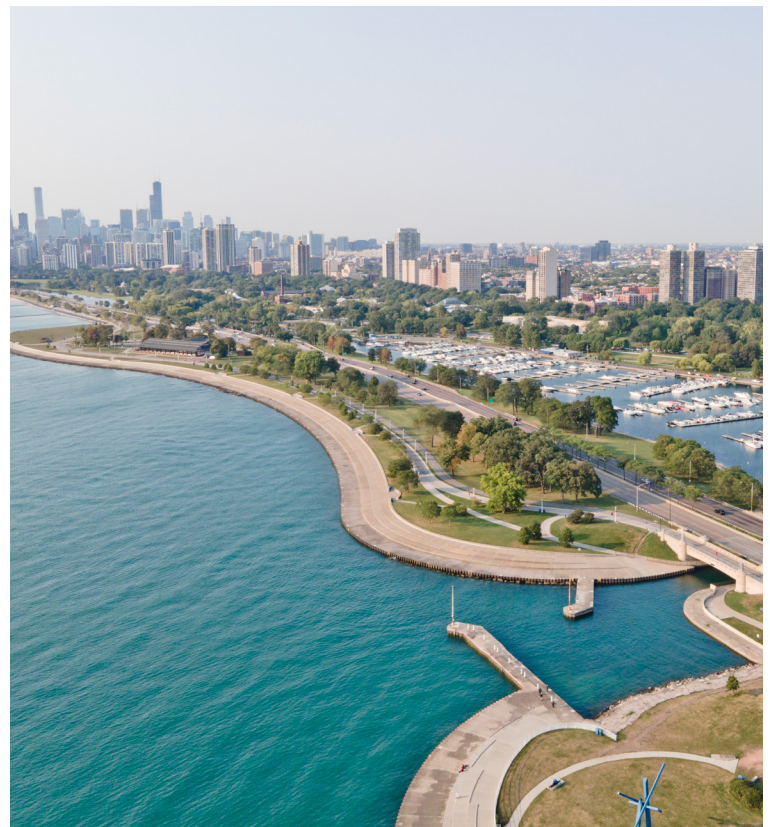
To more fully understand these results, the project team requested additional detail from the CMAP travel demand model regarding trips, as travel behavior at the trip level directly relates to the overall mode shift and mode share results. Trip data considers demographic and socioeconomic characteristics that generate potential start point of trips (origins) and end points of trips (destinations) across 3,500 analysis zones in the Chicago metropolitan area. The travel demand model then assigns these trips by mode to the roadway and transit networks based on minimizing the travel time for each individual trip, with modifications for factors such as cost, accessibility, and capacity of network links (such as street and highway segments or transit routes). This Study Spotlight summarizes the analysis of trip data to better understand travel behavior related to the NDLSO corridor. For additional details regarding the overall Phase I Study, please visit the project website at northdusablelakeshoredrive.org.

¹ The modeled changes in mode share and mode shift for each alternative varied by less than 2% from existing conditions, and the model's margin of error is 3%.

ORIGINS AND DESTINATIONS OF TRIPS USING NDLSO

Origin and destination data were extracted from CMAP's travel demand model to identify characteristics of southbound NDLSO express bus trips as well as southbound auto trips during the morning peak period (7 a.m. to 9 a.m.) along the busiest segment of the Outer Drive, between LaSalle Drive and Fullerton Parkway. All data were taken from the 2050 No Action scenario, which incorporates any changes in transportation demand or travel patterns based on the policies and proposals in CMAP's ONTO 2050 regional plan, but without any geometric or access changes to NDLSO. Under these conditions, the model forecasts 3,800 trips using NDLSO express buses and 11,800 trips using autos during the morning peak period. Modeled transit trip data for the CTA Red Line were also assessed for inbound trips to the Central Business District passing through Clark/Division station; the model forecasts a total of 49,500 trips using this transit service during the same morning peak period.

Figures 1 through 3 illustrate these modeled trip data mapped by mode. Each 'block' represents one traffic modeling zone in the CMAP regional travel demand model. The intensity of color for each zone in the figures represents an increasing number of trip origins or destinations, as detailed in the legend. A minimum threshold of five trip origins or destinations per zone was used to highlight the areas that contribute trips in the analysis.



NDLSD Express Bus Trips

As shown in **Figure 1**, the area from which the modeled NDLSD express bus trips currently originate is relatively compact and concentrated primarily along the north lakefront near NDLSD itself. Although the maps show some trips originating along major east-west bus corridors such as Belmont Ave, Irving Park Road, and Devon Ave, the shading indicates that the density of demand away from the lakefront itself is relatively sparse, and that it extends only a few miles to the west and up to the city limits on the north. The southern extent of the NDLSD express bus trip origins is Fullerton Parkway, which corresponds with the southern-most NDLSD express bus entrance point onto the Outer Drive. The highest concentration of express bus trip origins is generally east of Halsted Street/Broadway (in the Uptown and Lakeview neighborhoods) and east of Clark Street (in the Edgewater neighborhood). In total, the approximate area from which modeled NDLSD express buses originate covers about 18 square miles.

The modeled destinations of NDLSD express bus trips are highly concentrated in the Near North neighborhood and the northern part of the Loop, with a pocket of trip destinations in the Museum Campus/Soldier Field area and very sparse pockets elsewhere within a few miles of the Loop. The model showed no NDLSD express bus trip destinations south of 35th Street or west of Ashland Ave.



CTA Red Line Trips

The model indicated that origins for CTA Red Line north lakefront trips, as shown in **Figure 2**, are concentrated within walking distance of the north Red Line but also distributed over a much wider area of the north and northwest parts of the City than modeled express bus trips on NDLSD. These origin locations for Red Line trips appear to be limited by the length of connecting east-west bus transit lines and locations along the connecting Purple and Yellow rail transit lines. In total, the approximate area from which modeled CTA Red Line north lakefront trips originate covers about 27 square miles.

The destination zones for Red Line trips along the north lakefront are concentrated in the Loop and Near North neighborhoods. However, there are also significant numbers of trips with destinations throughout most of the City's south side along the Red and Green Lines, in the Near West Side, and transfer trips along bus and Metra lines to the south, including some trips as far as the industrial areas around Lake Calumet and eastward into northwest Indiana.²



² Note that the modeled Red Line rider travel patterns shown in this analysis reflect implementation of CTA's ongoing Red-Purple Modernization (RPM) project and CTA's planned Red Line Extension south to 132nd Street, both of which are assumed to be complete by 2050 per CMAP's ONTO 2050 regional plan.

Auto Trip Origins and Destinations

Figure 3 shows the area from which NDLSD auto trips originate. This area encompasses approximately 34 square miles spread across the north side of Chicago and the north suburbs, extending nearly to I-94 on the west and suburban Kenilworth and Wilmette in the north. The destinations of these trips, while somewhat concentrated in the Near North neighborhood and the northern part of the Loop, are also spread across a wide area to the south and west of the city and suburbs, with destinations as far west as suburban Oak Brook, as far southwest as suburban Hickory Hills, and as far south as 119th Street.



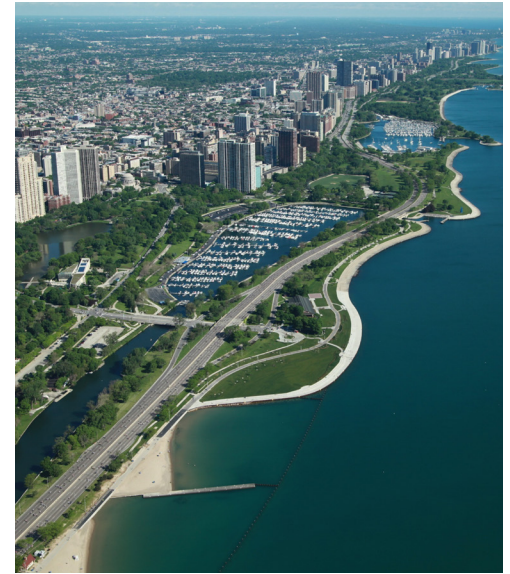
TRAVEL MARKET ANALYSIS

After assessing where trips that utilize NDLSO begin and end for each mode, the project team then analyzed interactions and overlaps between the various travel patterns by mode.

Transit Market

There are two primary north-south transit options within Chicago's north lakefront corridor, the CTA express bus routes that operate on NDLSO and the parallel CTA Red Line. When NDLSO express bus performance is improved some transit users will be drawn from the Red Line to the parallel express bus services. However, when transit riders change from using one transit service to another it does not result in any changes to mode shift or mode share. To investigate this potential, the study team identified overlap between zones containing NDLSO express bus origins and destinations and zones containing CTA Red Line origins and destinations. As shown in **Figure 4**, there are no zones containing modeled NDLSO express bus origins and destinations that are not also zones containing modeled CTA Red Line origins and destinations.

The lack of any independent origins and destinations between the two transit services (no colored zones for either origins or destinations in **Figure 4**) shows a complete overlap of the travel market for CTA express buses using NDLSO with that of CTA Red Line trains. Therefore, it is likely that all else equal, **when the performance of NDLSO express bus routes improves, some riders will be attracted away from the Red Line, and vice versa.**



Transit Accessibility for Auto Users

Another factor affecting the magnitude of forecast changes in mode share and mode shift is the availability of transit as a viable travel option between certain trip origins and destinations. **Figure 5** shows zones in the model that have trip origins for autos using NDLSO but no trip origins using any mode of transit along the north lakefront to the destination zones of the auto trips; in other words, the trips highlighted in these zones are exclusively choosing an auto to begin their trip that uses NDLSO. As shown in the figure, there are many areas in the near north suburbs where transit travel via the north lakefront is demonstrably not a reasonable travel option for travel to the indicated destination zones further south, and therefore transit is not being chosen as a mode of travel.

Conversely, **Figure 6** shows zones in the model that have trip destinations for autos using NDLSO but no trip destinations using any mode of transit along the north lakefront from the origin zones of the auto trips. As with **Figure 5**, it may be noted that many of the trip origin and destination zones in this figure have transit options available, however, the trips between these zones are not reasonably served by transit travel via the north lakefront (either NDLSO express bus routes or the CTA Red Line). These destination zones are primarily south and west of the City, where transit service is less directly accessible from the north lakefront.

Because transit travel along the north lakefront is not a reasonable travel option for the origin and destination pairs depicted in Figures 5 and 6, performance enhancements to the lakefront transit services would have little if any impact on transit travel demand for these trips—despite NDLSO being a reasonable route when these trips are made by auto. For either of these scenarios to see changes in transit travel behavior, it is likely that development of additional transit services, such as cross-town routes, would be needed to generate a mode shift from auto to transit.

Users with Choices

As a final evaluation of the NDLSO travel markets, areas were identified that generate both auto and express bus trips to the same destination. In these cases, users traveling on NDLSO are making a decision whether to use an automobile or the express buses to reach their destination. As shown in **Figure 7**, over 30 zones were identified that had both auto and transit trip origins for the same destination. The modeled trips in these zones show very high transit utilization, with about 75% of all trips on NDLSO between these zones utilizing the express bus routes. **This level of transit utilization leaves few remaining trips available in these zones to switch from auto to transit even when NDLSO express bus performance is improved.**

This travel market analysis confirms that NDLSO is a regional facility serving a vast area of northeastern Illinois, especially for motorists. For express bus transit users, the travel markets served by NDLSO are primarily to and from areas close to the north lakefront and downtown Chicago. The model substantiates that transit is a critical travel mode in this corridor for the travel markets it serves, which validates that the proposed transit performance improvements will benefit many travelers. Nevertheless, there is limited opportunity for the proposed improvements to transit service on NDLSO to result in significant changes to overall regional travel behavior.

Figure 1 | CTA Express Bus Trips using NDLSD

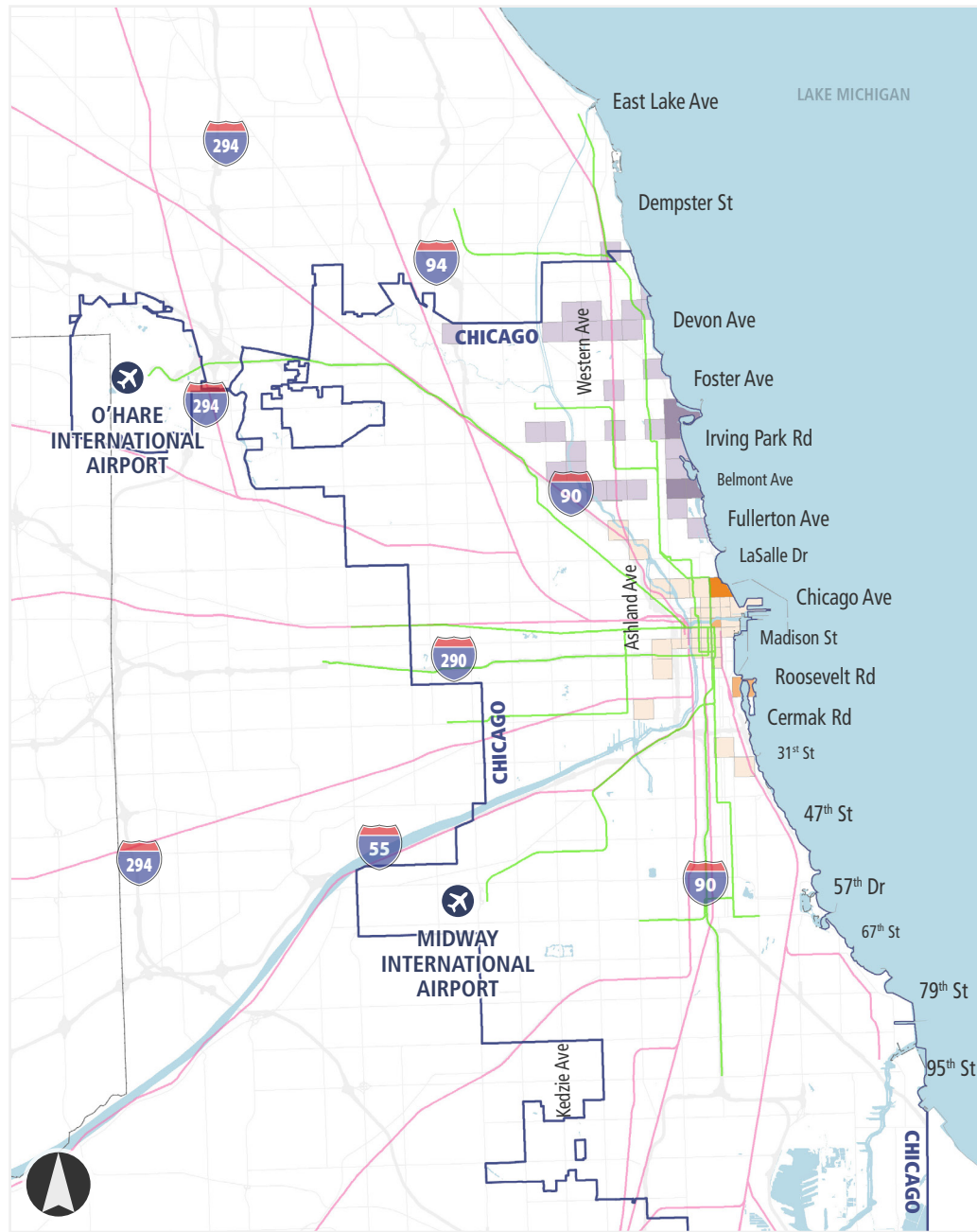


Figure 2 | CTA Red Line Trips

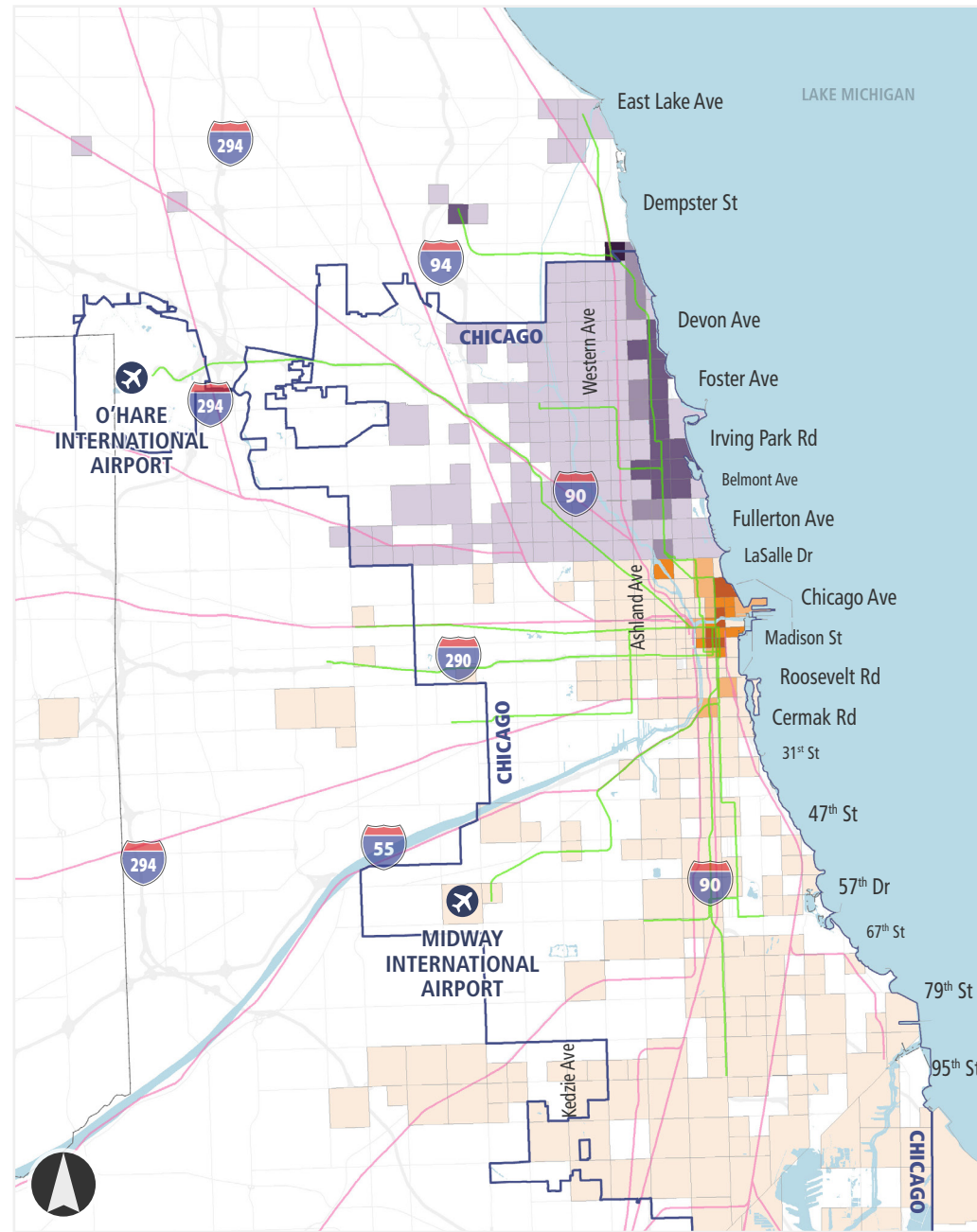
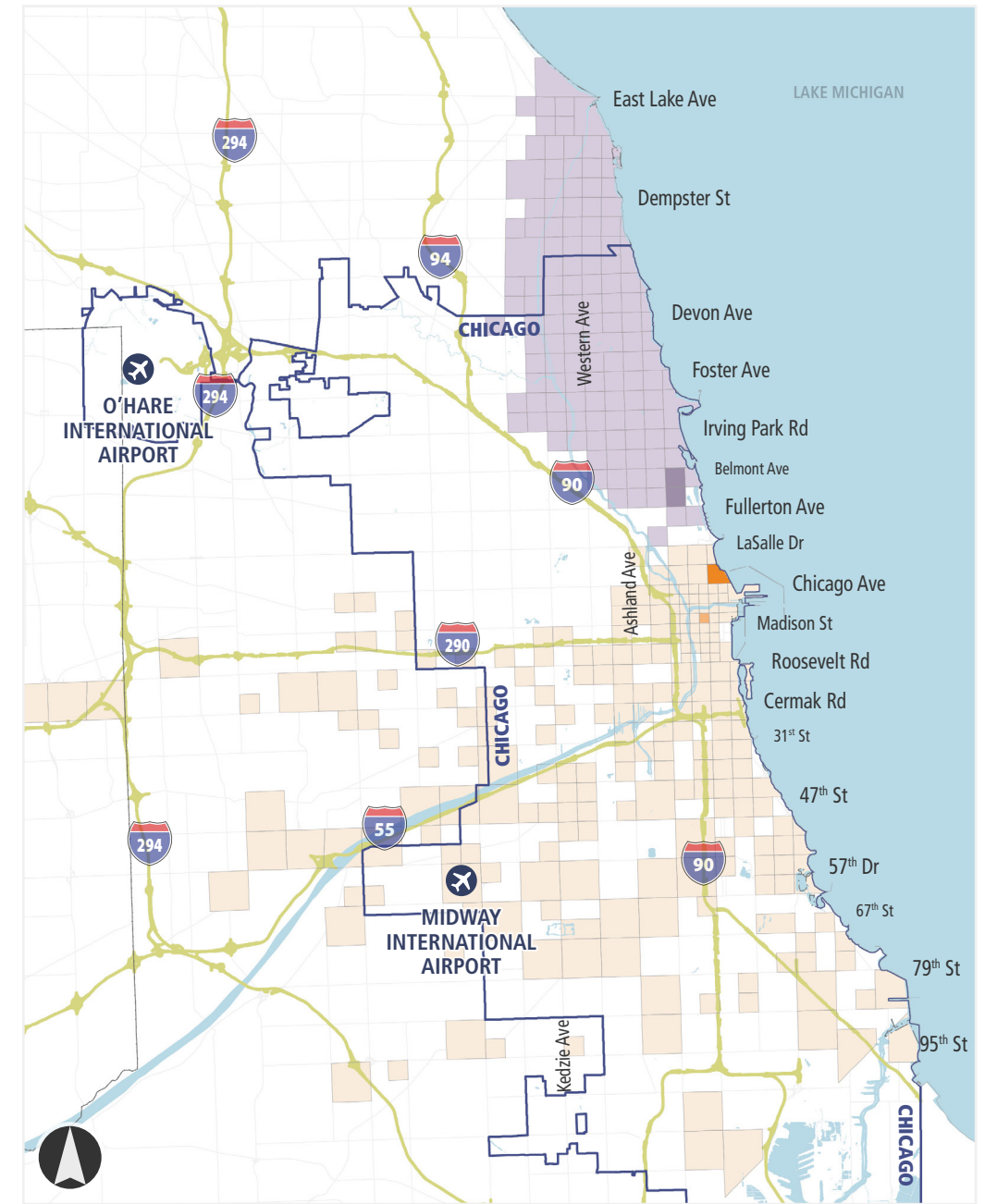


Figure 3 | Auto Trips using NDLSD



□ Traffic Analysis Zone*

— Highway

— Metra Rail Line

— CTA Rail Line

*Each traffic analysis zone (TAZ) represents an area of 80 acres, 160 acres, or 640 acres depending on size.

TRIP COUNTS	
ORIGIN	DESTINATION
5 to 499	5 to 499
500 to 999	500 to 999
1,000 to 2,499	1,000 to 2,499
2,500 or more	2,500 or more

Max Trips: Origin = 910 & Destination = 2,286

□ Traffic Analysis Zone*

— Highway

— Metra Rail Line

— CTA Rail Line

*Each traffic analysis zone (TAZ) represents an area of 80 acres, 160 acres, or 640 acres depending on size.

TRIP COUNTS	
ORIGIN	DESTINATION
5 to 499	5 to 499
500 to 999	500 to 999
1,000 to 2,499	1,000 to 2,499
2,500 or more	2,500 or more

Max Trips: Origin = 3,253 & Destination = 7,080

□ Traffic Analysis Zone*

— Highway

*Each traffic analysis zone (TAZ) represents an area of 80 acres, 160 acres, or 640 acres depending on size.

TRIP COUNTS	
ORIGIN	DESTINATION
5 to 499	5 to 499
500 to 999	500 to 999
1,000 to 2,499	1,000 to 2,499
2,500 or more	2,500 or more

Max Trips: Origin = 614 & Destination = 1,229

Figure 4 | Zones with NDLS Express Bus Transit Trip Origins Only (No Red Line Transit Trip Origins)

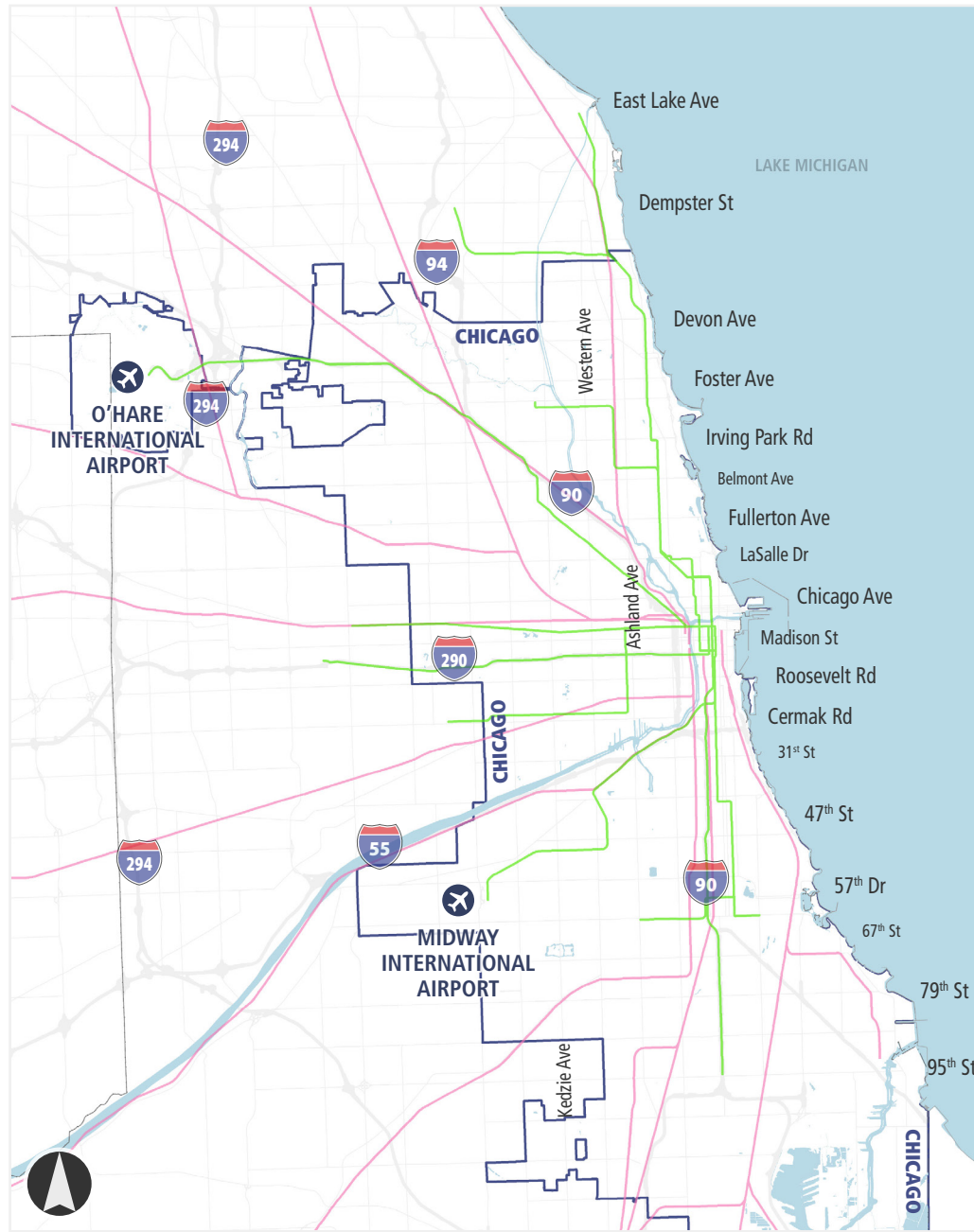


Figure 5 | Zones with Auto Only Origins (No Transit Origins) to Any Destination

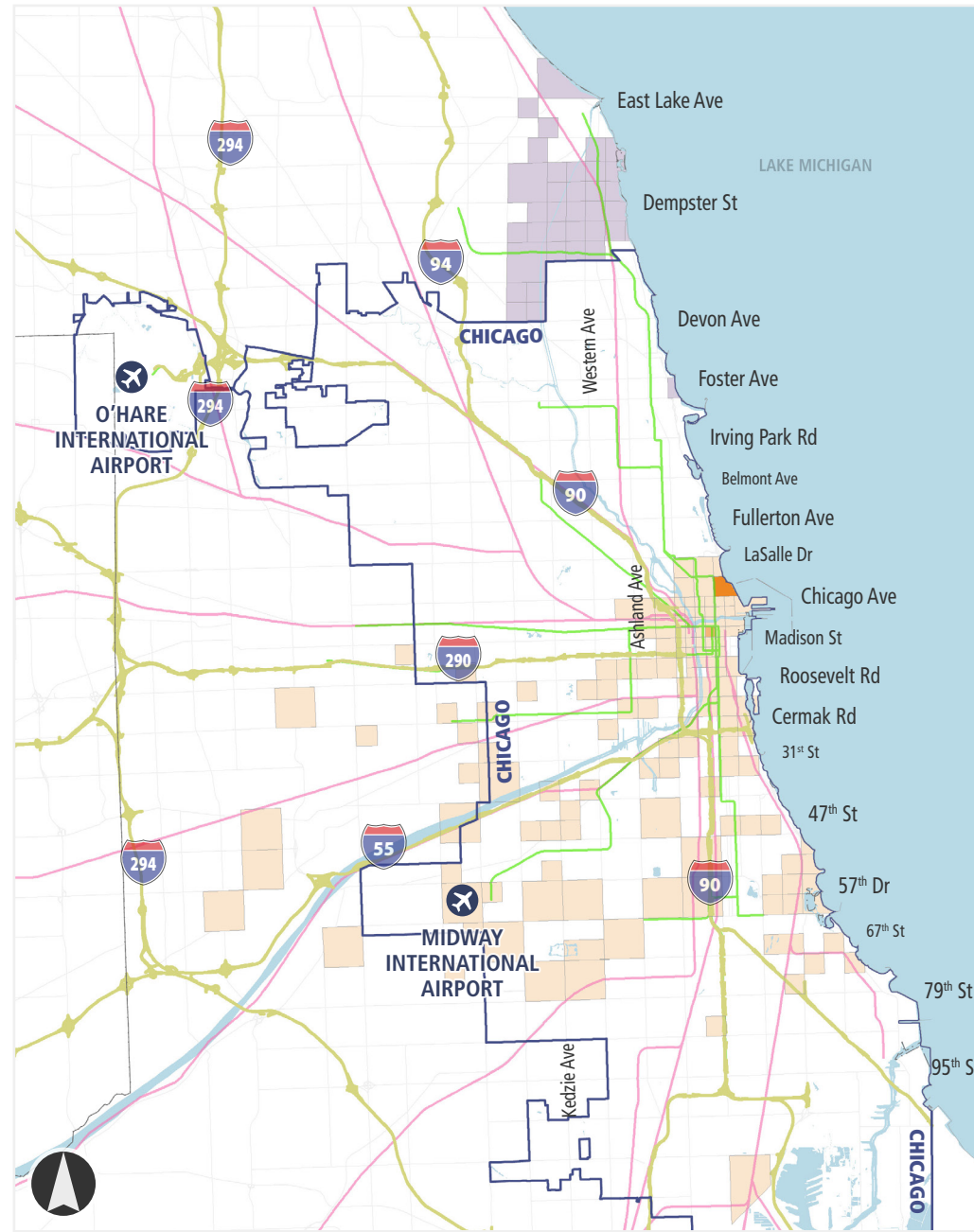
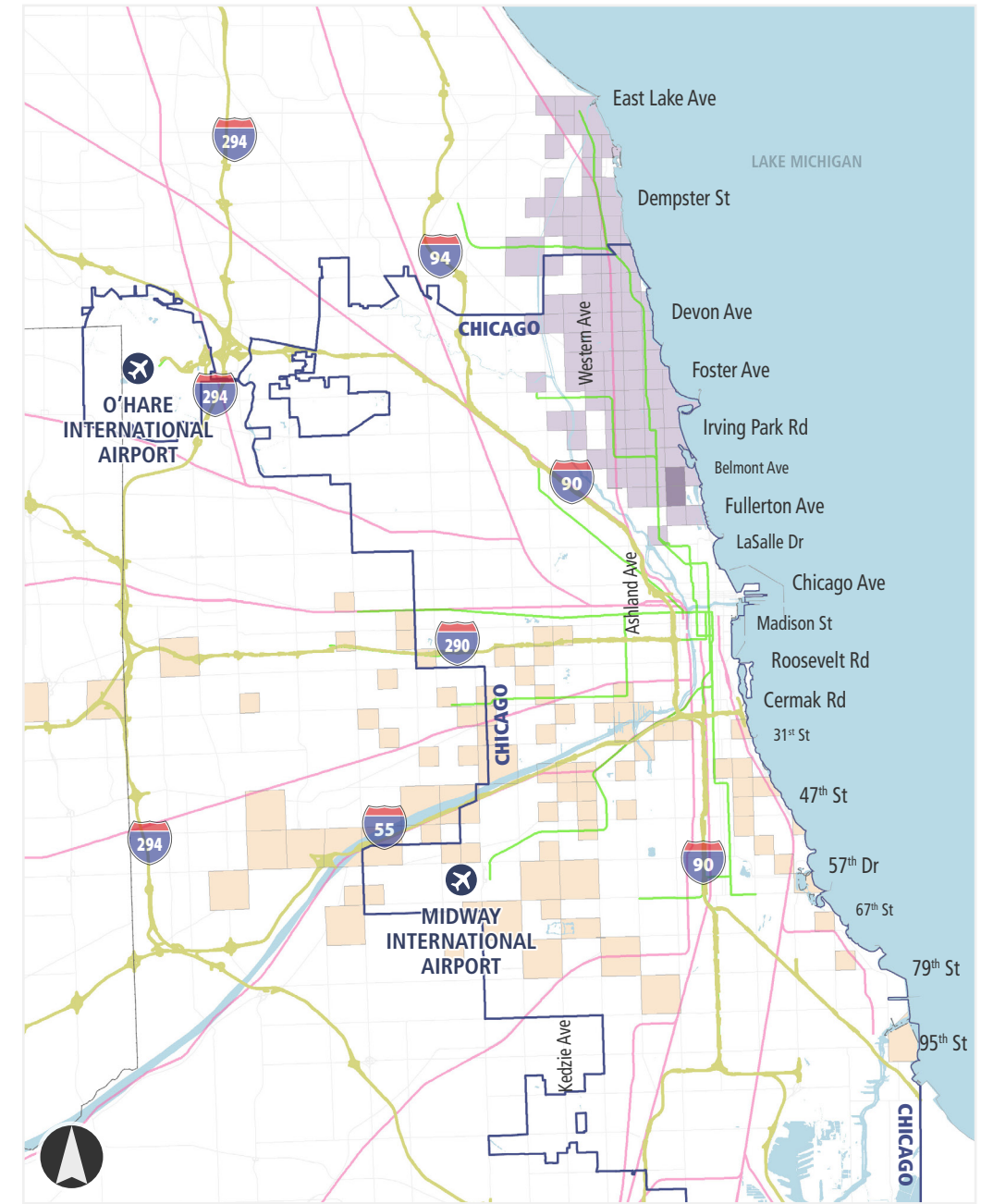


Figure 6 | Zones with Auto Only Destinations (No Transit Destinations) from Any Origin



- Traffic Analysis Zone*
- Highway
- Metra Rail Line
- CTA Rail Line

TRIP COUNTS

- | | |
|--|--|
| ORIGIN | DESTINATION |
| | |
| | |
| | |
| | |
| | |

- 5 to 499
- 500 to 999
- 1,000 to 2,499
- 2,500 or more

*Each traffic analysis zone (TAZ) represents an area of 80 acres, 160 acres, or 640 acres depending on size.

Max Trips: Origin = N/A & Destination = N/A

- Traffic Analysis Zone*
- Highway
- Metra Rail Line
- CTA Rail Line

TRIP COUNTS

- | | |
|--|--|
| ORIGIN | DESTINATION |
| | |
| | |
| | |
| | |
| | |

- 5 to 499
- 500 to 999
- 1,000 to 2,499
- 2,500 or more

*Each traffic analysis zone (TAZ) represents an area of 80 acres, 160 acres, or 640 acres depending on size.

Max Trips: Origin = 112 & Destination = 1,229

- Traffic Analysis Zone*
- Highway
- Metra Rail Line
- CTA Rail Line

TRIP COUNTS

- | | |
|--|--|
| ORIGIN | DESTINATION |
| | |
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| | |

- 5 to 499
- 500 to 999
- 1,000 to 2,499
- 2,500 or more

*Each traffic analysis zone (TAZ) represents an area of 80 acres, 160 acres, or 640 acres depending on size.

Max Trips: Origin = 614 & Destination = 58

No Action Scenario | Weekday A.M. Peak Period | Southbound Travel Direction

Figure 7 | Trips from and to Zones with both Auto & NDLSD Express Bus Origins and Destinations

Auto Trips

NDLSD Express Bus Trips

