# Appendix B-1: Regional Traffic Diversion Analysis

Ashland Avenue
Bus Rapid Transit Project
Environmental Assessment

# Memorandum

*Date:* *November 6, 2013*

*Subject:* *Regional Traffic Diversion Analysis*

*Prepared By: CDM Smith, Inc.*

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## Introduction

The Chicago Transit Authority (CTA), in cooperation with the Chicago Department of Transportation (CDOT), Department of Housing and Economic Development (DHED), and the Federal Transit Administration (FTA), is proposing to implement Bus Rapid Transit (BRT) features and service along Ashland Avenue in Chicago, Illinois. The limits for the Ashland Avenue BRT Project are:

- Irving Park Road on the north to 95th Street on the south (approximately 16.1 miles)

CTA currently operates local bus service within the Ashland Avenue BRT Project limits. The proposed improvements are limited in scope and would be implemented within existing roadway rights-of-way:

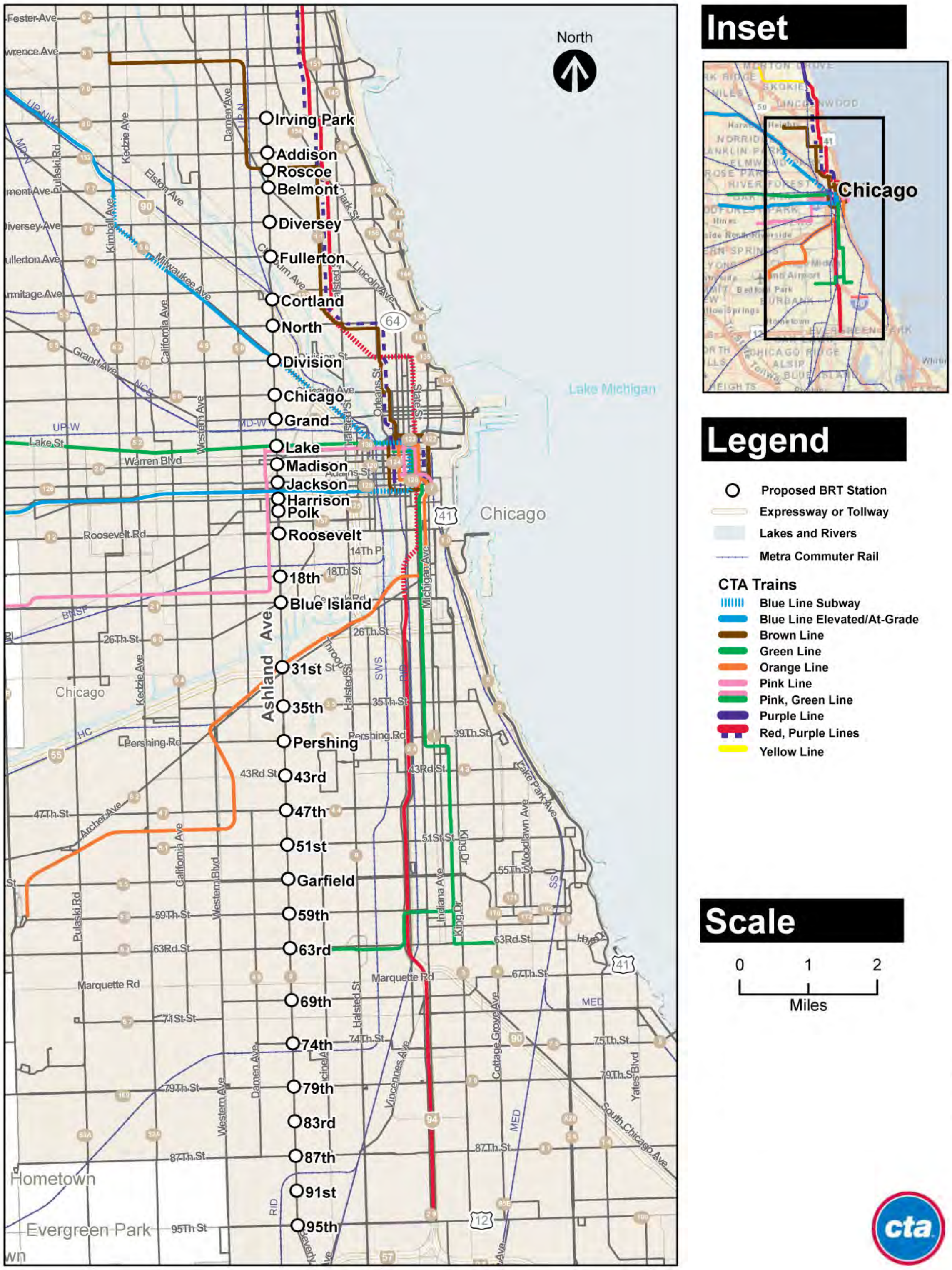
- Construction of median BRT stations with shelters and pedestrian boarding areas
- Upgrade of traffic signal systems to include transit signal priority
- Implementation of queue jumps at select locations and left-turn restrictions at most intersections
- Removal of travel lanes and left-turn lanes to accommodate a designated bus-only lane in each direction

There are 35 proposed BRT station locations, which are shown in **Figure 1.**

## Purpose

The purpose of this memorandum is to evaluate the impact of the proposed project on travel patterns within the City of Chicago as a result of removing a lane in each direction and removal of left turns. The evaluation uses a travel demand model to assess the **relative traffic shifts** resulting from the implementation of BRT as **a first of a multi-step transportation analysis process**. This evaluation includes both a general study area impact and an overall regional impact to vehicular travel.

**Figure 1: Proposed BRT Station Location Map**



Due to the model's size, complexity, and intended use to measure regional impacts, the modeled results **are not intended** to be utilized to measure intersection-specific impacts. Therefore, additional 2013 traffic counts and SYNCHRO analyses have been performed to address intersection-by-intersection impacts. Results of the entire analysis can be found in Chapter 3 of the Environmental Assessment for the Ashland Avenue BRT Project.

# Traffic Diversion Methodology Overview

Assessing the traffic impacts resulting from the conversion of one existing travel lane in each direction on Ashland Avenue to center running dedicated bus-only lanes and the removal of most left-turns along Ashland Avenue is a key factor in advancing the BRT project. Travel demand models are a standard transportation planning tool utilized in the analysis of transportation impacts of new projects. Through the use of a travel demand model, it is possible to compare modeled existing conditions and projected future travel demands.

The Chicago Metropolitan Agency for Planning (CMAP) developed and maintains the Chicago region's travel demand model. It is used for major transportation planning projects throughout the Chicago metropolitan area and, appropriately, was utilized for the analysis of the potential traffic impacts of the Ashland Avenue BRT Project.

Two primary outputs of the travel demand model that are used in evaluating travel demand between existing conditions and proposed conditions are vehicle miles traveled (VMT) and vehicle hours traveled (VHT). These measure the amount of driving taking place, cumulatively, in a given area or along a given corridor. VMT measures the total number of miles driven; VHT measures the total time spent driving.

The technical methodology used in analyzing these impacts included the following steps:

1. Utilize the CMAP travel demand model to compare regional daily (24-hour) changes in VMT and VHT between existing conditions and proposed conditions with implementation of the proposed Ashland Avenue BRT Project (Build Conditions).

2. Use the results of the CMAP regional traffic analysis (Step 1) to identify a reasonable study area boundary for further analysis and estimate the magnitude of change in daily (24-hour) VMT, VHT and average travel speeds on these parallel roadways within the study area. The study area boundary is based on the major parallel routes anticipated to be impacted as a result of traffic diverting from Ashland Avenue.

The primary objective of this analysis is to determine the change that would result from implementation of the proposed Ashland Avenue BRT Project. Therefore, the **relative percent changes rather than absolute values** are used in determining changes between Existing and Build conditions. These relative changes in the data between Existing and Build Conditions from the model provides a standard best practice forecast of traffic diversion expected to result from Build Conditions.

The following sections include a description of the CMAP travel demand model, study area, analysis assumptions, and analysis results.

# CMAP Travel Demand Model

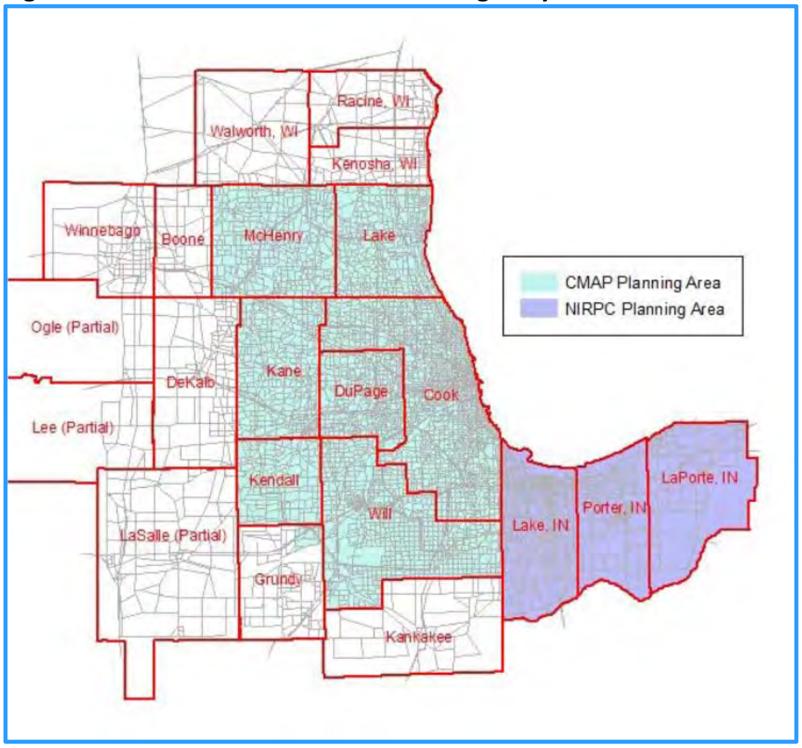
CMAP has developed and maintains its travel demand model which is used for transportation planning within the Chicago metropolitan area. In its most simplistic form, the travel demand model converts people and employees into daily trips, locates the starting and ending points for those trips and then assigns mode split between different transportation options and a path for completing these trips. While CMAP's planning region contains seven counties, CMAP's travel demand model covers a larger area encompassing the following:

- 12 full counties and three partial counties in Illinois
- three full counties in Indiana and
- three full counties in Wisconsin.

The Indiana counties comprise the metropolitan planning area for the Northwestern Indiana Regional Planning Commission (NIRPC). **Figure 2** shows the extents of CMAP highway network and the counties it covers. The CMAP travel demand model consists of the following roadway types: freeways/expressways, arterials and collectors; local roads are not included. .Given the main focus of this document, only a broad description of the CMAP travel demand model is provided. An official CMAP publication provides details of the model.[1]

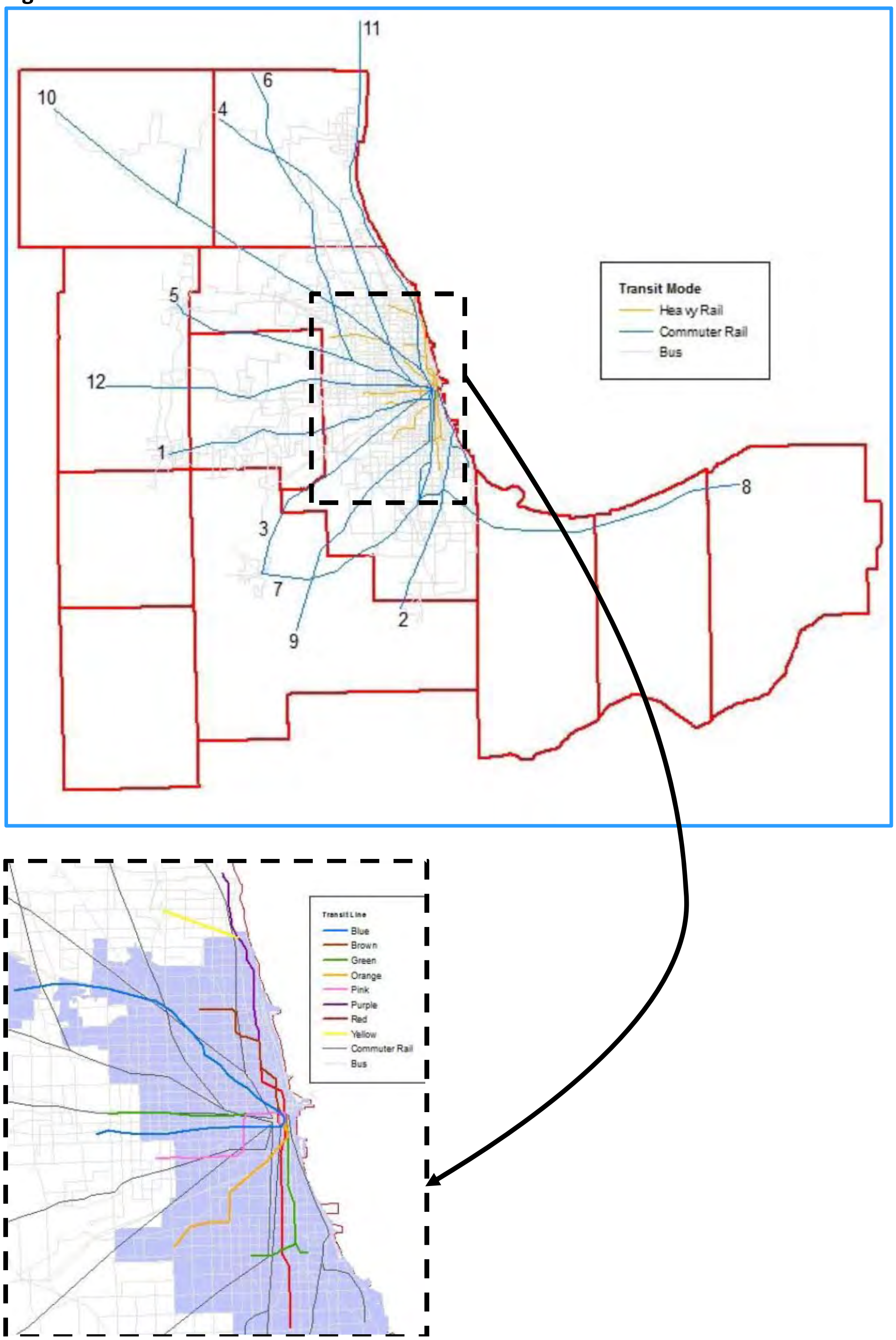
[1] CMAP (2010), Travel Demand Model Documentation Report. http://www.cmap.illinois.gov/c/document_library/get_file?uuid=cab76c8f-7d87-479f-8808-

**Figure 2: CMAP Travel Demand Model Highway Network**




In addition to the highway network, the CMAP travel demand model contains full representation of the transit system including heavy rail, commuter rail and buses. **Figure 3** provides a snapshot of the transit system used in the travel demand model.

**Figure 3: CMAP Travel Demand Model Transit Network**



CMAP's regional travel demand model is periodically validated against actual observed data and held to a federal standard on the amount the travel demand model results may deviate from observed results. The CMAP travel demand model variation (approximately 7.6%) is within the acceptable range of the federal standards for this measure. More information on validation techniques and results of the CMAP model on this topic can be found in CMAP's Travel Demand Model Validation Report[2].

## Project Study Area

*Initial*

To identify a reasonable project study area for diversion analysis, initial travel demand model results were obtained to understand changes in VMT and VHT from a regional transportation perspective. Based on initial travel demand model results, the Ashland Avenue BRT services would result in minimal changes to city-wide traffic conditions. Compared to the existing conditions, VMT would decrease by 0.01% and VHT would increase by 0.08% across the entire City of Chicago. In addition, initial results showed that the changes to traffic conditions largely occur from Kedzie Avenue in the west to Halsted Street in the east (see **Figure 8**), which are used as the project study area boundaries.

*Refined*

Given the minor city-wide changes outside of Kedzie Avenue to Halsted Street, a smaller study area surrounding the Ashland Avenue BRT service corridor was selected for more detailed traffic analysis as indicated by the black dashed line in **Figure 4**. The roadway network study area included major parallel north-south roadways to the east and west of Ashland Avenue, bounded by Irving Park Road, to the north, and 95th Street, to the south. The eastern study area boundary for the purposes of the focused analysis was Halsted Street and the western boundary was Kedzie Avenue.

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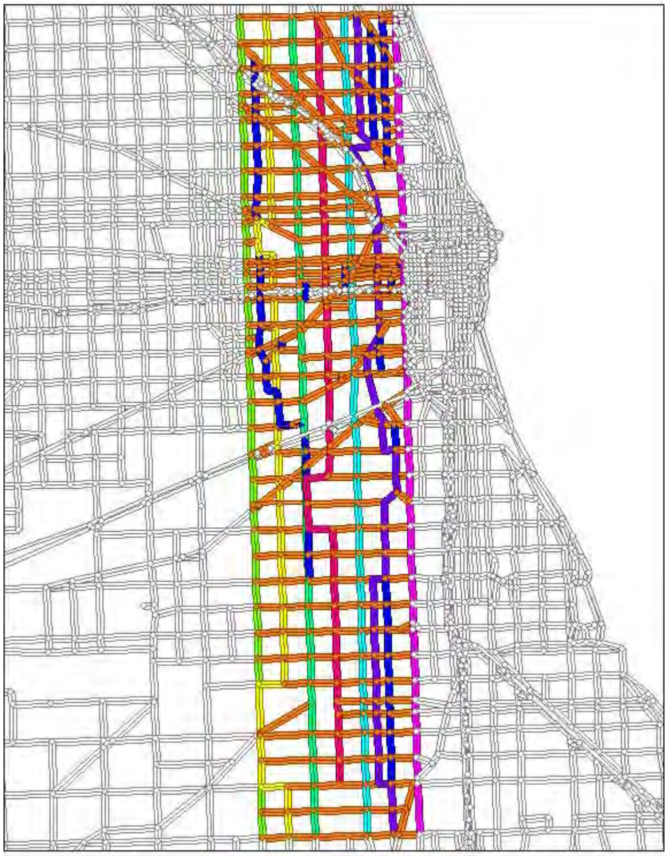
[2] CMAP (2011). Travel Demand Model Validation Report.
http://www.cmap.illinois.gov/c/document_library/get_file?uuid=c5eaeec4-f581-4126-bce1-

**Figure 4: Project Study Area**


The following parallel north-south roadways were identified for detailed tabulations as shown on **Figure 5**:

- Kedzie Avenue (Light Green)
- California Avenue (Yellow)
- Western Avenue (Dark Green)
- Damen Avenue (Red)
- Ashland Avenue (Light Blue)
- Racine/Southport Avenue and other roadways (Purple)
  - Racine and Southport Avenues provide parallel travel options for traffic, but are not continuous throughout the 16.1-mile long study area. Because they are not continuous, the model results along this north-south corridor were tabulated for parts of Racine, Southport and other routes representing the likely diversion along this parallel route. **Attachment A** includes the full list of roadways, which comprise this parallel route.
- Halsted Street (Pink)
- Other North-South roadways within the study area (Dark Blue)

**Figure 5: Study Area Roadways**



Summary data for the study area were developed as follows:

- North-South Corridor – summation of all north-south roadways highlighted in **Figure 5**
- East-West Corridor – summation of all east-west roadways bounded by Kedzie Avenue to the west and Halsted Street to the east (highlighted in orange in **Figure 5**). **Attachment A** includes a full list of these east-west roadways.
- Combined Corridor – summation of both the North-South and East-West Corridors

The transit network included all existing north-south CTA bus routes that operate on north-south roadways contained in the roadway study area. These routes included:

- #8 Halsted
- #9 Ashland
- #44 Wallace-Racine
- #48 South Damen
- #49 Western
- #49A South Western
- #50 Damen
- #52 Kedzie-California
- #52A South Kedzie
- #94 South California
- Proposed Ashland BRT (Build Conditions only)

## Model Input Assumptions

Using the travel demand model and study area described above, an initial analysis was performed. The primary objectives of this analysis were:

- To determine study area impacts of implementing BRT on the Ashland Avenue corridor
- To determine the congestion impacts on alternate routes within the study area as a result of capacity reduction on the Ashland Avenue corridor
- To identify possible impacts outside of the study area due to re-routing of traffic

**The following metrics were measured and compared between the Existing and the Build Alternative conditions**:

1. Vehicle Miles Traveled (VMT)
    - Summation of all VMT on roadway facility segments
2. Percent Congested VMT
    - Congested VMT, summation of all VMT on roadway facility segments where the volume exceeds capacity (v/c >1), compared to total VMT
3. Vehicle Hours Traveled (VHT)
    - Summation of all VHT on roadway facility segments
4. Percent Congested VHT –
    - Congested VHT, summation of all VHT on roadway facility segments where the volume exceeds capacity (v/c >1), compared to total VHT
5. Travel Speed
    - Average congested travel speed (mph) on roadway facility segments (both directions)

### Existing Conditions

The Existing conditions assumptions were based on the regional modeling inputs used for the 2010 analysis year in the air quality conformity analysis completed by CMAP in spring 2012 (C12 Q1). The roadway network represented the existing segment geometrics and capacity, left- and right-turn restrictions, and traffic signal timings. The transit network represented the existing bus route stop locations, headways, service span, and running speeds.

### Build Conditions

The Build Conditions assumptions include the following based on maximum operational characteristics of the Ashland Avenue BRT Project:

- Left-Turn Restrictions – left-turns were restricted at all the intersections along Ashland Avenue between Irving Park Road, to the north, and 95th Street, to the south.
- Travel Lane Removal – one travel lane in each direction was removed along Ashland Avenue between Irving Park Road, to the north, and 95th Street, to the south.
- BRT Service Characteristics – proposed Ashland BRT included 24-hour service span, 5 minute headways, 15.9 miles per hour (mph) average running speed, and 35 proposed stop locations; local bus service remained in place.

## Analysis Results

### Existing Conditions

The daily existing conditions results are shown in **Tables 1 and 2**. Daily vehicle flows are shown on **Figure 6**. Along Ashland Avenue, 17% and 21% of all VMT and VHT, respectively, occurs under congested conditions, resulting in an average travel speed of 18.3 mph. Ashland Avenue experiences lower levels of congested VMT and VHT and faster travel speed than the North-South Corridor.

**Table 1: Existing Conditions Results by North-South Routes**

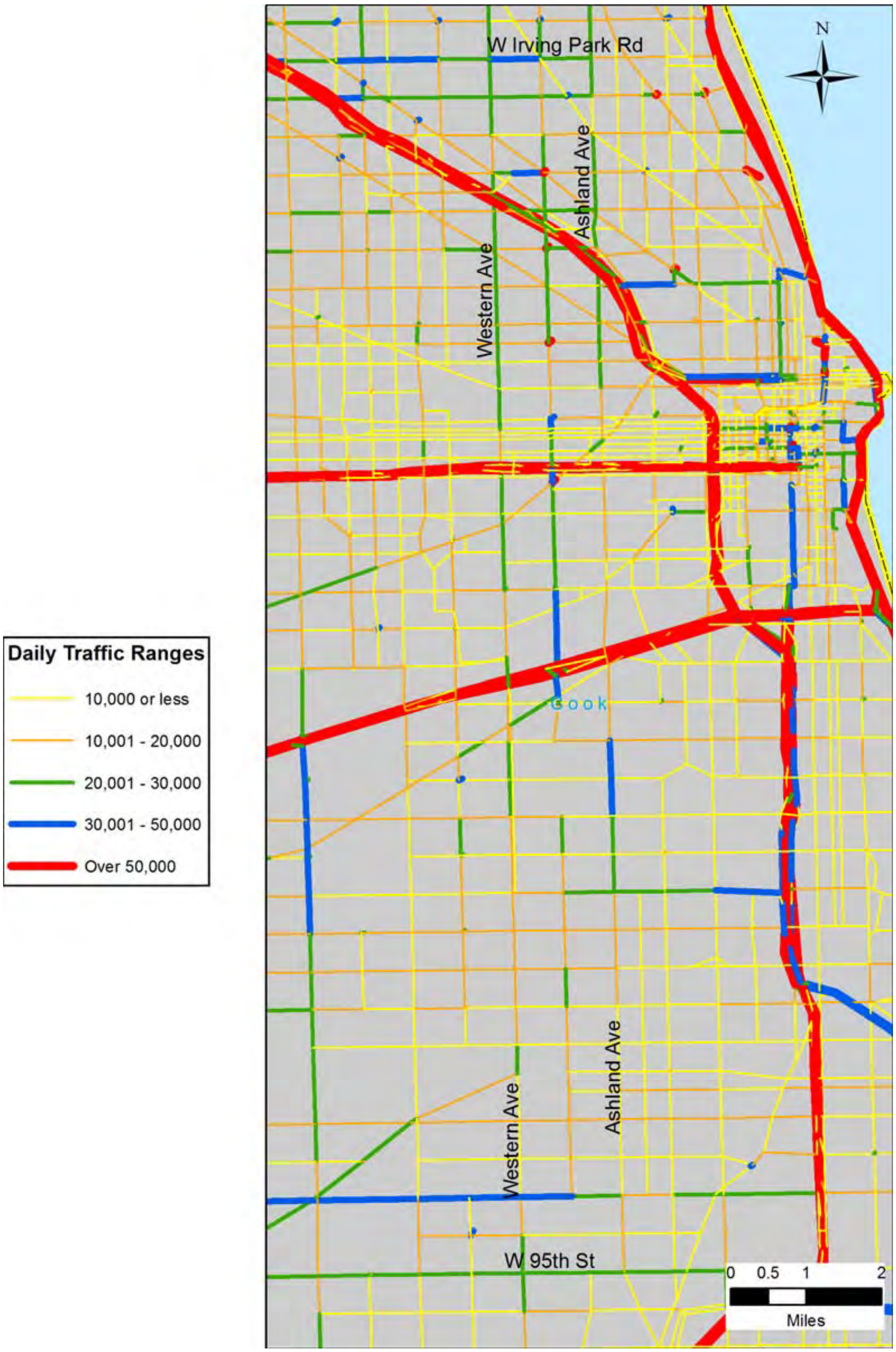
| | Kedzie Ave. | California Ave. | Western Ave. | Damen Ave. | Ashland Ave. | Racine Ave./ Southport Ave. (and other routes) | Halsted St. | Other North-South Roadways |
|---|---|---|---|---|---|---|---|---|
| **VMT** | 89,928 | 178,394 | 306,429 | 322,336 | 264,626 | 104,853 | 121,022 | 170,158 |
| **% Congested VMT** | 12% | 18% | 15% | 44% | 17% | 15% | 21% | 8% |
| **VHT** | 5,064 | 10,164 | 16,658 | 17,606 | 13,643 | 6,136 | 6,695 | 10,081 |
| **% Congested VHT** | 18% | 28% | 18% | 51% | 21% | 22% | 28% | 14% |
| **Travel Speed** | 20.6 | 15.5 | 18.1 | 17.3 | 18.3 | 17.9 | 17.4 | 17.0 |

**Table 2: Existing Conditions Results by Corridor**

| | North-South Corridor | East-West Corridor | Study Area |
|---|---|---|---|
| **VMT** | 1,557,746 | 1,484,645 | 3,042,391 |
| **% Congested VMT** | 21% | 21% | 21% |
| **VHT** | 86,047 | 83,025 | 169,072 |
| **% Congested VHT** | 27% | 27% | 27% |
| **Travel Speed** | 17.6 | n/a | n/a |

In reviewing the existing conditions travel demand model outputs, the VMT for Damen Avenue appears to be higher than expected when compared with other parallel routes in the study area. However, the modeled VMT value is not used in the analysis, rather the relative change between Existing and Build Conditions is used, which is the best indicator for regional traffic diversion.

**Figure 6: Existing Conditions Daily Flow**



## Build Conditions

The daily Build Alternative conditions results are shown in **Tables 3 and 4**. Daily vehicle flows are shown on **Figure 7**. Along Ashland Avenue, 27% and 34% of all VMT and VHT, respectively, would occur under congested conditions, resulting in an average travel speed of 16.7 mph. Ashland Avenue would experience higher levels of congested VMT and VHT and slower travel speed than the North-South Corridor due to the travel lane removals.

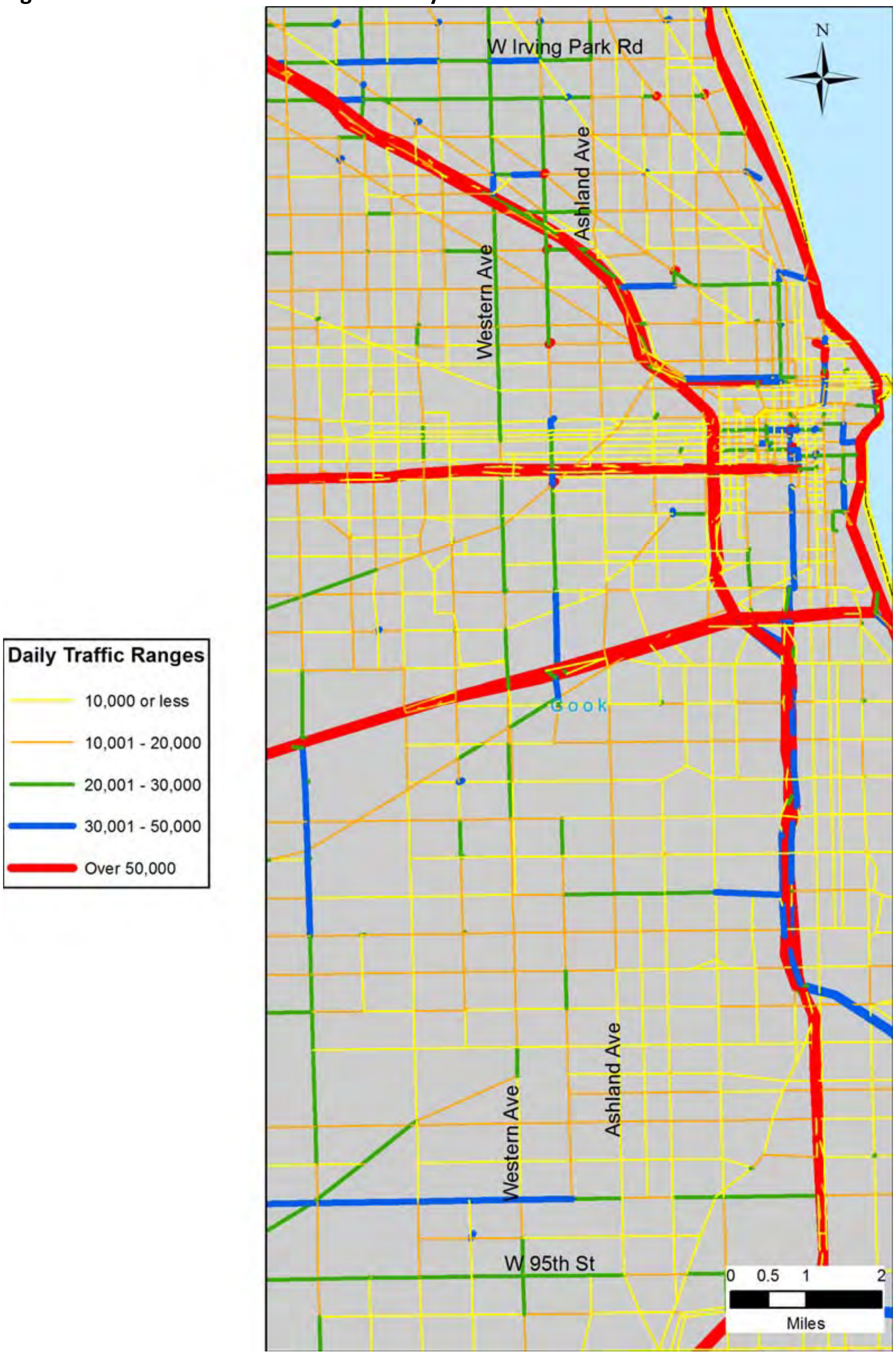
**Table 3: Build Alternative Conditions Results by North-South Routes**

| | Kedzie Ave. | California Ave. | Western Ave. | Damen Ave. | Ashland Ave. | Racine Ave/ Southport Ave. (and other routes) | Halsted St. | Other North-South Roadways |
|---|---|---|---|---|---|---|---|---|
| **VMT** | 92,252 | 181,079 | 324,322 | 330,349 | 172,335 | 117,424 | 126,290 | 179,267 |
| **% Congested VMT** | 12% | 19% | 18% | 45% | 27% | 17% | 21% | 9% |
| **VHT** | 5,228 | 10,365 | 17,875 | 18,454 | 9,061 | 6,896 | 7,029 | 10,671 |
| **% Congested VHT** | 18% | 30% | 22% | 53% | 34% | 24% | 28% | 15% |
| **Travel Speed** | 20.4 | 15.4 | 17.8 | 16.8 | 16.7 | 17.4 | 17.2 | 16.8 |

**Table 4: Build Alternative Conditions Results by Corridor**

| | North-South Corridor | East-West Corridor | Study Area |
|---|---|---|---|
| **VMT** | 1,523,319 | 1,486,407 | 3,009,726 |
| **% Congested VMT** | 24% | 21% | 22% |
| **VHT** | 85,579 | 83,301 | 168,880 |
| **% Congested VHT** | 30% | 27% | 29% |
| **Travel Speed** | 17.1 | n/a | n/a |

**Figure 7: Build Alternative Conditions Daily Flow**



## Comparison of Existing and Build Alternative Conditions Results

The comparison of Existing and Build Alternative conditions results are shown in **Tables 5 and 6**. As shown on **Figure 8**, the Build Alternative conditions will result in a traffic shift from Ashland Avenue to other facilities in the surrounding roadway network. However, the results of the analysis indicate that the robust Chicago grid network is sufficient to absorb the traffic shifts across multiple parallel facilities, resulting in minor VMT increases (two percent to 12 percent) along any single roadway within the Study Area. The grid network provides many different traffic routing options for drivers between origins and destinations within the city. Individual driving patterns would change to adapt to the Build Alternative conditions along Ashland Avenue and traffic would naturally redistribute to parallel roadways.

**Table 5: Comparison of Existing and Build Alternative Conditions Results by North-South Routes**

| | Kedzie Ave. | California Ave. | Western Ave. | Damen Ave. | Ashland Ave. | Racine Ave./ Southport Ave. (and other routes) | Halsted St. | Other North-South Roadways |
|---|---|---|---|---|---|---|---|---|
| **VMT** | 3% | 2% | 6% | 2% | -35% | 12% | 4% | 5% |
| **Congested VMT** | 4% | 8% | 29% | 4% | 7% | 25% | 4% | 16% |
| **VHT** | 3% | 2% | 7% | 5% | -34% | 12% | 5% | 6% |
| **Congested VHT** | 5% | 6% | 30% | 8% | 7% | 24% | 6% | 13% |
| **Travel Speed** | 1% | 1% | 2% | 3% | 10% | 3% | 1% | -1% |

Along Ashland Avenue, the Build Alternative conditions would decrease VMT by 35% and increase congested VMT by 7%. Similarly, VHT would decrease by 34% and congested VHT would increase by 7%, resulting in a 10% decrease in travel speed.

VMT and VHT are metrics that describe the length and time of travel along a given roadway. These metrics will change as travel patterns within the study area change. Therefore, the total within the study area would not be equal in Existing and Build conditions. Specifically any decrease in VMT or VHT along Ashland Avenue would not result in an equal increase in VMT or VHT on parallel roadways within the study area. Changes to these metrics are based on, but not limited to, a combination of the following:

- Vehicle traffic shifts to other roadways
- Changes to existing commuting patterns (single occupant vehicle to carpool, vehicle to transit, etc.)
- Changes in the transportation system (introduction of additional travel modes, reduction of vehicle travel lanes, etc.)
- Changes in the origins and destination of trips within the study area based on the changes to the transportation system
- Changes in the number of daily trips
- Changes in the length of daily trips

**Figure 8: Comparison of Existing and Build Alternative Conditions Daily Flow**

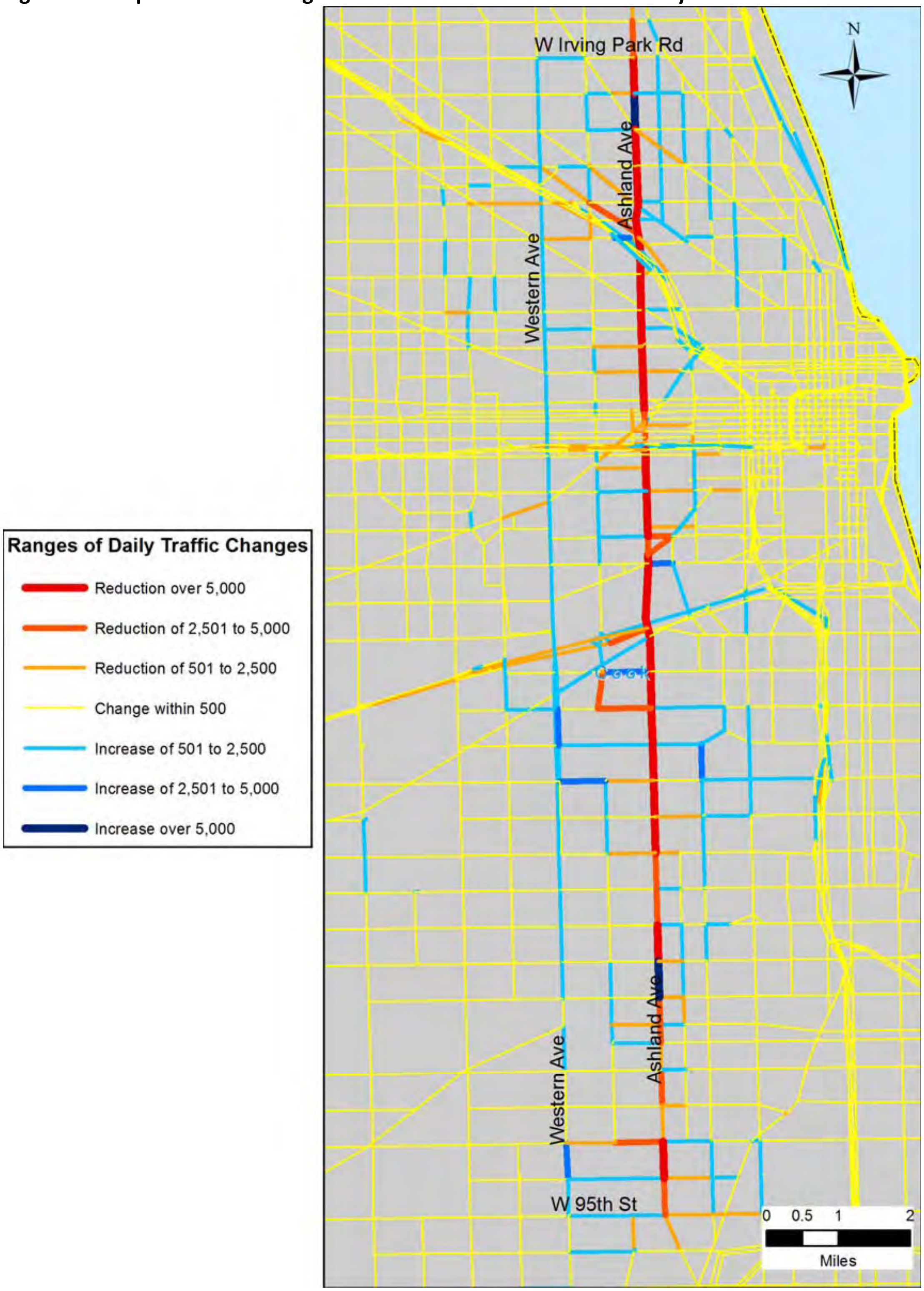


**Table 6: Comparison of Existing and Build Alternative Conditions Results by Corridors**

| | North-South Corridor | East-West Corridor | Study Area |
|---|---|---|---|
| **VMT** | -2% | 0% | -1% |
| **Congested VMT** | 10% | 0% | 5% |
| **VHT** | -1% | 0% | 0% |
| **Congested VHT** | 11% | 1% | 6% |
| **Travel Speed** | -3% | n/a | n/a |

Along the North-South Corridor, the Build Alternative conditions would decrease VMT by 2% and increase congested VMT by 10%. Similarly, VHT would decrease by 1% and congested VHT would increase by 11%, resulting in a 3% decrease in travel speed.

Along the East-West Corridor, the Build Alternative conditions would not change VMT nor congested VMT. Similarly, VHT would not change and congested VHT would increase by 1%. Within the Study Area, the Build Alternative conditions would decrease VMT by 1% and increase congested VMT by 5%. Similarly, VHT would not change and congested VHT would increase by 6%.

## Attachment A

A complete list of the roadways tabulated for the Racine Avenue/Southport Avenue corridor, shown in Purple in Figure 5 of the memo, is as follows (from north to south):

- Southport Avenue (Irving Park Road to Clybourn Avenue)
- Clybourn Avenue (Southport Avenue to Cortland Street)
- Cortland Street (Clybourn Avenue to Elston Avenue)
- Elston Avenue (Cortland Street to Milwaukee Avenue)
- Milwaukee Avenue (Elston Avenue to Ogden Avenue)
- Ogden Avenue (Milwaukee Avenue to Racine Avenue)
- Racine Avenue (Ogden Avenue to Blue Island Avenue)
- Blue Island Avenue (Racine Avenue to Loomis Street)
- Loomis Street (Blue Island Avenue to 31st Street)
- 31st Street (Loomis Street to Racine Avenue)
- Racine Avenue (31st Street to 35th Street)
- 35th Street (Racine Avenue to Morgan Street)
- Morgan Street (35th Street to 43rd Street)
- 43rd Street (Morgan Street to Racine Avenue)
- Racine Avenue (43rd Street to Garfield Boulevard)
- Garfield Boulevard (Racine Avenue to Loomis Boulevard)
- Loomis Boulevard (Garfield Boulevard to 87th Street)
- 87th Street (Loomis Boulevard to Racine Avenue)
- Racine Avenue (87th Street to 95th Street)

The other North-South roadways within the study area shown in Dark Blue in Figure 5 of the memo include:

- Humboldt Boulevard (Milwaukee Avenue to Grand Avenue)
- Sacramento Boulevard (Fulton Street to Marshall Boulevard)
- Marshall Boulevard (Sacramento Boulevard to California Boulevard)
- California Boulevard (Marshall Boulevard to 31st Boulevard)
- 31st Boulevard (California Boulevard to Western Boulevard)
- Western Boulevard (31st Boulevard to Garfield Boulevard)
- Washtenaw Avenue (Ogden Avenue to 16th Street)
- Oakley Boulevard (Adams Street to Harrison Street)
- Paulina Street (Washington Boulevard to Congress Parkway)
- Morgan Street (Adams Street to Harrison Street)
- Sangamon Street (Monroe Street to Madison Street)
- Green Street (Washington Boulevard to Randolph Street)
- Throop Street (Washington Boulevard to 95th Street)
- Racine Avenue (Clark Street to Clybourn Avenue)
- Sheffield Avenue (Irving Park Road to North Avenue)

- Racine Avenue (Blue Island Avenue to Cermak Road)
- Morgan Street (31st Street to 35th Street)
- Racine Avenue (Garfield Avenue to 87th Street)

The east-west roadways bounded by Kedzie Avenue, to the west, and Halsted Street, to the east, shown in orange in Figure 5 of the memo, include the following within the study area:

- Irving Park Road
- Addison Street
- Belmont Avenue
- Diversey Avenue
- Logan Boulevard (Kedzie Avenue to Diversey Avenue)
- Fullerton Avenue
- Webster Avenue (Damen Avenue to Clybourn Avenue)
- Armitage Avenue
- North Avenue
- Division Street
- Augusta Boulevard (Kedzie Avenue to Kennedy Expressway)
- Chicago Avenue
- Grand Avenue
- Lake Street
- Washington Boulevard
- Randolph Street
- Warren Boulevard
- Madison Street
- Monroe Street (Ashland Avenue to Halsted Street)
- Adams Street (Western Avenue to Halsted Street)
- Jackson Boulevard
- Van Buren Street (Western Avenue to Halsted Street)
- Congress Parkway (Western Avenue to Racine Avenue)
- Harrison Street
- Polk Street (Damen Avenue to Ashland Avenue)
- Taylor Street (Racine Avenue to Halsted Street)
- 16th Street (Kedzie Avenue to Western Avenue)
- 16th Street (Ashland Avenue to Halsted Street)
- 18th Street (Western Avenue to Halsted Street)
- Cermak Road
- 26th Street (Kedzie Avenue to Western Avenue)
- 31st Street
- 35th Street (California Avenue to Halsted Street)
- Pershing Road

- 43rd Street
- 47th Street
- 51st Street
- Garfield Boulevard
- 59th Street
- 63rd Street
- Marquette Road
- 71st Street
- 74th Street (Damen Avenue to Halsted Street)
- 76th Street (Damen Avenue to Halsted Street)
- 79th Street
- 83rd Street
- 87th Street
- 91st Street
- 95th Street

All diagonal routes in the study area, which the model considers east-west routes and are shown in orange in Figure 5 of the memo include:

- Clark Street
- Lincoln Avenue
- Clybourn Avenue
- Elston Avenue
- Milwaukee Avenue
- Ogden Avenue
- Blue Island Avenue
- Archer Avenue
- 63rd Street Parkway
- Columbus Avenue
- Vincennes Avenue

# Ashland BRT Off-Corridor Analysis--Diverted Volumes Existing to Build Alternative (AM Peak)

**Legend**

XX Total Volume Increase during Peak Period

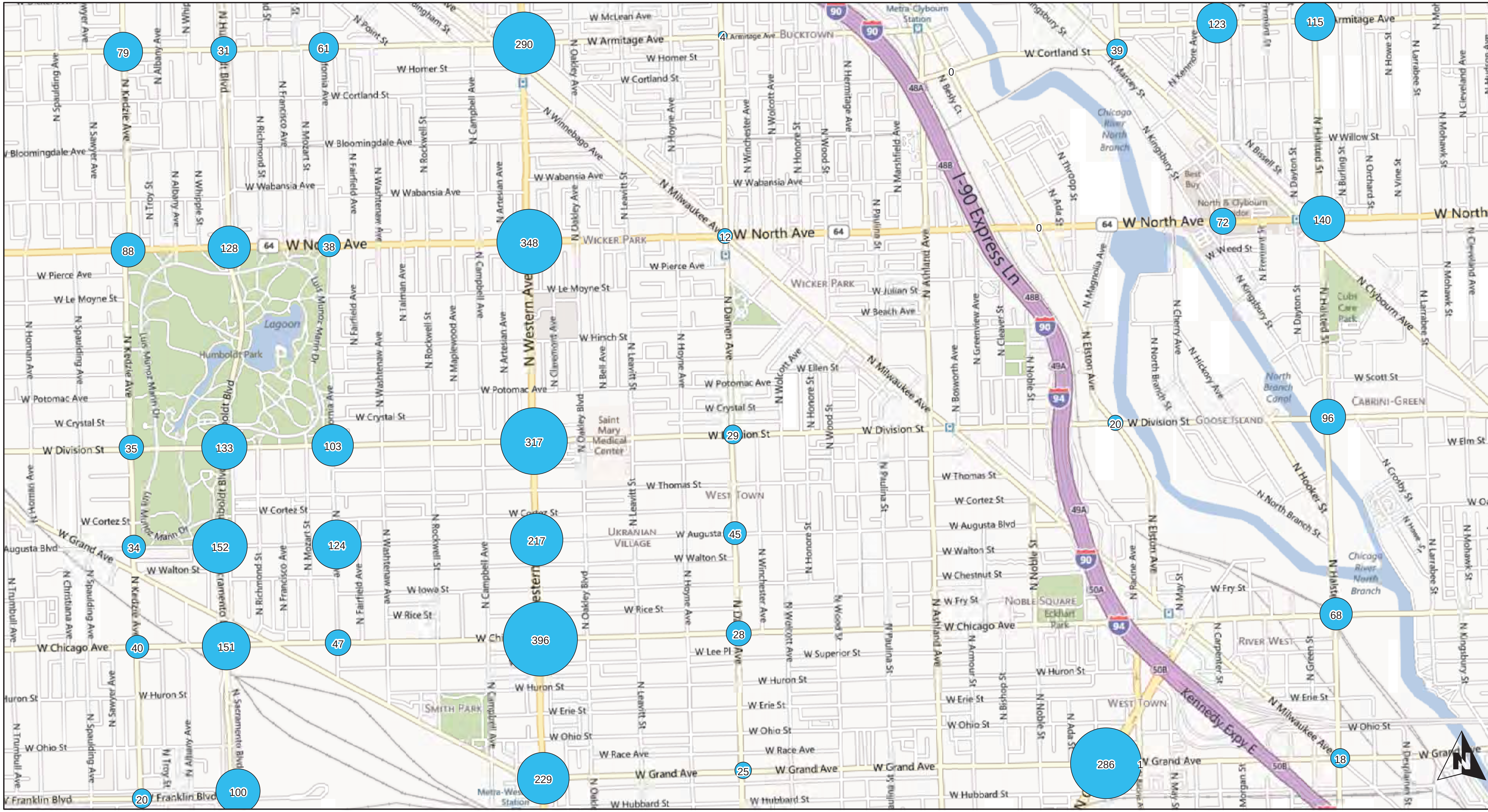
**Screenline Percent**

5%

10%

25%

50%




0 0.125 0.25 0.5 Miles

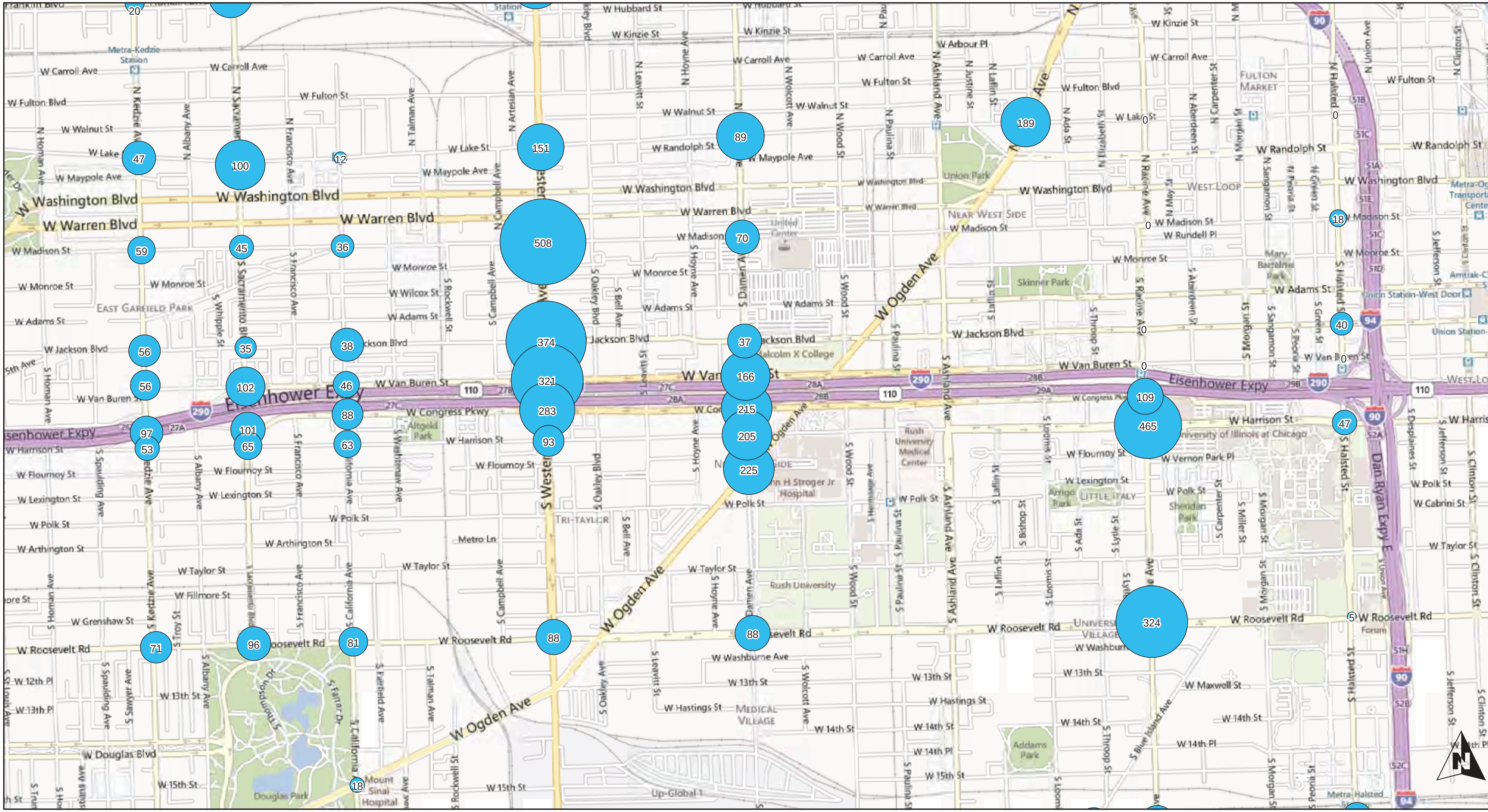
# Ashland BRT Off-Corridor Analysis--Diverted Volumes Existing to Build Alternative (AM Peak)

**Legend**

XX Total Volume Increase during Peak Period

**Screenline Percent**

5%
10%
25%
50%




0 0.125 0.25 0.5 Miles

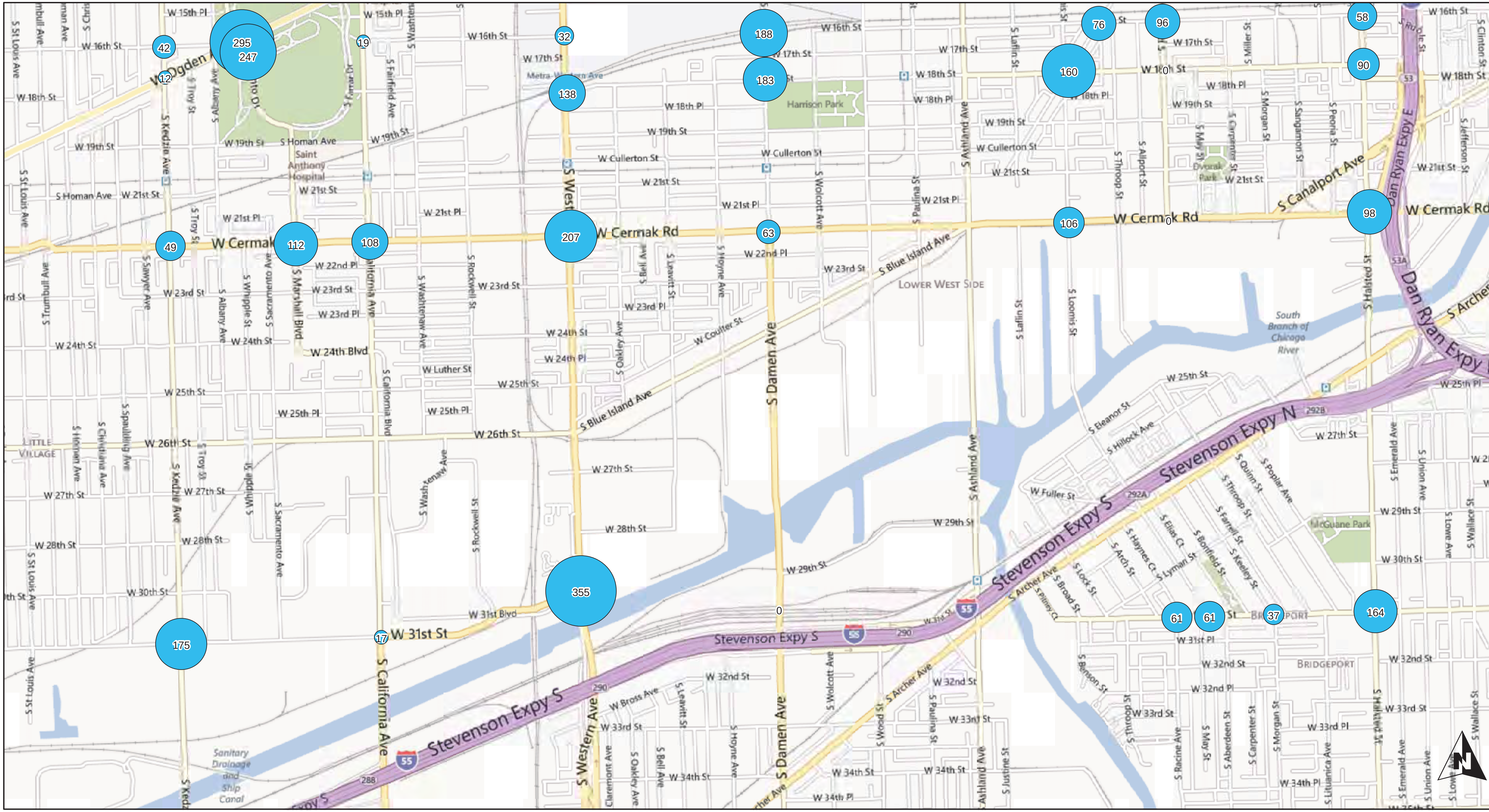
# Ashland BRT Off-Corridor Analysis--Diverted Volumes
# Existing to Build Alternative (AM Peak)

**Legend**

(XX) Total Volume Increase during Peak Period

**Screenline Percent**

5%
10%
25%
50%




0 0.125 0.25 0.5 Miles

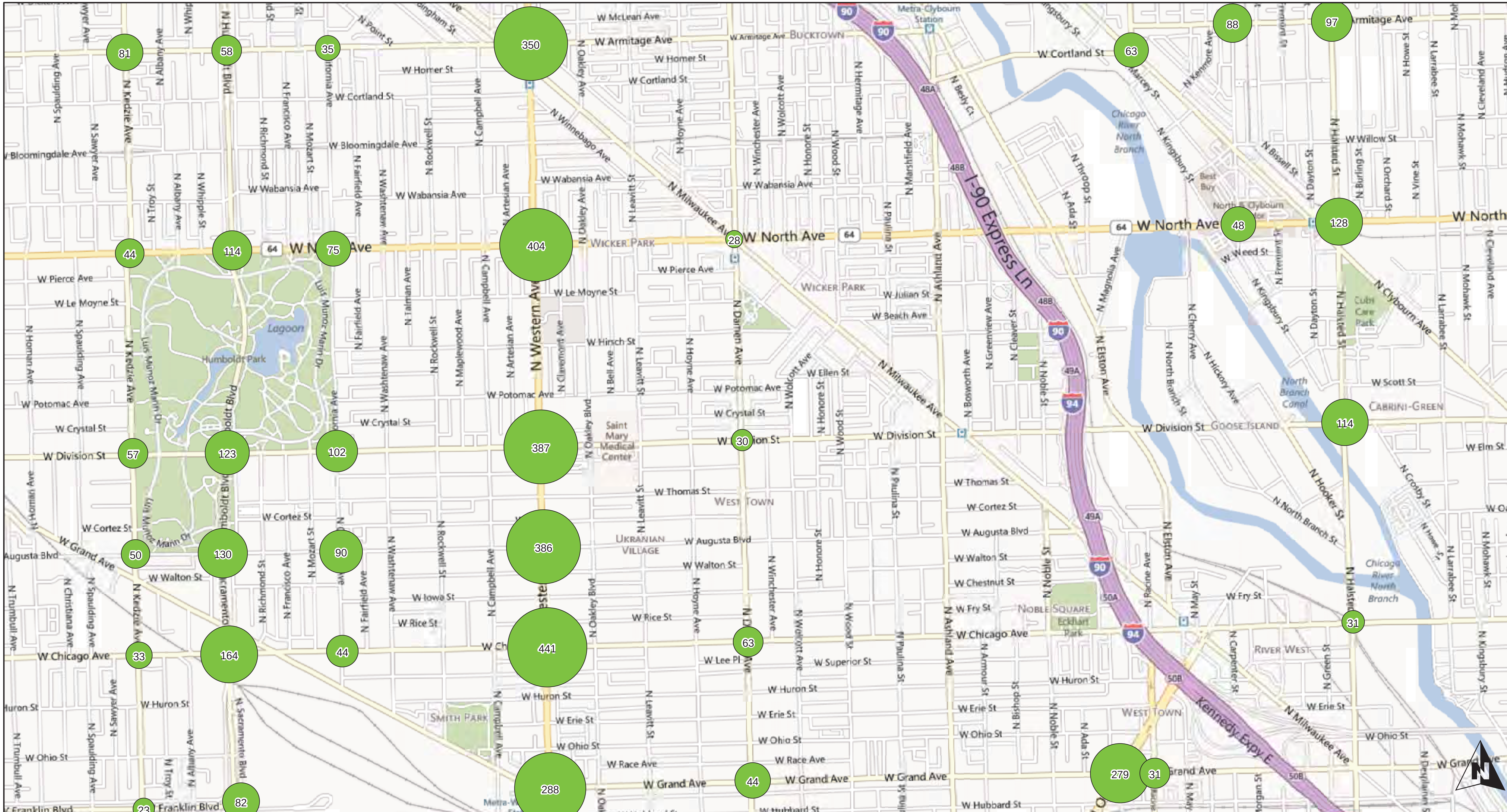
# Ashland BRT Off-Corridor Analysis--Diverted Volumes
# Existing to Build Alternative (PM Peak)

**Legend**

XX Total Volume Increase during Peak Period

**Screenline Percent**

5%
10%
25%
50%




0 0.125 0.25 0.5 Miles

# Ashland BRT Off-Corridor Analysis--Diverted Volumes
# Existing to Build Alternative (PM Peak)

**Legend**

XX Total Volume Increase during Peak Period

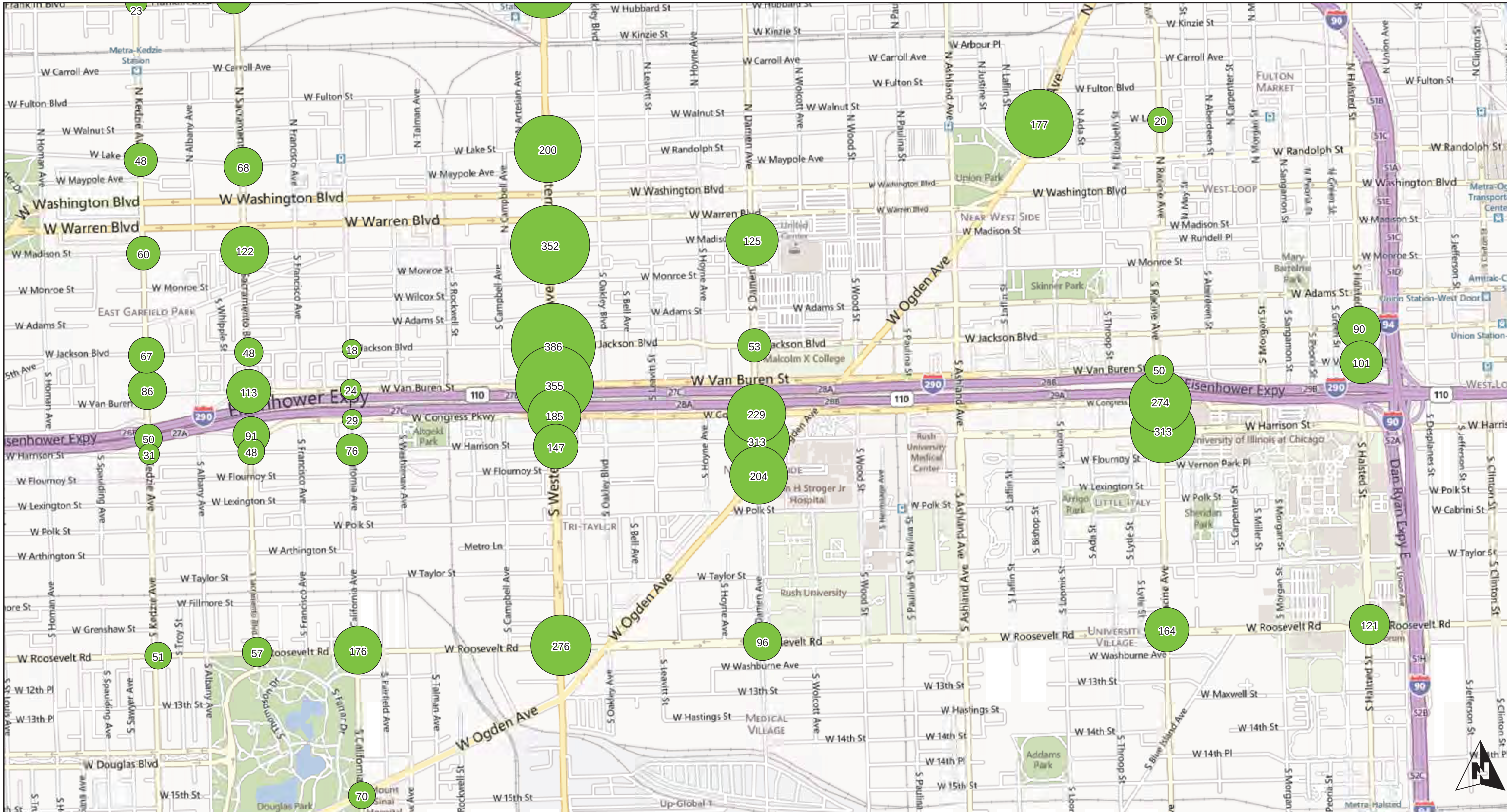
**Screenline Percent**

5%

10%

25%

50%




0 0.125 0.25 0.5 Miles

# Ashland BRT Off-Corridor Analysis--Diverted Volumes Existing to Build Alternative (PM Peak)

**Legend**

XX Total Volume Increase during Peak Period

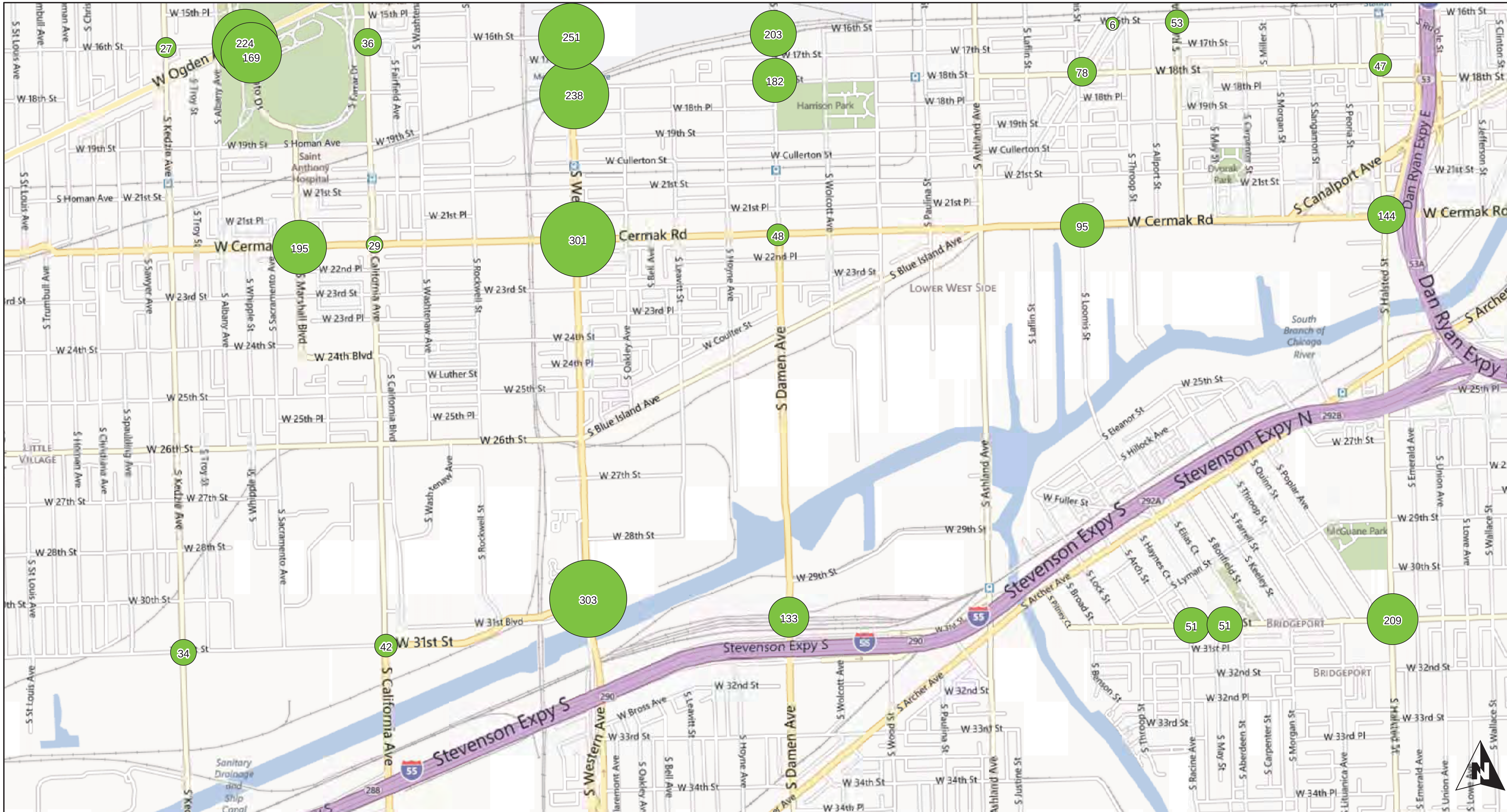
**Screenline Percent**

5%

10%

25%

50%




0 0.125 0.25 0.5 Miles