# ENVIRONMENTAL ASSESSMENT

Circle Interchange

I-90/I-94 and I-290/Congress Parkway

Job No. P-91-259-12

Cook County, Illinois

June 2013


Illinois Department of Transportation
Division of Highways/Region 1/District 1

Illinois Department of Transportation

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Submitted Pursuant to 42 USC 4332 (2)(c)
by the

U. S. Department of Transportation
Federal Highway Administration

and

Illinois Department of Transportation

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For IDOT

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For FHWA

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The purpose of the project is to provide an improved transportation facility at the interchange of Interstate 90/94 and Interstate 290/Congress Parkway, known as the Circle Interchange, by addressing the existing and 2040 transportation needs. This will be accomplished by improving safety, mobility, and facility condition and deficiencies of the mainline and interchange. This project is aligned with the priorities within the Chicago Metropolitan Agency for Planning (CMAP) *Go To 2040* plan. The distance is approximately 1.5 miles along I-90/94, and approximately 1.2 miles along I-290/Congress Parkway, for a total length of 2.7 miles along study area routes. See Appendix A, Exhibit 1, Study Area Map. The study area is located in Cook County, Illinois and within the limits of the City of Chicago (See Figure 1, Project Location Map, within the following Section).

The proposed action includes the reconstruction of the interstate routes to provide four basic mainline lanes on I-90/94 and three basic mainline lanes on I-290/Congress Parkway throughout the limits of improvement, generally following the existing alignment; two new flyover ramps will be constructed, nine cross street bridges will be replaced, merge/diverge lengths will be improved, and aesthetic treatments will be included. Some ramp accesses will be reconfigured to improve safety and operations.

Construction of the proposed action will require 0.1 acres of proposed right-of-way from one parcel and 0.2 acres of temporary easements from six parcels. No natural or biological resources will be involved. Noise abatement walls are proposed at six locations to mitigate identified impacts. An NPDES permit will be required as the proposed improvements will disturb more than an acre.

Illinois Department of Transportation

## SECTION I: INTRODUCTION & PURPOSE AND NEED

### 1. Introduction

The Circle Interchange project is located within the City of Chicago, Cook County. The project study area is along Interstate 90/94 (I-90/94) from south of Roosevelt Road (on the south) to north of Lake Street (on the north), along Interstate 290 (I-290) from Loomis Street (on the west) to the Circle Interchange; and along Congress Parkway from the Circle Interchange to Canal Street/Old Post Office (on the east). The distance along each expressway is approximately 1.5 miles for I-90/94 and approximately 1.2 miles for I-290/Congress Parkway, for a total length of 2.7 miles along study area routes. The routes typically have three lanes of traffic in each direction with mostly one lane ramps at the interchanges. Locally, the north leg is known as the Kennedy Expressway, the south leg as the Dan Ryan Expressway and the west leg as the Eisenhower Expressway. Refer to Figure 1, for the Project Location Map.

The Circle Interchange was built in the late 1950s and early 1960s as part of the Interstate Highway System. It is under the jurisdiction of the Illinois Department of Transportation (Department). Since its original construction there have been no substantial improvements to the roadways or bridges. Many of the bridge decks are nearing the end of their service life and need to be replaced.

I-90/94 and I-290 are fully access-controlled facilities and serve local, regional and interstate traffic. They are vital links in the transportation network for the Chicago Metropolitan Area. I-90/94 and I-290 are also part of the National Highway System and the Strategic Highway Network (STRAHNET), which is a network of interstate and other major routes. The STRAHNET designation is given to roads that provide "*defense access, continuity, and emergency capabilities for movements of personnel and equipment in both peace and war.*"[1]

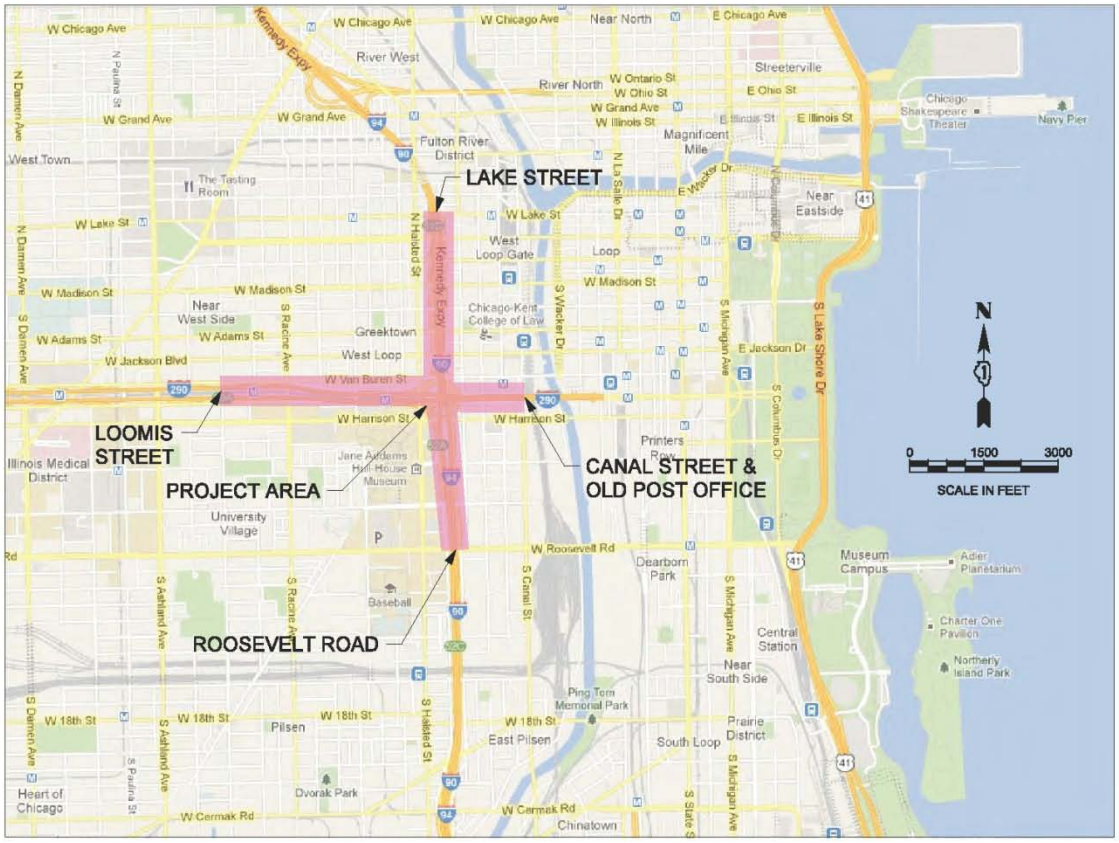
Within the study area, there are several cross street bridges over I-90/94 and I-290. Along I-90/94, from south to north, the cross street overpasses include Roosevelt Road, Taylor Street, Harrison Street, Van Buren Street, Jackson Boulevard, Adams Street, Monroe Street, Madison Street, Washington Street, Randolph Street, and Lake Street. Along I-290, from west to east, the cross streets overpasses include Loomis Street, Racine Avenue, Morgan Street, Peoria Street, and Halsted Street. Peoria Street allows only pedestrian traffic as it provides access to the CTA Blue Line station located in the median of I-290 and connects the UIC campus located both north and south of I-290. Congress Parkway is elevated above the cross street system and passes above Des Plaines Street, Jefferson Street, Clinton Street and Canal Street.

Full and partial interchanges surround the Circle Interchanges that serve the cross streets. Along I-90/94, these include Roosevelt Road, Taylor Street, Jackson Boulevard, Adams Street, Monroe Street, Madison Street, Washington Boulevard, Randolph Street, and Lake Street. Along I-290/Congress Parkway, these include Racine Avenue, Morgan Street and Canal Street.

Within this EA, the system ramps within the Circle Interchange are designated with a two-letter description. For instance, *Ramp NW* refers to the ramp that connects northbound I-90/94 and westbound I-290; *Ramp ES* refers to the ramp that connects eastbound I-290 with southbound I-90/94.

[1] Source: DOD web page at https://www.tea.army.mil/pubs/res/dod/pmd/STRAHNET.htm.

Figure 1 Project Location Map





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Circle INTERCHANGE

PROJECT LOCATION MAP

April 26, 2013

## *2.* Purpose and Need

### 2.1 Purpose

The purpose of the project is to provide an improved transportation facility at the interchange of Interstate 90/94 and Interstate 290/Congress Parkway, known as the Circle Interchange, by addressing the existing and 2040 transportation needs. This will be accomplished by improving safety, mobility, and facility condition and deficiencies of the mainline and interchange. This project is aligned with the priorities within the Chicago Metropolitan Agency for Planning (CMAP) *Go To 2040* plan. The project was adopted into the plan at the March 13, 2013 CMAP Board meeting.

### 2.2 Project Location

The Circle Interchange project is located within the City of Chicago, Cook County. The project study area is along I-90/94 from Roosevelt Road (on the south) to Lake Street (on the north), and along I-290/Congress Parkway from Canal Street / the Old Post Office Building (on the east) to Loomis Street (on the west). The distance is approximately 1.5 miles along I-90/94, and approximately 1.2 miles along I-290/Congress Parkway, for a total length of 2.7 miles along study area routes. See Exhibit 1, Study Area Map. Immediately within the interchange, each route has three lanes of traffic in each direction. Seven of the eight ramps at the interchange have one lane, with Ramp ES having two lanes. Outside of the interchange, I-90/94 typically has five lanes in each direction, while I-290/Congress Parkway has four lanes in each direction. The adjacent land use to the project study area includes a mix of residential (high-rise condominium complexes), commercial, institutional (University of Illinois at Chicago (UIC)), medical (Rush and UIC Medical Centers), and transit. The CTA Blue Line is located within the median of I-290 and goes underground just west of the interchange.

I-90/94 and I-290 are fully access controlled facilities. They serve local, regional, and interstate traffic and are vital links in the transportation network for the Chicago Metropolitan Area. Interstate 90/94 and Interstate 290 are also part of the National Highway System and the Strategic Highway Network (STRAHNET), which is a network of Interstate and other major routes. The STRAHNET designation is given to roads that provide "*defense access, continuity, and emergency capabilities for movements of personnel and equipment in both peace and war.*"[2]

Within the study area, there are several cross road bridges over I-90/94 and I-290/Congress Parkway. Along I-90/94, from south to north, the cross roads include Roosevelt Road, Taylor Street, Harrison Street, Van Buren Street, Jackson Boulevard, Adams Street, Monroe Street, Madison Street, Washington Boulevard, Randolph Street, and Lake Street. Along I-290/Congress Parkway, from east to west, the cross roads include Canal Street, Clinton Street, Jefferson Street, Des Plaines Street, Halsted Street, Peoria Street, Morgan Street, and Racine Avenue. Canal Street, Clinton Street, Jefferson Street, and Des Plaines Street travel underneath Congress Parkway. The other roadways travel over I-290. Also, Peoria Street is a pedestrian only bridge providing access across I-290 and to the CTA Blue line station located in the median of I-290.

### 2.3 Project Background

The Circle Interchange is one of the worst bottlenecks in the country for traffic congestion. The Interchange connects I-90/94 (Dan Ryan Expressway) to the south (ADT 257,800), I-290 (Eisenhower Expressway) to the west (ADT 189,700), Congress Parkway (ADT 86,000) to the east, and I-90/94 (Kennedy Expressway) to the north (ADT 259,700). Over 400,000 vehicles and trucks travel through the interchange daily. The interchange experiences breakdown conditions for many hours of the day, causing substantial queuing in every direction. As a result, it was ranked as the No. 1 freight bottleneck in the country based on a study completed by the American Transportation Research Institute (ATRI) and the Federal Highway Administration (FHWA) Office of Freight Management and Operations. The study monitored 250 highway locations. The Circle Interchange had "*the highest congestion index and therefore has the highest level of congestion that significantly impacts trucking*".[3] Based on a mainline free flow

[2] Source: DOD Web page at https://www.tea.army.mil/pubs/res/dod/pmd/STRAHNET.htm

[3] Source: ATRI Web page at http://atri-online.org/2011/10/01/fpm-congestion-monitoring-at-250-freight-significant-highway-locations

speed of 55 miles per hour (mph), the study determined the Average Speed for the interchange was 29 mph, with a Peak Average Speed of 22 mph and a Nonpeak Average Speed of 32 mph.[4]

The Chicago Metropolitan Agency for Planning (CMAP), the regional Metropolitan Planning Organization in which this project is located, has prepared a comprehensive regional plan titled *Go To 2040.* According to this plan, CMAP estimates that approximately 67 percent of annual regional freight tonnage occurs on roadways. Of this total, 36 percent is through traffic that is passing through the area. *Go To 2040* states that "the biggest challenge to trucking is highway congestion."[5]

Public Outreach to various project stakeholders and community groups has been initiated and is on-going. The early outreach led by the Department resulted in the 2010 Master Plan Report titled *Master Plan Study of I-290/90/94 from Western Street to Wells Street and Polk Street to Hubbard Street* based on the existing interchange geometry. The Master Plan is a separate document available at the Illinois Department of Transportation, District 1 Office in Schaumburg, Illinois. The Master Plan focused on the following elements (listed as discussed in the study document):

- Art, Global Stature, and Branding
- Maintenance and Safety Access
- Sustainability and New Technologies
- Wayfinding and Community Connectivity
- Landscape Concepts
- Hardscape Concepts and Edge Treatments

This *Master Plan* followed the principals of Context Sensitive Solutions (CSS) – key stakeholders were identified and four Stakeholder Meetings were held in the course of the study. The Circle Interchange project has continued from the public outreach already started with the *Master Plan* study.

The improvements to the Circle Interchange as proposed will function independently, yet be compatible with the *2010 Master Plan*, the improvements currently being studied along I-290 to the west, and the improvements recently completed to the north and south along the Kennedy Expressway and the Dan Ryan Expressway, respectively.

*Go To 2040* recommends that the region prioritize investments toward strategic enhancements and modernization of the transportation system.[6] The Fiscal Year (FY) 2010-2015 Transportation Improvement Program (TIP), endorsed by CMAP, includes this project as No. 01-12-0019. The Circle Interchange project is adjacent to another major improvement study – the I-290 Multimodal Corridor project. This project is located between Mannheim Road to Racine Avenue and is included in *Go To 2040*.

## 2.4 Need for the Proposed Action

### 2.4.1 Improve Safety

A review of the crash history within the study limits was completed for the three-year study period from 2006 through 2008. Refer to the *Crash Analysis of Existing Conditions* report for the full analysis. The report can be found under separate cover and is available at the Illinois Department of Transportation (Department) District 1 Office in Schaumburg, Illinois. Crashes have been tabulated by year, crash type, injury type, and roadway conditions to ascertain overall trends and determine if any particular statistical overrepresentation exists that would warrant special countermeasure considerations.

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[4] Source: ATRI Web page at http://atri-online.org/2011/10/01/fpm-congestion-monitoring-at-250-freight-significant-highway-locations

[5] Source: *Go To 2040 Comprehensive Regional Plan*, Chicago Metropolitan Agency for Planning, 2010, pg. 309

[6] Ibid, pg. 272

Crash report data and associated Traffic Crash Reports from the state and local police were obtained from the Department's Division of Traffic Safety. In addition, site visits, field observations, and a meeting was conducted in July 2012 with first responders and emergency service providers. A total of 2,819 crashes occurred within the study area from January 1, 2006 through December 31, 2008, the most recent years of unrestricted operation. From 2009 to present, major construction projects have been undertaken near the Circle Interchange, including reconstruction of Wacker Drive and the bridge carrying Congress Parkway over the Chicago River.

There were 1,912 crashes along I-90/94, 615 crashes along I-290/Congress Parkway, 208 crashes on the Circle System Ramps, and 84 crashes on the nearby Service Ramps. See Table 1 for a breakdown of the crash experience totals.

Table 1 Total Crashes by Injury Severity (2006-2008)

| Location | Crashes by Year | | | | Maximum Injury Sustained Per Crash | | | | | | Crash Severity |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2006 | 2007 | 2008 | Total | K | A | B | C | None | Total | KAB |
| I-90/94 | 590 | 677 | 645 | 1,912 | 1 | 18 | 90 | 66 | 1,737 | 1,912 | 5.7% |
| I-290/Congress Parkway | 204 | 220 | 191 | 615 | 1 | 9 | 36 | 30 | 539 | 615 | 7.5% |
| Circle System Ramps | 55 | 65 | 88 | 208 | 2 | 6 | 12 | 11 | 177 | 208 | 9.6% |
| Nearby Service Ramps | 17 | 34 | 33 | 84 | 0 | 0 | 4 | 0 | 80 | 84 | 5.0% |
| Total | 866 | 996 | 957 | 2,819 | 4 | 33 | 142 | 107 | 2,533 | 2,819 | 6.3% |

Of the 2,819 crashes from 2006 through 2008, 286 crashes or 10 percent resulted in injuries. During the 2006 through 2008 period there were four Type K (fatality) crashes, 33 Type A (incapacitating injury) crashes, 142 Type B (non-incapacitating injury), and 107 Type C (reported, injury not evident) crashes. The highest percentage of severe crashes (KAB) occurred on the Circle System Ramps.

The four fatal (Type K) crashes resulted in eight total fatalities. The crash reports cited the primary contributing causes of the crash were 2-driving skill/knowledge/experience, 1-erratic/reckless operation of vehicle, and 1-driving on the wrong side/wrong way. Two of the crashes involved motorcycles. The crash conditions were 4-clear weather and dry pavement, 3-on lighted roadways during hours of darkness, and 1-during daylight hours. Blood alcohol content tests were not performed at the scene except for one crash, where the report indicated that the driver's blood did not contain alcohol.

Table 2 Total Crashes by Collision Type (2006-2008)

| Crash Type | I-90/94 | I-290/ Congress | Circle Ramps | Service Ramps | Total | Percentage |
|---|---|---|---|---|---|---|
| Rear-end | 1,101 | 370 | 82 | 48 | 1,601 | 56.8% |
| Sideswipe – Same | 684 | 176 | 63 | 18 | 941 | 33.4% |
| Fixed Object | 87 | 48 | 49 | 14 | 198 | 7.0% |
| Other, Non-Collision | 7 | 5 | 4 | 0 | 16 | 0.6% |
| Angle | 10 | 3 | 1 | 2 | 15 | 0.5% |
| Other Object | 7 | 5 | 3 | 0 | 15 | 0.5% |
| Overturned | 3 | 3 | 5 | 1 | 12 | 0.4% |
| Parked Motor Vehicle | 6 | 2 | 0 | 1 | 9 | 0.3% |
| Sideswipe – Opposite | 3 | 1 | 0 | 0 | 4 | 0.1% |
| Pedestrian | 3 | 0 | 0 | 0 | 3 | 0.1% |
| Turning | 1 | 0 | 1 | 1 | 3 | 0.1% |
| Head-On | 0 | 2 | 0 | 0 | 2 | 0.1% |
| Total | 1,912 | 615 | 208 | 84 | 2,819 | 100.0% |

The most common type of crash was rear end, accounting for 56.8 percent of the total crashes from 2006 through 2008. The next most common crash type was sideswipe same direction and fixed object for an additional 40.4 percent of the total crashes in 2006 through 2008. These are summarized in Table 2. The predominant crash types are indicative of a roadway facility that needs improvements to its capacity; its geometrics as it relates to merge/diverge maneuvers and decisions points; and its physical condition and design as it relates to horizontal and vertical clearances.

Review of the roadway surface condition from 2006 through 2008 found that over 84.5 percent of all crashes occurred on a dry roadway surface, with 13.6 percent of crashes occurring on wet, snowy, or icy pavement conditions. These are summarized in Table 3. The analysis suggests that wet pavement was not a major cause for crashes within the study area. Similarly, a review of the roadway lighting conditions for that same period showed 66.7 percent of the crashes occurred in daylight conditions, 29.8 percent of the crashes occurred during night hours in lighted conditions, and two percent occurred during night hours in unlighted conditions. These are summarized in Table 4.

Table 3 Total Crashes by Roadway Condition (2006-2008)

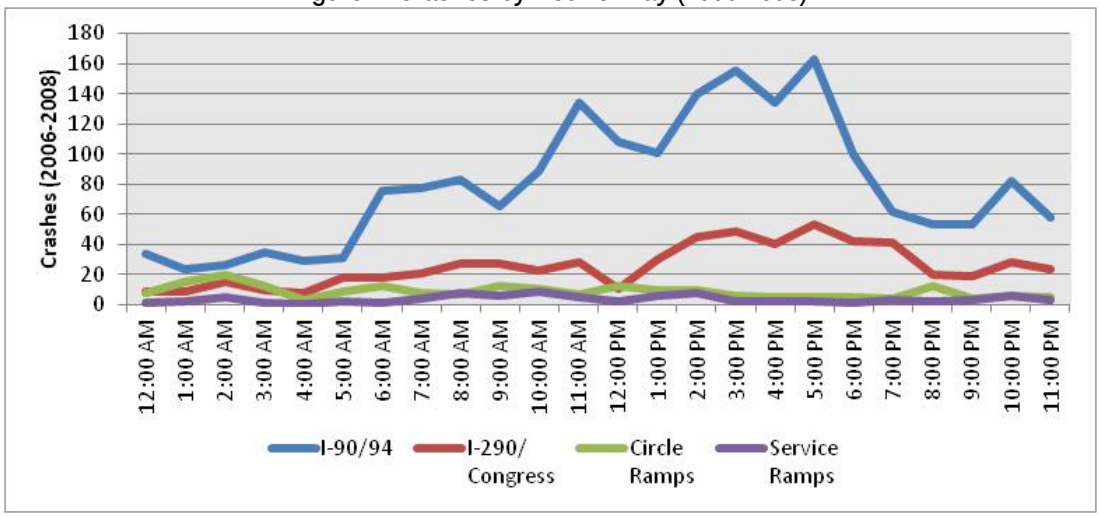
| Roadway Conditions | I-90/94 | I-290/ Congress | Circle Ramps | Service Ramps | Total | Percentage |
|---|---|---|---|---|---|---|
| Dry | 1,636 | 508 | 167 | 70 | 2,381 | 84.5% |
| Wet | 205 | 76 | 32 | 7 | 320 | 11.4% |
| Unknown | 35 | 14 | 3 | 2 | 54 | 1.9% |
| Snow or Slush | 26 | 12 | 3 | 2 | 43 | 1.5% |
| Ice | 10 | 5 | 3 | 3 | 21 | 0.7% |
| Total | 1,912 | 615 | 208 | 84 | 2,819 | 100.0% |

Table 4 Total Crashes by Lighting Conditions (2006-2008)

| Lighting Conditions | I-90/94 | I-290/ Congress | Circle Ramps | Service Ramps | Total | Percentage |
|---|---|---|---|---|---|---|
| Daylight | 1,330 | 383 | 111 | 57 | 1,881 | 66.7% |
| Darkness, Lighted | 514 | 214 | 86 | 25 | 839 | 29.8% |
| Darkness | 37 | 9 | 7 | 2 | 55 | 2.0% |
| Dusk | 19 | 4 | 1 | 0 | 24 | 0.9% |
| Dawn | 8 | 2 | 3 | 0 | 13 | 0.5% |
| Unknown | 4 | 3 | 0 | 0 | 7 | 0.2% |
| TOTALS | 1,912 | 615 | 208 | 84 | 2,819 | 100.0% |

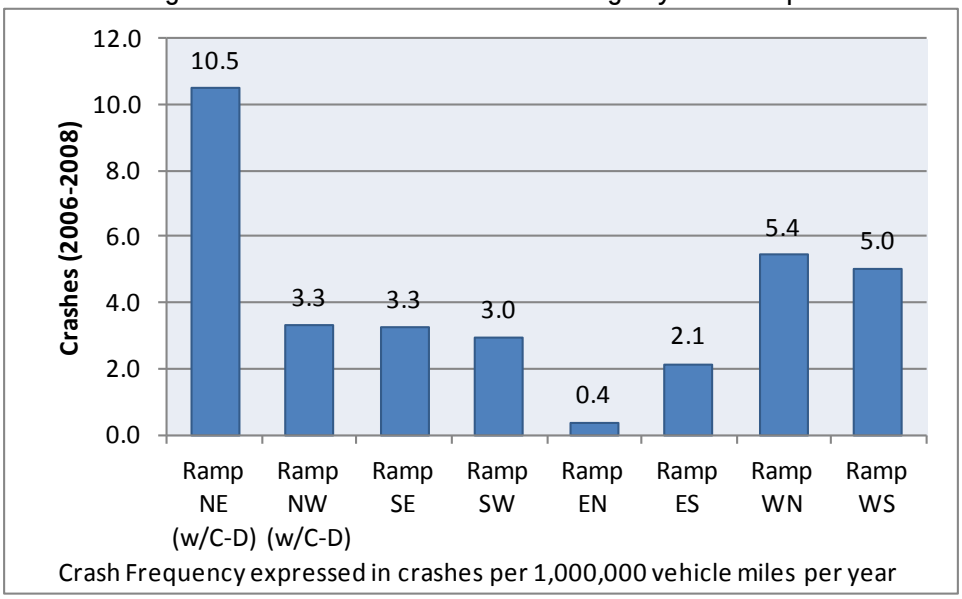
The time of day and day of week analysis showed that the number of crashes increased proportionately with the increase in traffic volumes. Although the number of crashes increased steadily as the day progressed, the peak was highest during the period between 2:00 PM and 5:00 PM. This is illustrated in Figure 2.

Figure 2 Crashes by Hour of Day (2006-2008)




A review of crashes along the eight Interchange System Ramps showed that 208 crashes occurred on the ramps. Nearly half the crashes (100) occurred on Ramp NW (northbound to westbound) and one-quarter (45) of the crashes occurred on Ramp ES (eastbound to southbound). The system ramps crashes are illustrated on Figure 3.

Figure 3 Crash Rates at Circle Interchange System Ramps




* C-D denotes a collector-distributor roadway

From the review of the crash data and patterns collectively, the Circle Interchange exhibits a need for improvement to the existing facility. The predominant crash types of rear end and sideswipe crashes are consistent with congested traffic conditions and substandard facility geometrics. This supports the need for improvement to merges and weaves, longer distances between decision points, and additional capacity. The crash history on the system ramps shows a need to improve capacity on the ramps and upgrade the ramp geometry to meet current design standards, especially for Ramp NW (northbound to westbound) and Ramp ES (eastbound to southbound).

### 2.4.2 Improve Mobility

According to CMAP, the region's congestion levels are among the highest in the nation. Projected increases in population, jobs and freight traffic will only add to the pressure on the existing infrastructure. CMAP sees this as one of the greatest threats to the region's future prosperity. Goals of public investment should be to reduce impacts of freight operations on local communities, addressing travel delay, pollution and safety[7].

The existing average daily traffic (ADT) volumes along the Circle Interchange routes are as follows:

- I-90/94 (Dan Ryan Expressway) to the south – 257,800 ADT
- I-290 (Eisenhower Expressway) to the west – 189,700 ADT
- Congress Parkway to the east – 86,000 ADT
- I-90/94 (Kennedy Expressway) to the north – 259,700 ADT

The Circle Interchange serves over 400,000 vehicles per day, with a peak hour flow of nearly 20,000 vehicles per hour. Westbound I-290, west of Circle Interchange carries on average 9,900 trucks per day and the northbound I-90/94 (Dan Ryan Expressway) carries on average 16,000 trucks per day. The interchange experiences breakdown conditions for many hours of the day, causing substantial congestion in all directions. Unlike many expressway systems that show sharp peaks in traffic during weekday AM and PM rush hours, the Circle Interchange experiences heavy congestion throughout the day and into the evening, including weekends. Traffic volumes peak sharply around 7:00 AM and remain relatively high throughout the afternoon and evening until about 9:00 PM.

[7] Source: *Go to 2040 Comprehensive Regional Plan,* Chicago Metropolitan Agency for Planning, 2010, pg. 313

The traffic congestion at the Circle Interchange can best be described in terms of traffic queuing and travel time. Traffic congestion occurs in the northbound, southbound and eastbound directions approaching the interchange.

In the northbound direction (along the Dan Ryan Expressway), traffic queues approaching the Circle Interchange typically extend over 2.5 miles to 26th Street at most times during the day. During the PM peak, this queue often extends further south to 31st Street. The queue appears to be caused by the reduction to three northbound lanes on I-90/94 at the Circle Interchange as well as insufficient capacity on the northbound-to-westbound ramp. Throughout much of the day, a trip from 31st Street to the Circle Interchange takes eight to ten minutes; a distance of about three miles. During the PM peak, this same trip will take approximately 26 minutes. In free flow conditions at 55 mph, this trip would take just over three minutes.

Figure 4 Typical Northbound Congestion in the PM Peak Approaching the Circle Interchange


In the southbound direction (along the Kennedy Expressway), traffic queues approaching the Circle Interchange typically extend over a mile to Grand Avenue. The queue appears to be caused by reduction to three southbound lanes on I-90/94 at the Circle Interchange. In free flow conditions, a trip from Chicago Avenue to the Circle Interchange, a distance of 1.75 miles, should take just over two minutes at 45 mph (the posted speed limit). During the PM peak hour, this same trip takes approximately 10 minutes. Additionally, the southbound-to-westbound one lane ramp movement hovers near capacity with approximately 1,800 vehicles per hour during the AM peak hour.

Figure 5 Typical Southbound Congestion in the PM Peak Approaching the Circle

In the eastbound direction (along the Eisenhower Expressway), traffic queues build from the divergence to the I-90/94 ramps (near Peoria Street) westward to Ashland Avenue; a distance of about 4,600 feet. This congestion appears to be caused by a saturated eastbound-to-northbound one lane ramp. This ramp carries approximately 1,400 vehicles per hour in the AM peak on a tight curvilinear alignment. The queue from this ramp suggests that the traffic demand is much higher than 1,400 vehicles per hour. Congestion on this ramp also impacts access to the eastbound-to-southbound two-lane ramp, which carries approximately 2,100 vehicles per hour in the AM peak.

Based on the traffic observations and the existing traffic volumes, the Circle Interchange is operating under supersaturated conditions as evident from the long traffic queues and travel times. These conditions support the need to improve mobility for the Circle Interchange. Improved mobility for passenger and freight vehicles is consistent with the goals of *Go To 2040*.

### 2.4.3 Facility Deficiencies

According to *Go To 2040*, the region's infrastructure is aging, and in some cases deteriorating.[8] The Circle Interchange originally constructed in the 1950s, is an example of aging infrastructure. It has deficiencies that impact the operation of the interchange. Operational deficiencies are best analyzed by identifying geometric elements that do not meet current design criteria, as well as taking an inventory of the facility condition.

Geometric Deficiencies

Multiple geometric elements are deficient at certain locations within the Circle Interchange. These include steep grades, sharp curves, narrow lane and shoulder widths, vertical bridge clearances, entrance and exit ramp tapers, and triple divergences. A divergence is a point where traffic splits. Ideally, a divergence would have only two splits requiring the driver to make only one decision of which way to proceed.

Additionally, the basic number of through lanes before, through, and after the interchange is not consistent. Along I-90/94, traveling south to north, the basic number of through lanes changes from five lanes in each direction, to three lanes in each direction through the Circle Interchange, back to five lanes in each direction. Along I-290/Congress Parkway, traveling east to west, the basic number of through lanes changes from four lanes in each direction, to three lanes in each direction through the interchange, back to four lanes in each direction. Having an "unbalanced" number of lanes along the project routes contributes to the facility deficiencies and function. Ideally, the number of lanes should be balanced and consistent along the project routes and through the interchange.

The proposed mainline design speed of I-90/94 and I-290/Congress Parkway is 60 mph. Therefore based on the Department design guidelines, the initial ramp curves coming from the mainline should use a design speed of 45 mph. The ramps that do not meet this criterion include Ramp NE (30 mph), Ramp NW (30 mph), Ramp EN (30 mph), Ramp ES (40 mph) and Ramp WS (30 mph). Note that Ramp NE and Ramp NW originate from a northbound C-D (collector-distributor) road that operates in a similar manner to the northbound mainline.

The System Ramps contain several deficiencies related to steep grades and sharp curves. The maximum criterion for ramp slopes is 4.00 percent and desirably a 25 mph design speed for curves. Six ramps within the interchange are deficient and do not meet either or both the slope and the curve speed criteria.

The desired travel lane width is 12 feet. Certain lane widths are less than this width, specifically eastbound and westbound Congress Parkway approaching the Old Post Office, where lanes are approximately 9.5 feet wide.

Similarly, mainline shoulder widths should be 12 feet. However, there are several locations throughout the project area which do not meet current design standards. Along northbound and southbound I-90/94, the existing shoulder widths vary between four and five feet. Along eastbound and southbound I-290/Congress Parkway, the deficient shoulder widths are as narrow as two feet. For the system ramps the Department design guideline criteria is six feet

[8] Source: *Go To 2040 Comprehensive Regional Plan*, Chicago Metropolitan Agency for Planning, 2010, pg. 42

for left shoulders and eight feet for right shoulders. The eight system ramps generally provide four-foot wide left and right shoulders.

The Circle Interchange project includes a number of crossroad bridges over the interstate. The minimum allowable vertical clearance is 15'-0". According to field measurements, several of these bridges fall below this criterion. The most deficient location is at Jackson Street, which has a measured vertical clearance of 13'-10½".

As for taper lengths, there are several locations that do not meet the design guidelines for entrance and exit tapers. These include nine locations which do not meet the entrance taper requirement and nine other locations which do not meet the exit length requirements.

A triple divergence (decision point) exists at two locations that lack appropriate decision sight distance. Design guidelines recommend that two successive decisions shall be separated by 800 feet (BDE Figure 37-2.D)[9] within a system interchange. The physical separation involving eastbound I-290 and the ramps to southbound and northbound I-90/94 is separated from the successive decision point involving the southbound and northbound ramps by only 280 feet. The gore separating westbound I-290 and Ramps WS/WN is 340 feet upstream from the gore separating Ramps WS and Ramp WN. Based on signing, there is virtually no separation within these two groups of decision points.

An Accident Investigation Site (AIS) is located immediately south of the Circle Interchange, in the median between northbound and southbound I-90/94. The AIS is separated from mainline traffic by barrier wall. Breaks in the barrier wall provide ingress and egress to the AIS. Other than shoulders, there are no acceleration or deceleration areas serving the AIS, which represent a deficiency.

Facility Condition

There have been no major improvements made to the Circle Interchange since its construction in the 1950s. Maintenance and repairs have been made to extend the service life of the interchange roadway pavement and ramp bridge decks and structures. Improvements and repairs have been made to several of the cross street bridges over I-90/94 (Kennedy and Dan Ryan Expressways) as part of major reconstruction projects along both expressways during the mid to late 1990s. However, many of the bridge decks are nearing the end of their service life and need replacement. Other past improvements included the following:

- 1988, I-290 Resurfacing from Central to Circle
- 1985, I-90/94 Reconstruction, Northbound Mainline from 28th Place to Maxwell Street
- 1985, I-90/94 Reconstruction, CD Roads and Ramps from Maxwell Street to I-290
- 1975, I-290 Resurfacing from Sacramento thru Circle

More recently, as part of the *Master Plan Study of I-290/90/94 from Western Street to Wells Street and Polk Street to Hubbard Street*, a maintenance contract was completed in November 2011 to implement some of the proposed elements of the plan. The improvements included construction of barrier walls, signing, drainage, and some landscaping.

The existing geometric deficiencies and the aging condition of the facility substantiates the need to address the deficiencies and improve the condition of the Circle Interchange to better serve the motoring public now and into the future.

[9] Source: http://www.dot.il.gov/desenv/BDE%20Manual/BDE/pdf/Chapter%2037%20Interchanges.pdf

## SECTION II: AFFECTED ENVIRONMENT TABLE

The table below includes a summary of the various environmental resources that are present within the project area and whether or not the proposed improvement will affect that resource. Impacts to each of these resources are discussed in detail in Section IV.

| Environmental Resources/Conditions | Resource/Condition Present? | | |
|---|---|---|---|
| | Yes | No | Present But Not Affected |
| **I. Social/Economic** | | | |
| 1. Community Cohesion | X | | |
| 2. Environmental Justice and Title VI | | X | |
| 3. Public Facilities and Services | X | | |
| 4. Changes in Travel Patterns and Access | X | | |
| 5. Relocations (Business and Residential) | | X | |
| 6. Economic Impacts | X | | |
| 7. Land Use | | X | |
| 8. Growth and Economic Development | | | X |
| 9. Pedestrian and Bicycle Facilities | X | | |
| **II. Agricultural** | | | |
| 1. Farms and Farmland Conversion | | X | |
| 2. Prime and Important Soils | | X | |
| 3. Severed/Landlocked Parcels | | X | |
| 4. Adverse Travel | | X | |
| **III. Cultural Resources (Historic Properties)** | | | |
| 1. Archeological Sites | | X | |
| 2. Historic Bridges | | X | |
| 3. Historic Districts | | X | |
| 4. Historic Buildings | | | X |
| **IV. Air Quality** | | | |
| 1. Microscale Analysis | | | |
| a. Does project add through lanes or auxiliary turning lanes? | X | | |
| b. Has COSIM 4.0 been used? | X | | |
| 2. Air Quality Conformity | | | |
| a. Is project in a non-attainment or maintenance area? | X | | |
| 3. Is project located in a PM 2.5 or PM 10 non-attainment or maintenance area | X | | |
| 4. Construction-Related Particulate Matter | X | | |
| 5. Mobile Source Air Toxics | X | | |
| **V. Noise** | | | |
| 1. Is this a Type I project? | X | | |
| a. Noise impacts | X | | |
| b. Does abatement meet feasibility and reasonableness criteria? | X | | |
| 2. Is this a Type III project? | | X | |
| **VI. Natural Resources** | | | |
| 1. Upland Plant Communities | | | |

| Environmental Resources/Conditions | Resource/Condition Present? | | |
|---|---|---|---|
| | Yes | No | Present But Not Affected |
| a. Does the project impact wooded areas (Trees)? | | X | |
| b. Does the project impact Prairie? | | X | |
| c. Does the project occur within an Illinois Department of Agriculture quarantine area for an invasive species? | | X | |
| 2. Wildlife Resources | | | |
| a. Does the project area contain Wildlife Habitat? | | X | |
| b. Does the project area contain breeding habitat for neotropical migrant species of birds? | | X | |
| c. Does the project area contain nesting Bald Eagles? | | X | |
| 3. Threatened and Endangered Species | | | |
| a. Does habitat exist for Federally listed species in the project area? | | X | |
| b. Did the EcoCAT response from IDNR indicate the presence of State-Listed Species in the project area? | | X | |
| **VII. Water Quality/Resources/Aquatic Habitats** | | | |
| 1. Does the project involve a waterbody? | | X | |
| 2. Does the project affect the physical features of a stream? | | X | |
| 3. Does the project affect the fish and/or mussels within the stream? | | X | |
| 4. Does the project affect either the narrative or numeric water quality standards? | | X | |
| 5. Does the project occur within an area listed as a navigable stream, nationwide river inventory, ADID stream, or have a rating under the Biological Stream rating system? | | X | |
| 6. Is the stream listed by IEPA as impaired and is it subject to TMDLs? | | X | |
| 7. Do the project impacts require mitigation? | | X | |
| **VIII. Groundwater Resources** | | | |
| 1. Is groundwater the primary source of potable water in the area? | | X | |
| 2. Does the project occur within an area of karst topography? | | X | |
| 3. Does the project occur within a watershed that has been designated by the IEPA as vital for a particularly sensitive ecological system? | | X | |
| 4. Does the project impact a Wellhead Protection Area? | | X | |

| Environmental Resources/Conditions | Resource/Condition Present? | | |
|---|---|---|---|
| | Yes | No | Present But Not Affected |
| | | | |
| 5. Does the project occur within an area where potable water supply wells are present? | | X | |
| 6. Does the project contribute to degradation of the areas Groundwater Quality? | | X | |
| 7. Does the project occur within an area designated as a special resources groundwater? | | X | |
| **IX. Floodplains** | | | |
| 1. Does the project occur within a 100-year floodplain? | | X | |
| 2. Does the project occur within the Regulated Floodway? | | X | |
| 3. Is a Floodplain Finding required? | | X | |
| **X. Wetlands** | | | |
| 1. Does the project impact Wetlands? | | X | |
| 2. Do the wetlands have an FQI of 20 or greater? | | X | |
| 3. Are the wetlands listed as an ADID Site? | | X | |
| 4. Attach the Wetland Impact Evaluation Form to the document | | X | |
| 5. Wetlands Finding | | X | |
| **XI. Special Waste** | | | |
| 1. Did project pass Level I screening? | | X | |
| 2. Did project pass Level II screening? | | X | |
| 3. Was a Preliminary Environmental Site Assessment (PESA) required? | X | | |
| a. Is All Appropriate Inquiry (AAI) required? | | X | |
| b. Were REC(s) identified in the PESA? | X | | |
| 4. Was a Preliminary Site Investigation (PSI) required? | X | | |
| **XII. Special Lands** | | | |
| 1. Section 4(f) | | X | |
| a. De Minimis, Programmatic, or Individual | | X | |
| 2. Section 6(f) | | X | |
| 3. Open Space Lands Acquisition and Development (OSLAD) Act Lands | | X | |
| 4. INAI Sites | | X | |
| 5. Nature Preserves | | X | |
| 6. Land & Water Reserves | | X | |
| **XIII. Indirect and Cumulative Impacts** | | | |
| 1. Indirect Impacts | X | | |
| 2. Cumulative Impacts | X | | |

| Additional Information | YES | NO |
|---|---|---|
| **XIV. Environmental Commitments/Permits/Certifications Required** | | |
| 1. Does the project require Section 404 Permit(s)? | | X |
| a. Is an individual, nationwide, or regional permit anticipated? | | X |
| 2. Will an individual Water Quality Certification from IEPA be required? | | X |
| 3. Will a Coast Guard Bridge Permit be required? | | X |
| **XV. Public Involvement** | X | |
| **XVI. Agency Coordination** | X | |