



I-270 North Corridor Study

Final Report
October 2012



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The I-270 North Corridor Study is the result of a cooperative effort between Missouri Department of Transportation, East-West Gateway Council of Governments, Metro, and St. Louis County Department of Highways and Traffic. The preparation of this document was financed by the Missouri Department of Transportation.

Community Advisory Group (CAG)

The Community Advisory Group served as advisers to the study team and provided feedback to the team throughout the planning process. Members also served as study ambassadors. The CAG was comprised of members of the community at large, elected officials, representatives of local public agencies, businesses and schools, advocacy groups, and law enforcement.

Thank you to the following for providing meeting space to engage the community throughout the project:

**St. Louis Community College – Florissant Valley
City of Bellefontaine Neighbors
St. Louis County Library -Prairie Commons Branch**

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Executive Summary

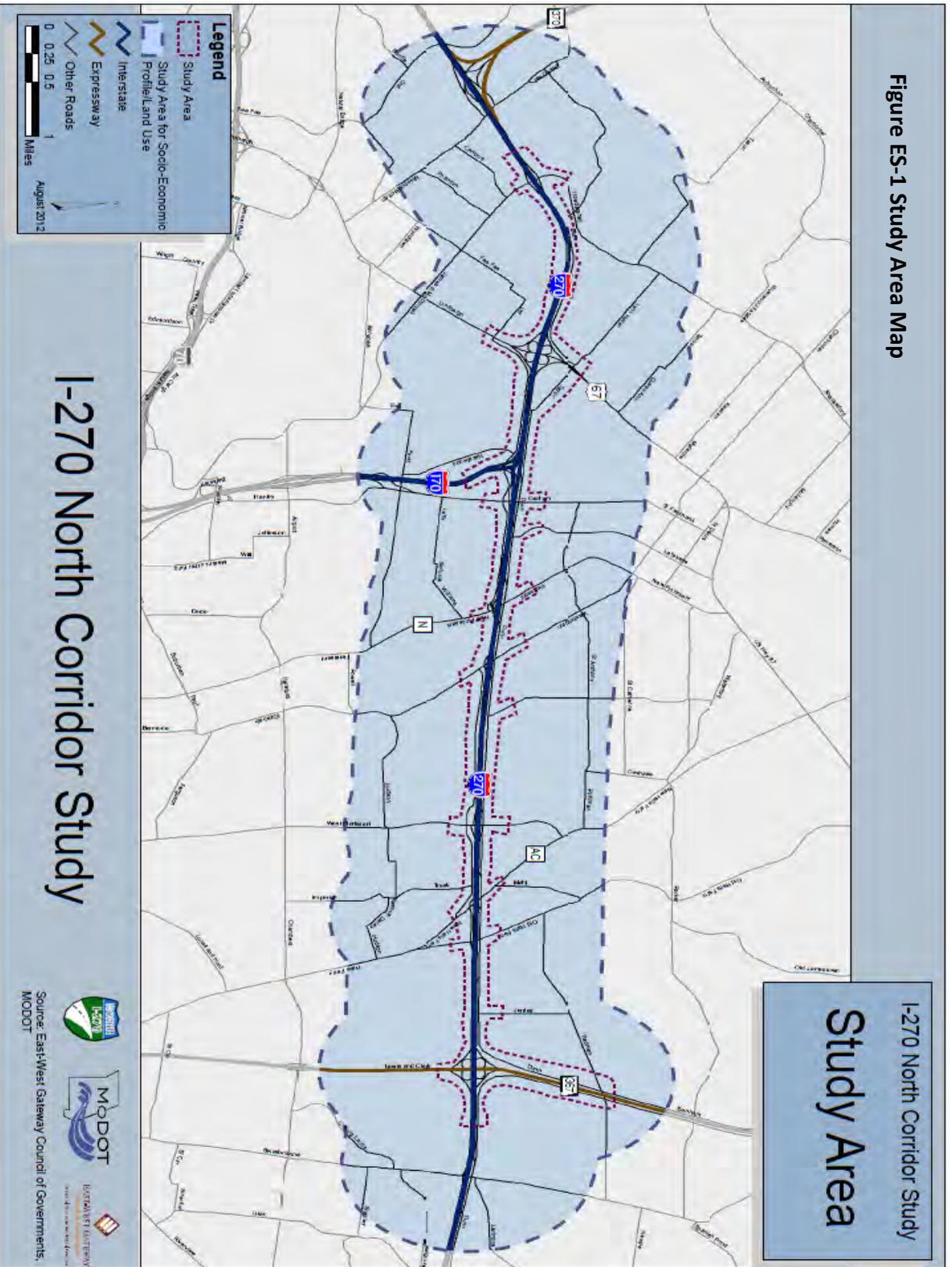
In March 2011, the Missouri Department of Transportation (MoDOT) initiated the Interstate 270 (I-270) North Corridor study to fully investigate the problems, needs, and opportunities along I-270 in North St. Louis County. The study focused on the I-270 mainline, the parallel outer roadways (Dunn Road and Pershall Road), and the connecting arterials, from just west of McDonnell Boulevard (Blvd) to east of Missouri Route 367 (Lewis and Clark Blvd). The study area is shown in Figure ES-1 on the following page. This study was a collaborative effort between MoDOT, East-West Gateway Council of Governments (EWG), Metro, and St. Louis County Department of Highways and Traffic. The study was guided by a study team comprised of representatives of these agencies.

Prior to the formal start of the study, MoDOT organized and facilitated a meeting with EWG, Metro, and others to brainstorm and formulate a set of goals and objectives for the study. These goals and objectives were based on what is known about the corridor as well as opportunities for enhancing its future viability. The refined goals and objectives of the study were to:

1. Identify and define the transportation problems and needs along the I-270 North Corridor, focusing on a 10-mile section of the I-270 mainline, and adjacent and connecting outer roads and arterials.
2. Develop system improvement solutions that are both practical and multimodal in scope, with emphasis placed on safety, capacity, and operational efficiency for all users of the corridor.
3. Enhance access opportunities and safety along the corridor for transit, bicycles, and pedestrians.
4. Recommend sets of both near- and long-term conceptual improvements for the corridor.
5. Partner with the communities of North St. Louis County to implement sound transportation improvement solutions and strategies that enhance economic and community growth.

The study team recognized that to successfully meet these objectives, the communities had to be meaningfully involved throughout the study process. As such the team developed a comprehensive and strategic public involvement plan with this goal in mind. One of these strategies designed to engage and elicit feedback from the various communities was to form a Community Advisory Group (CAG). The CAG consisted of various members from the community, elected leaders, representatives of local public agencies, business leaders, local school administrators, advocacy groups, and law enforcement. The CAG's primary role was to serve as advisors to the study team and provide feedback throughout the study process.

Figure ES-1 Study Area Map



Problem, Needs, and Opportunities

To fully understand the problems, needs, and opportunities of the study area, a comprehensive inventory of the corridor was undertaken to document the condition of the network of roads and bridges, sidewalks, traffic operations, and safety. As a kickoff to the study, meetings were held with both the CAG and the public to help determine the needs and problems along the corridor.

This study has identified several existing traffic operational, geometric, and safety constraints along the I-270 corridor in North St. Louis County. Among these constraints are: aging infrastructure; limited capacity on I-270 mainline; congested and closely-spaced interchanges; lack of and poor access for pedestrians and bicyclists; and confusing two-way cross-over slip ramps from I-270 to Dunn Road. With a forecasted increase in traffic of approximately 25% by the year 2040, it is anticipated that these constraints would worsen congestion, traffic operations, and safety on the corridor in the future.

Most of the crashes on I-270 and the adjacent roadways involve rear-ends collisions and they occur during periods of congestion. The cloverleaf interchanges at Lindbergh Boulevard (US 67) and Route 367 (Lewis & Clark Boulevard) are operating above capacity. The short weaving lengths leading to and away from these interchanges account for the highest percentage of crashes along I-270 within the study area. Safety issues on the arterials and outer roads are associated with congestion and poor access management. In recent years, MoDOT has installed traffic operation measures (e.g. signs, raised medians, striping) along Dunn Road at the two-way slip ramps to improve safety along this road. These improvements have resulted in less severe crashes at various locations along Dunn Road. However, the two-way slip-ramp intersections remain confusing intersections to negotiate or drive through.

The environmental and cultural resources along the corridor were also examined and documented. The I-270 North Corridor is in a highly urbanized setting. As such, there is limited number of natural and cultural resources. However, there are undeveloped areas, parks, and conservation areas that add green space to the corridor and contribute to the quality of the communities.

Equally as important, the team analyzed the socio-economic and demographic profiles of the study area. A number of potential Environmental Justice (EJ) considerations have been identified along the corridor including a high poverty rate; high percentage of elderly, persons with disabilities, and a sizable minority population; and high percentage of zero vehicle households. The ability to access public transportation is essential to those living along corridor. Currently, North County generates nearly 20% of the region's bus ridership and the demand for transit service is expected to grow substantially. In order to better serve this growing market,

Metro intends to build a new Transit Center and bus garage in North County. These facilities will be located on Pershall Road between West Florissant Avenue and New Halls Ferry Road (Route AC).

Interstate 270 also plays an important role in the movement of goods in and through the St. Louis Region. A recent study shows that over 93% of all the commercial vehicles serving the St. Louis region reported using I-270 as a primary regional route once they are in the area. Improving the key challenges facing commercial truck drivers, which include congestion, truck restrictions, and connectivity will sustain and encourage future economic development that requires roads and amenities conducive to truck movements. In addition to the movement of trucks on I-270, the interstate also provides a vital link to other modes in the region including ports, rail, and aviation.

The study also analyzed the existing land use and business characteristics of the corridor. It is important to note that there are several commercial properties that appear to be underutilized or vacant and would, therefore, be poised for redevelopment opportunities. It is anticipated that roadway improvements along the corridor would improve traffic operations and access, which is essential to sustaining existing businesses and encouraging future economic development.

Alternative Analysis

After the team had analyzed existing conditions, it worked to develop preliminary concepts to address the identified problems and needs on the corridor. These preliminary concepts consisted of a wide range of ideas including:

- adding auxiliary lanes
- widening I-270
- removing/consolidating access to and from I-270
- relocating cross-over slip ramps
- managing access
- maintaining existing two-way outer roads
- creating a one-way outer road system
- improving several stand-alone interchanges

The study team engaged the CAG to further develop and refine the concepts to improve the I-270 North Corridor. The preliminary concepts were then screened, as part of the Tier I screening process, to develop a suite of alternatives to undergo more detailed analysis.

The preliminary alternatives screened for further analysis were then grouped into near-term and long-term concepts. Table ES-1 summarizes these near- and long-term concepts. The study team engaged both the CAG and the public to further develop and refine the concepts to improve the I-270 North Corridor.

Near-term concepts include: adding an auxiliary lane between Lindbergh and I-170, restriping westbound I-270 at Lindbergh to improve lane configuration, and modifications along McDonnell Blvd. These near-term concepts are recommended for implementation. In fact, restriping westbound I-270 west of Lindbergh to improve lane configuration has already been completed as part of the programmed Lindbergh project.

Long-term concepts include: widening I-270; a two-way outer road system; a one-way outer road system; and interchange reconfigurations at the Lindbergh and Route 367 interchanges. The following corridor improvement concepts are recommended for further analysis in an environmental study:

1. No-build or maintain the existing system
2. Outer roads remain two-way from McDonnell Blvd to Route 367
3. Outer roads are converted to one-way from McDonnell Blvd to Route 367

The Lindbergh and Missouri Route 367 interchange reconfigurations will be adapted either as stand-alone improvements or as part of the two above corridor-wide concepts.

Table ES-1: Near- and Long-Term Improvement Concepts

Near-Term Improvement Concepts	
Recommendations	Conceptual Estimate* (Millions)
Eastbound Auxiliary Lane between Lindbergh and I-170	\$0.850 M
Improve Lane Utilization on McDonnell Blvd	\$0.750 M
Long-Term Improvement Concepts	
Recommendations	Conceptual Estimate* (Millions)
Lindbergh Single Point Urban Interchange (SPUI) Only	\$25 M
Route 367 Single Point Urban Interchange (SPUI) Only	\$18 M
Widen and Rebuild I-270 in which the Outer Roads remain two-way, from McDonnell Blvd to MO 367 (Including Lindbergh & Route 367 Interchanges)	\$350M - \$385M
Widen & Rebuild I-270 in which the Outer Roads are Converted to One-Way, from McDonnell Blvd to Route 367 (Including the Lindbergh & Route 367 Interchanges)	\$320M - \$360 M

* Construction and Right-of-Way Costs, in Current Dollars.

1.0 Introduction and Background

The St. Louis District office (SLD) of the Missouri Department of Transportation (MoDOT), in cooperation with the East-West Gateway Council of Governments (EWG), the Metropolitan Planning Organization for the St. Louis region, has completed a corridor study of Interstate 270 (I-270) in North St. Louis County. This study examined the problems, needs, and opportunities of the I-270 corridor and identified possible solutions to address those problems and needs. These solutions are to be carried forward for more detailed environmental evaluation, in the near future, under the National Environmental Policy Act (NEPA) process. Further, this study has established planning and environmental linkages (PEL) such that any and all opportunities (where appropriate) to accelerate the environmental evaluation could be maximized. This chapter will:

- Present the study's background
- Describe the study area
- Identify and define the goals and objectives of the study

1.1 Background

In 2005, the Board of Directors of EWG adopted *Legacy 2030*, the long-range transportation plan for the St. Louis region. The plan recommended a study of the I-270 corridor in North St. Louis County. That policy body recognized several important factors and trends in making this recommendation: increasing traffic volumes and crashes contribute to operational and safety problems along the corridor; aging and outdated infrastructure; increasing need for public transportation service; and the growing and significant role I-270 plays in the movement of goods as well as for commuting to and from work. In addition, the parallel but discontinuous outer roadways and arterials comprise a vital link in the area's highway network, connecting several communities, myriad businesses, institutional centers, and recreational destinations in the North St. Louis County area. It should be noted that the movement of goods on the corridor has both regional and national significance.

A review of the literature shows that there have been a number of studies and plans developed by individual communities and other jurisdictions with some tangential connection to I-270. However, none have had a specific focus on the I-270 corridor. Among these studies are: *St. Louis County's Transportation Assessment of Ford Vicinity*; *St. Louis County's I-270/Highway 367 Corridor Study*; *MoDOT's I-270/I-70/MO 370 Traffic Simulation and Preliminary Alternatives Development*, and *EWG's Northside Major Transportation Investment Analysis (MTIA)*.

In March 2011, MoDOT initiated this planning effort to fully investigate the problems, needs, and opportunities of the I-270 corridor. Through a collaborative process that involved MoDOT, its planning partner, EWG, and with the support of Metro, St. Louis County, and North County

Incorporated (NCI), MoDOT conducted this study over a fifteen-month period. The work was directed by a study team whose membership included staff from MoDOT, EWG, Metro, and the St. Louis County Department of Highways and Traffic. The team was led by a MoDOT study manager.

1.2 Study Area Description

As was previously mentioned, the study area is located in North St. Louis County, where many of the older communities of the metropolitan area are located. It includes portions of five municipalities: Hazelwood, Florissant, Ferguson, Dellwood, and Bellefontaine Neighbors. Figure 1 on the following page depicts the regional context of the study area. The limits of the study area are: the I-270 mainline; parallel outer roadways (Dunn Road and Pershall Road); and connecting arterials, from just west of the I-270/McDonnell Blvd interchange to east of the I-270/Missouri Route 367 (Lewis and Clark Blvd) interchange. The length of the corridor is approximately 10 miles. In general, the corridor extends approximately 250 foot on both sides of the existing I-270 right-of-way. At each interchange location, the corridor is widened to encompass the involved interchange and outer roadway segments. Figure 2 on the following page shows the study area in detail.

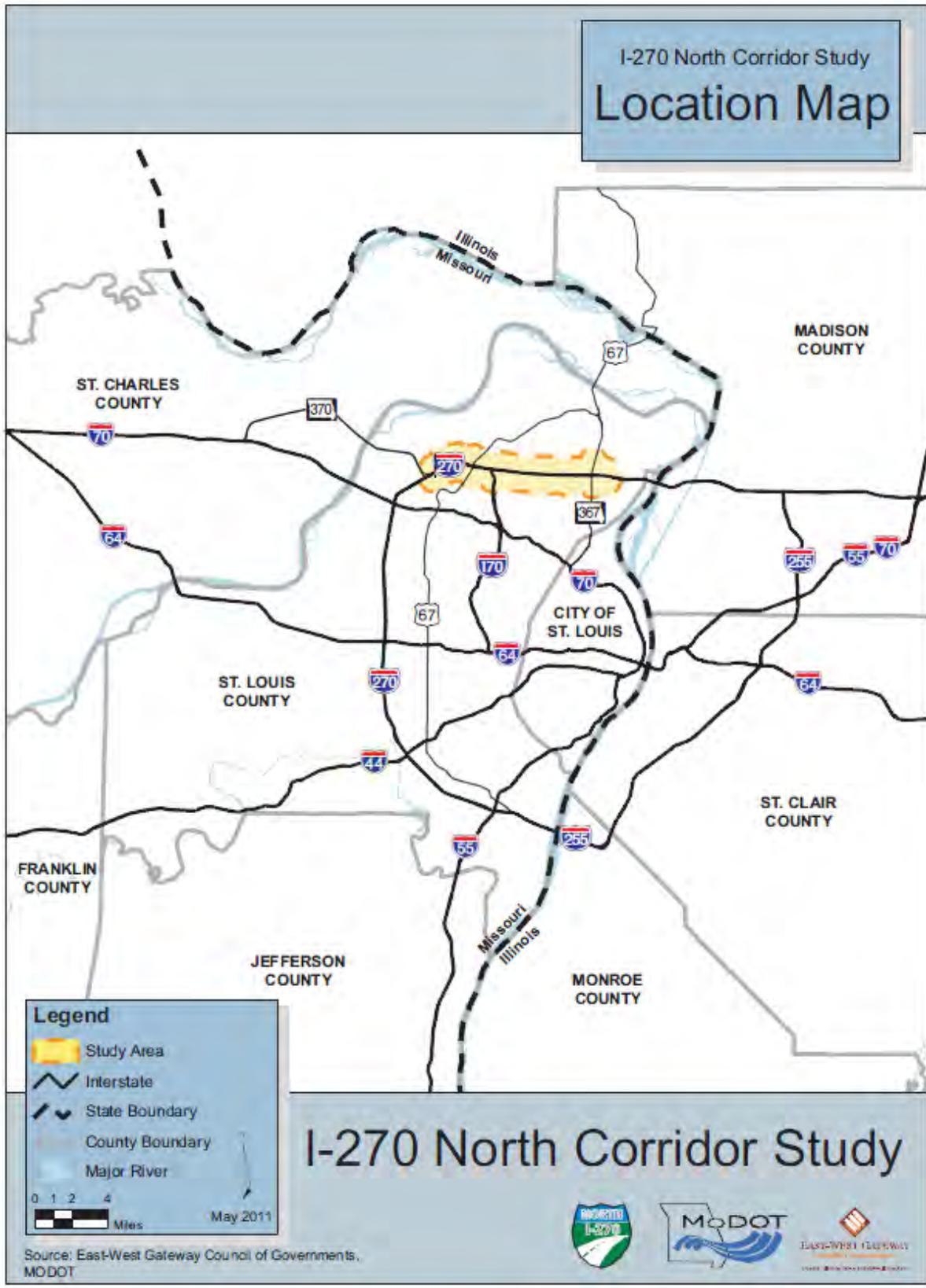
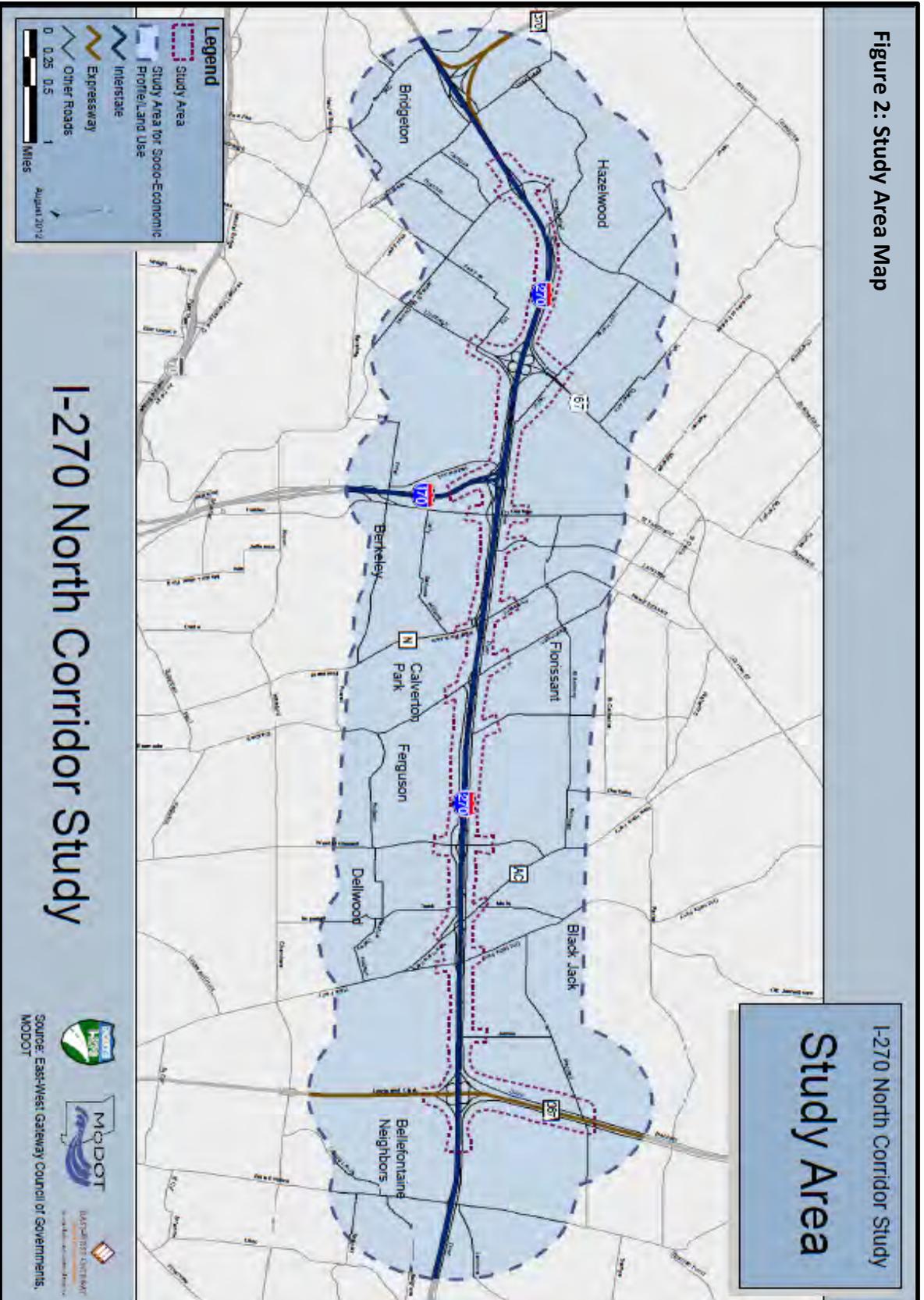


Figure 1: Location Map

Figure 2: Study Area Map



1.3 Goals and Objectives

In addition to a review of the literature, as discussed in the previous section, a key early step in the study process was the identification of the study area's transportation-related problems and needs. These are presented in Chapter 2, Existing Conditions. However, it was just as important to identify a set of guiding principles for this study. Thus, in late fall 2010, just before the formal start of the study, MoDOT facilitated a discussion with EWG, Metro, and others to brainstorm and formulate goals and objectives. These goals and objectives were based, in part, on what is known about the corridor, i.e. how it currently functions, accident locations, etc., as well as opportunities for enhancing its future viability. Based on that discussion, the refined goals and objectives are to:

1. Identify and define the transportation problems and needs along the I-270 North Corridor, focusing on a 10-mile section of the I-270 mainline and adjacent and connecting outer roads and arterials.
2. Develop system improvement solutions that are both practical and multimodal in scope, with emphasis placed on safety, capacity, and operational efficiency for all users of the I-270 North Corridor.
3. Enhance access opportunities and safety along the corridor for transit, bicycles, and pedestrians.
4. Recommend sets of both near- and long-term conceptual improvements for the corridor.
5. Partner with the communities of North County to implement sound transportation improvement solutions and strategies that enhance economic and community growth.

2.0 Existing Conditions

A comprehensive inventory was undertaken to document the condition of the network of roads and bridges, pedestrian and bicycle facilities, traffic operations, and safety in the study area. In addition, environmental and cultural resources along the corridor were identified and documented. The study team also reviewed post-construction evaluations of the traffic operations improvement measures, e.g. signs, raised medians, striping, etc., that have been installed on the outer roads in recent years. Equally as important, the team analyzed the socio-economic and demographic profiles (including the use of public transportation and the movement of goods) of the study area. The results of these analyses are discussed in the sections that follow. More detailed information on the existing conditions of the corridor is documented in Technical Memorandum A.

2.1 Roadway and Bridge Conditions

2.1.1 I-270 Mainline

Mainline I-270 is among the oldest sections of freeways in the St. Louis region. It was built in the 1960s as a four-lane divided interstate highway, not including auxiliary lanes, with most sections containing an outer roadway on one or both sides of the interstate. Growth along the corridor and a corresponding increase in traffic led to widening of the I-270 mainline to six lanes east and eight lanes west of Lindbergh Boulevard (US 67), not including auxiliary lanes. This was done by adding lanes in the median and installing a median barrier. The widening of I-270 resulted in ten-foot shoulders on the outside, but narrow five-foot inside shoulders on the left next to the barrier wall along much of the interstate within the study area. The only exception to this is the I-170 interchange which consists of full-width 12-foot inside and outside shoulders.

While MoDOT has maintained the roadway in good repair for more than 50 years now, increasing demands, coupled with age, will soon require the replacement of bridges and deteriorated roadway sections. The majority of the roadway east of Lindbergh, for example, consists of asphalt pavement over old and deteriorated concrete that is at the end of its useful life. Within the study area itself, there are 22 bridges and one culvert. Excluding the I-170 interchange, which was rebuilt in 2002, most of the other structures were built in the 1960s. Currently, seven of those structures are rated deficient while three others will be deficient within the next few years. Table 1 on the following page lists all of the structures on I-270 within the study area and identifies their current physical condition.

Table 1: Bridge and Culvert Conditions

Bridge No.	Route	Feature Intersected	Year Built	Rehab/ Repair Years	Length	Width (ft.)	Sufficiency	Structural Evaluation	Deficient
A0210	OR 270 E	COLDWATER CREEK	1960	1988/2010	119	28	80	6	No
A0212	ELIZABETH AVE S	IS 270	1960	1988/1999	152	52	59	4	No
A0222	WEST FLORISSANT	IS 270	1961	1987	201	78	90	6	No
A0223	IS 270 E	RT AC	1961	1996	229	44	71	5	FUNC.OBS
A0223	IS 270 W	RT AC	1961	1996	229	44	72	5	FUNC.OBS
A0226	US 67 S	IS 270, RP IS270W TO US67	1960	1990	287	36	30	2	STRUCT. OBS
A0226	US 67 N	IS 270, RP IS270W TO US67	1961	1990	287	36	43	2	STRUCT OBS
A0240	OLD HALLS FERRY RD	IS 270	1961	1988	130	52	66	5	No
A3808	IS 170 E	OR 270	1978	2007	250	24	88	6	FUNC OBS
A6350	JAMES S MCDONNELL	IS 270	2002		192	132	98	8	No
A6370	IS 170 W	IS 270, RP DUNN RD TO IS270	2002		1557	28	74	8	No
A6371	RP IS270W TO IS170	IS 270, OR 270, RP IS270	2002		1074	40	97	8	No
A6372	RP IS170W TO IS270	OR 270	2002		245	40	98	8	No
A6373	RP IS170W TO IS270	RP IS270E TO NORTH HANLEY RD	2002		258	40	98	7	No
A6411	IS 270 E	CST NORTH HANLEY RD	2002		231	75	89	8	No
A6412	IS 270 W	CST NORTH HANLEY RD	2002		232	75	89	8	No
J0847	IS 270 E	MO 367	1961	1973/1980/ 1996/2004	200	107	88	6	No
L0717	IS 270 E	COLDWATER CREEK	1960	1979/2000/ 2013	120	116.1	80	5	No
L0745	IS 270 E	RT N	1960	1996/2005/2013	205	41	57	5	STRUCT OBS
L0745	IS 270 W	RT N	1960	1996/2005/2013	205	41	59	5	STRUCT OBS
A0662	PED OVERPASS(E/O RT N)	IS 270	1960		270	N/A	-	-	No
A6413	PED OVERPASS (E/O 170)	IS 270	2002		204	N/A	-	-	No

Green Highlight indicates Major Bridge.

Orange Highlight indicates structures programmed for replacement/rehabilitation.

MoDOT Traffic Management System Database (completed in 2011).

There are ten interchanges within the study area. The spacing between interchanges ranges from 0.25 miles to 1.69 miles. According to MoDOT's Access Management Guidelines, interchange spacing in the study area does not meet the recommended minimum interchange of two miles in urban areas. Table 2 on the following page identifies the various interchange types within the study area and how the connecting roadways are classified.

Table 2: Interchange Type and Functional Classification

Cross Road	Interchange Type	Functional Classification
McDonnell Blvd	Traditional Full Diamond	Principal Arterial
Lindbergh (US 67)	Cloverleaf with westbound collector-distributor (C-D) to separate weaving traffic from mainline I-270	Principal Arterial
I-170	Fully directional interstate to interstate	Interstate
Hanley Rd/Graham Rd	Crossover slip ramps to Dunn Road for westbound, diamond ramps for eastbound	Principal Arterial
Route N (New Florissant Rd)	Crossover slip ramps to Dunn Road for westbound, diamond ramps for eastbound	Minor Arterial
Washington St./Elizabeth Ave.	Crossover slip ramps to Dunn Road for westbound exit, no westbound entrance, diamond ramps for eastbound	Minor Arterial north of I-270/ Collector South of I-270
West Florissant Ave.	Crossover slip ramps to Dunn Road for westbound, diamond ramps for eastbound	Principal Arterial
Route AC (New Halls Ferry Rd)	Crossover slip ramps to Dunn Road for westbound, split-diamond interchange with Old Halls Ferry Rd for eastbound	Principal Arterial
Old Halls Ferry Rd	Crossover slip ramps to Dunn Road for westbound exit, no westbound entrance, split-diamond interchange with Rte. AC (New Halls Ferry Rd) for eastbound	Minor Arterial
Route 367 (Lewis and Clark Blvd)	Traditional Cloverleaf	Freeway

In addition to close interchange spacing, most ramps to and from the interstate have inadequate acceleration and deceleration lanes. In some cases, these conditions are combined with inadequate weaving lengths on the interstate. For example, on westbound I-270, between New Halls Ferry Road (Route AC) and West Florissant Avenue, the weaving length is approximately 600 feet.

2.1.2 Dunn Road

Dunn Road is a continuous, two-way outer road that generally runs parallel to and on the north side of I-270, for the length of the study area. The majority of the westbound I-270 interchange movements in the study area east of I-170 occur at the two-way cross-over slip ramps to the Dunn Road. Due to the shallow angle of entry of the ramp to the outer road, it is sometimes difficult to see ramp traffic at the conflict points. Moreover, the close proximity of the cross-over slip ramps to various signalized intersections between Dunn Road and the arterials creates traffic operational and safety problems. Figure 3 on the following page illustrates the crossover situation that currently exists on Dunn Road.



I-270 Two-way slip off-ramp west of Old Halls Ferry Road



I-270 Two-way on-slip ramp west of New Halls Ferry Road

Figure 3: Cross-over Slip Ramps

2.1.3 Pershall Road

Pershall Road is a discontinuous two-way outer road, which generally parallels I-270 on the south side, between Lindbergh and Old Halls Ferry Road. There are three gaps along Pershall Road between McDonnell Blvd and Lindbergh; New Florissant Road (Route N) and Washington Street/Elizabeth Avenue; and Old Halls Ferry Road and Route 367. It is also important to note that Pershall Road between New Halls Ferry Road and Old Halls Ferry Road is one-way. Unlike Dunn Road, the two-way cross-over slip ramps do not exist on Pershall Road. Rather, traffic enters and exits the interstate by diamond ramps. The proximity of Pershall Road to these diamond ramps is a contributing factor to congestion and safety issues on the various arterials.

2.1.4 Access Management

The number of entrances and their close spacing on the outer roads (Dunn Road, in particular) raises safety concerns along these roads and the intersecting arterials. This is very evident at the outer road intersections of Hanley Road, New Florissant Road, Washington Street/Elizabeth Avenue, Old Halls Ferry Road and New Halls Ferry Road.

2.1.5 Pedestrian and Bicycle Facilities

Most of the existing pedestrian facilities within the study area do not meet requirements of the Americans with Disability Act of 1990 (ADA). In some locations sidewalks are discontinuous or do not exist. As a result, the study area lacks connectivity along and across I-270 for pedestrians. In particular, the cloverleaf interchanges at Lindbergh and Route 367 create

physical barriers for pedestrians and bicycles who may wish to travel beyond these interchanges. Figure 4 shows some of the existing pedestrian facilities within the study area.



Sidewalk at New Florissant Road that does not meet ADA standards



Discontinuous pedestrian path at West Florissant Avenue

Figure 4: Existing Pedestrian Facilities

2.2 Traffic Operations

A detailed capacity analysis was undertaken to determine the study area’s roadway operating conditions using SYNCHRO, VISSIM, and the Highway Capacity Software (HCS+) packages. These packages, used together, offer a powerful tool for analyzing traffic conditions on a complex road network, such as is found in the study area.

SYNCHRO and HCS+ analysis procedures are based upon the methodologies outlined in the “Highway Capacity Manual” (HCM), published by the Transportation Research Board (TRB) in 2000. The HCM, used universally by highway and traffic engineers to measure roadway capacity, establishes criteria for six Levels of Service (LOS): LOS A (“Free Flow”) through LOS F (“Breakdown Conditions”). SYNCHRO was used to evaluate the operating conditions at the signalized intersections in the study area. HCS+ was utilized to evaluate the merging, diverging, and basic freeway segments along mainline I-270. VISSIM is a micro-simulation model that was used to analyze complex transportation systems and to evaluate at-grade intersections and freeway operations.

Traffic volumes on I-270 range from 115,000 to 135,000 vehicles per day, with the highest volumes occurring between Hanley Road and New Florissant Road. Truck volumes in this section of I-270 represent approximately 17% of daily traffic volumes. Both volumes are projected to increase by approximately 25% by the year 2040. Thus, the present constraints to I-270 will contribute to worsened traffic conditions in the future. Not including auxiliary lanes, I-270 consists of four lanes, in each direction, from west of McDonnell Blvd to the Lindbergh interchange. The interstate then narrows to three lanes, in each direction, from the Lindbergh interchange to just east of Route 367. The loss of one lane at Lindbergh creates a bottleneck for eastbound vehicles, which causes major congestion, especially during the evening rush hour. Further adversely impacting the flow of traffic on I-270 are the ten closely spaced interchanges within the study area. In addition, the westbound weaving segment between New Halls Ferry Road and West Florissant Avenue is especially short with a distance of approximately 600 feet. Maneuvering to either enter or exit the interstate at this point requires very aggressive driving which impacts operations on the interstate. Figure 5 is an aerial of this weaving segment.



Figure 5: New Halls Ferry Road-West Florissant Avenue Weaving Segment

Typical congestion during the morning and evening rush hours can be described in this manner:

During the morning rush hour, the demand for I-270, eastbound and westbound, is approximately 5,000 and 7,000 vehicles, respectively. Typical queuing experienced by vehicles is due to the I-170/Hanley Road interaction with New Florissant Road; the proximity of and weaving between the I-170 and Lindbergh interchanges; and other weaving segments along the mainline travelling westbound. This results in shockwaves extending between I-170 and Route 367. The interstate operates at a Level of Service (LOS) E or F (during the morning rush hour) eastbound between Lindbergh and I-170, and westbound between West Florissant Avenue and Lindbergh, and at the northbound Route 367 off-ramp.

During the evening rush hour, the demand for I-270, eastbound and westbound, is approximately 6,000 and 5,500 vehicles, respectively. Typical queuing experienced by vehicles is due to the I-170/Hanley Road interaction with New Florissant Road, the proximity of I-170 with the Lindbergh interchange, and the weaving segments along the mainline travelling eastbound. The interstate typically breaks down from McDonnell Blvd to Washington Street/Elizabeth Avenue, and shockwaves extend between Route 370 and Route 367. During the evening rush hour, the interstate operates at a LOS of E or F eastbound, from Lindbergh to the I-170 off-ramp; from Hanley Road to New Halls Ferry Road; and at the Route 367 loop ramps. The interstate fails westbound with a LOS E or F at the northbound Route 367 off-ramp; the freeway segment west of West Florissant Avenue; and the weaving between I-170 and Lindbergh.

In summary, the following existing traffic issues have been identified in the study area:

- The basic freeway capacity along I-270 within the study area is constrained in the 6-lane section east of Lindbergh.
- High interchange density results in constrained merge diverge, and weaving segments along I-270 in the study area. Short weaving segments associated with heavy mainline and ramp volumes result in traffic flow breakdowns.
- Heavy traffic volumes at the I-170 interchange result in traffic constraints both to the east and the west of this interchange. Weaving segments operate at failing conditions between I-170 and Lindbergh to the west and between I-170 and New Florissant Road to the east.
- Cloverleaf interchanges and the associated weaving segments at Lindbergh and Route 367 interchanges cause traffic operational constraints. Proximity of the Lynn Haven Lane Road interchange and downstream signal capacity constraints further exacerbate conditions along Lindbergh.
- Cross-over slip-ramps providing westbound I-270 access create driver confusion, traffic operations, and safety constraints.
- Inadequate capacity and less than optimal lane configurations at several interchanges within the study area result in congested traffic operations.

2.2.1 Public Transportation

North St. Louis County consists primarily of suburban communities where residential neighborhoods of single-family homes and low-density apartment buildings are separated from auto-oriented commercial streets and strip malls. It is difficult to effectively serve this type of development pattern with transit, as potential customers often have to walk farther to access a bus stop, and vehicles must travel farther to pick up fewer riders. However, these communities are becoming increasingly more transit-dependent, especially as the population ages in place (currently 12% is over the age of 65). Many households in North St. Louis County do not own an

automobile (seven percent of households do not own a vehicle) or have less than one automobile per adult.

Over the last two years, Metro has invested in new routes and improved service frequency on several routes in North St. Louis County, and those markets continue to grow. During a typical month, 20% of MetroBus boarding's in Missouri occur on routes that primarily serve North St. Louis County. Table 3 shows the monthly ridership for the bus routes in the North St. Louis area.

Table 3: North County MetroBus Ridership

MetroBus Route	Monthly*	% of MO
74 Florissant	84,632	4.1%
61 Chambers	54,430	2.7%
35 Rock Road	51,726	2.5%
47 North Hanley	39,359	1.9%
36 Spanish Lake	38,606	1.9%
64 Lucas Hunt	35,735	1.7%
44 Hazelwood	24,587	1.2%
34 Earth City	19,475	1.0%
45 Ferguson	19,711	1.0%
75 Lilac-Hanley	13,984	0.7%
27 North County	10,207	0.5%
36X Bissell Hills	5,004	0.2%
174X Halls Ferry	4,745	0.2%
66 Clayton-Airport	2,509	0.1%
Total Share of MO MetroBus Ridership		20%
*Source data Metro, April 2011. April 2011 was chosen as a representative month for ridership activity because it is the first month showing stabilization in ridership since service restoration.		

2.2.2 Other Modes

The North I-270 corridor is used as both an outer loop for commercial vehicles using I-70 to move goods between eastern United States (US) and the western US and to move freight within the region. Based on a 2010 I-70 Corridor St. Louis Truck Origin-Destination Study, everyday approximately 62,000 commercial vehicles enter or exit the St. Louis area on major freeways. It is important to note, over 93% of all the commercial vehicles serving the St. Louis region reported using I-270 as a primary regional route once they are in the area.

2.3 Safety Analysis

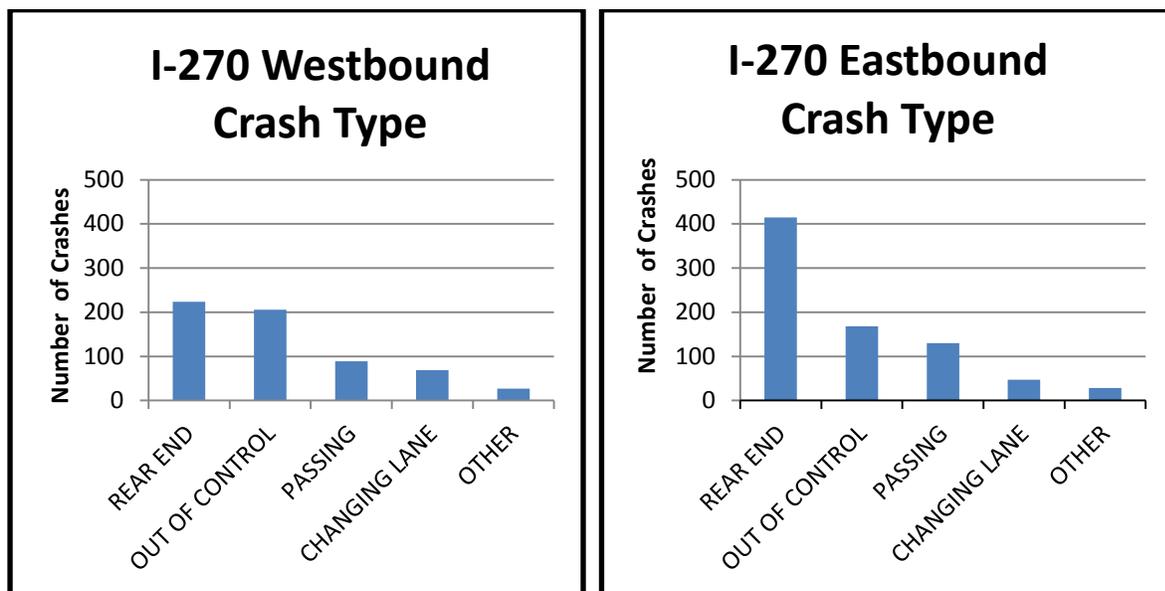
Crashes in the study area were examined for a three-year period, 2008-2010. Crash data compiled over this period shows 3,466 recorded crashes, of which there were 1,452 recorded crashes on I-270 mainline; 1,300 crashes recorded on the outer roads; and 714 crashes

recorded on cross streets and ramps. The results were analyzed by freeway mainline segments, interchanges, and outer roads. This section summary highlights only the worst safety issues for this corridor.

2.3.1 Mainline Segments

Similar to most two-mile segments of I-270 in the rest of St. Louis County, all two-mile segments within the study corridor are identified as severe segments based on the statewide high severity range criteria. The analysis of the mainline segments of I-270 identified 812 crashes eastbound and 640 crashes westbound. The majority of the mainline crashes throughout the corridor in both directions were rear end types, primarily due to periods of heavy congestion. In particular, the four segments with higher than statewide crash rates are:

- Eastbound: Lindbergh eastbound off-ramp to I-170 southbound off-ramp.
- Eastbound: New Florissant Road off-ramp to Washington Street/Elizabeth Avenue off-ramp.
- Eastbound: New Halls Ferry Road off-ramp to Route 367 north on-ramp.
- Westbound: Route 367 north off-ramp to Rte. AC (New Halls Ferry Road) off-ramp.



Source: MoDOT's Traffic Management System

Figure 6: I-270 Mainline Crashes by Type (2008-2010)

2.3.2 Interchange Segments

The highest percentage of crashes within an interchange limit is at two cloverleaf interchanges, Lindbergh and Route 367.

1. The Lindbergh interchange has a large number of rear end and out-of-control type crashes both on I-270 and Lindbergh, with many of the crashes on I-270 occurring at ramp weave areas. The nearby Lindbergh intersection with Lynn Haven Lane experiences high numbers of left turn, left-turn right angle, and right angle type crashes.
2. The Route 367 interchange has a large number of cloverleaf ramp crashes, with the eastbound I-270 to northbound Route 367 being the highest. There are numerous rear-end, passing, and changing lane type crashes occurring. In 2011, I-270 and the Route 367 ramps were micro-sealed to improve skid resistance. The improvements were done after the crash analysis and therefore an analysis of the impact of this treatment on safety has not been analyzed.

2.3.3 Outer Roads Segments

The Outer Road analysis showed the highest percentage of crashes occurred on the following segments:

1. Dunn Road, from Washington Street to West Florissant Avenue.
2. Pershall Road, from Elizabeth Avenue to New Halls Ferry Road.

Most of the crashes on these outer roads were rear end types approaching the intersections, followed by left turn and left-turn right angle type crashes.

In 2008, safety improvements such as increasing pavement markings, installing medians and signs were constructed along Dunn Road in the vicinity of the two-way cross-over slip ramps. A significant improvement has been the installation of the medians along Dunn Road prior to the on-ramps, which restrict motorists from accessing the interstate on-ramps from the opposing lane. Although there has not been a significant decrease in the number of crashes along Dunn Road, the crash severity rate has decreased.

2.4 Environmental Characteristics

The I-270 North Corridor is in a highly urbanized setting. As such, there is limited number of natural and cultural resources to be found. However, there are undeveloped areas, parks, and conservation areas that add green space to the corridor and enhance the quality of life for residents of the area.

As part of this study, the following resources were reviewed using available data to determine possible needs and concerns along the corridor: Floodplains, public lands, hazardous and solid waste, wetlands and stream, noise, air quality, cultural resources and historical preservation.

Further detailed analysis of these and all resources will be required in the NEPA stage, as well as mitigation opportunities for impacts. These possible needs or concerns include:

- The one-percent floodplain and/or regulatory floodway
- Several public lands sites with recreational components in the area, including Little Creek Nature Area, Bellefontaine Conservation Area, and Brookes Park
- The Coldwater Creek and St. Louis Airport Site (SLAPS) and other potential hazardous waste sites
- Probable noise impacts
- Coldwater Creek, a water of the US, and any necessary US Corps of Engineers (COE) permit
- Air quality conformity determination
- Impacts to the Myers House and barn and Gittemeyer House. A full cultural resources survey will be required.

2.5 Population, Income, Housing, and Employment Characteristics

For the purposes of this study (and to align where practicable with defined transportation analysis zones), a cordon area of approximately one mile on both sides of I-270, from McDonnell Blvd to Riverview Drive, was defined. A transportation analysis zone (or TAZ) is an area or unit of geography, based on US Census Block information, defined and used by East-West Gateway for travel demand modeling purposes.

According to the 2010 US Census, the study area has a population of approximately 78,000. Although the total population is declining, the non-white percentage of the population has increased since the previous Census and now comprises approximately 58 percent of the corridor’s total population. Table 4 below gives a profile of the corridor’s population change, by race and ethnicity.

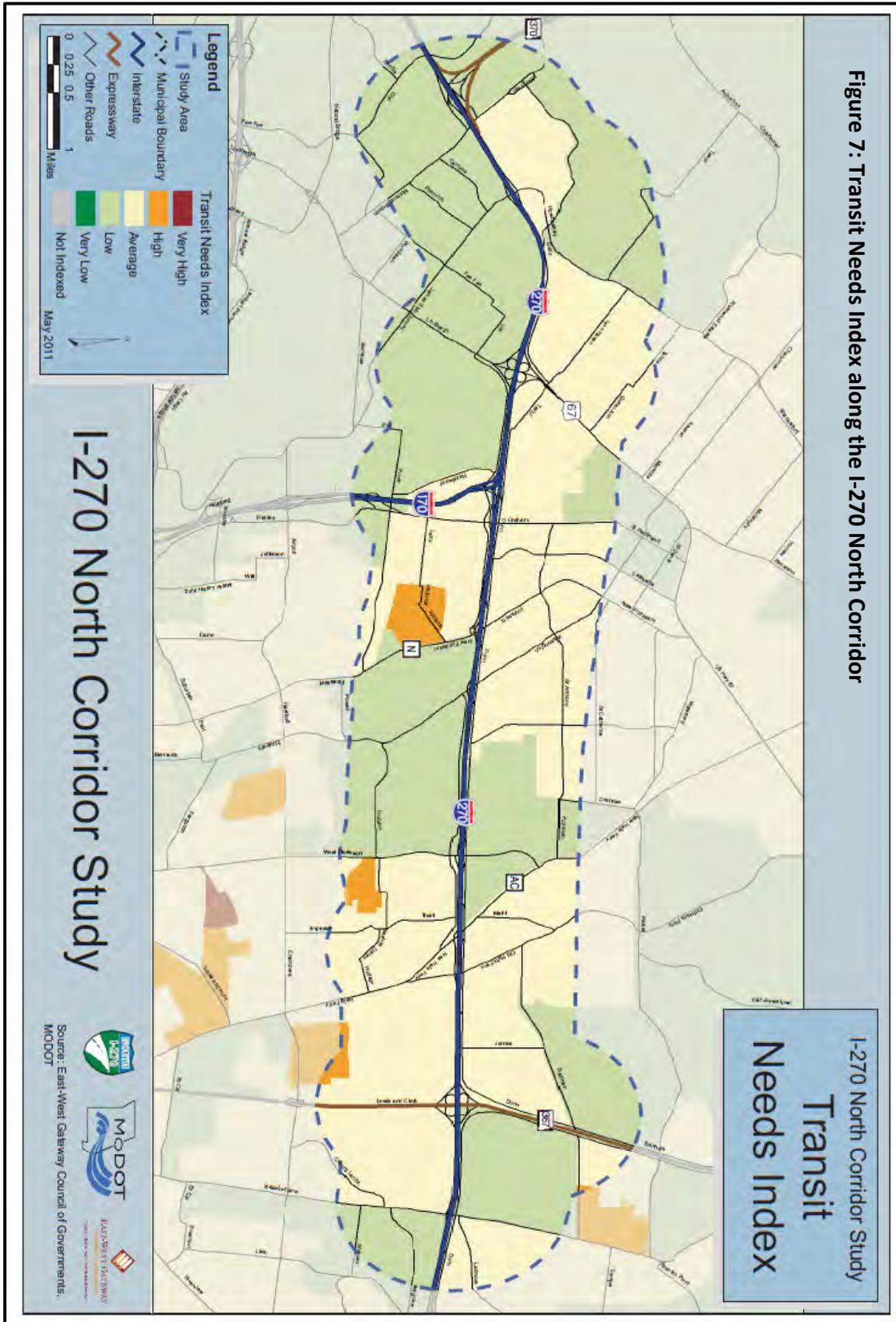
Table 4: Population Change, I-270 North Corridor, 2000 to 2010

	2000		2010		Percent Change
	Persons	Percent of Population	Persons	Percent of Population	
Population	85113		77834		-8.6
Non-Hispanic White	48625	57.1	32304	41.5	-33.6
Non-Hispanic Black	33475	39.3	41793	53.7	24.8
Non-Hispanic Asian	586	0.7	477	0.6	-18.6
Non-Hispanic Other	1451	1.7	1803	2.3	24.3
Hispanic	976	1.1	1457	1.9	49.3

Source: US Census, 2000 and 2010

The 2010 Census shows approximately 24% of the total population is less than 18 years old and 12% of the population is over the age of 65. Furthermore, nearly 19% of the individuals over the age of five are persons with disabilities. Of the persons living in the corridor, about one in six falls below the federal poverty threshold (about \$22,000 for a family of four) and over half of the households have annual incomes less than \$50,000. All of these variables are weighted to determine the Transit Needs Index (TNI), developed by Metro that rates Census tracts according to the level of need for transit. The index is used to place tracts in the following categories: very high need, high need, average need, low need, very low need. Figure 7 on the following page highlights the transit needs along the corridor. According to the Transit Needs Index, there are several areas of high need within or border the study area in the communities of Hazelwood, Calverton Park, Dellwood and Unincorporated St. Louis County.

Figure 7: Transit Needs Index along the I-270 North Corridor



There are approximately 33,000 households in the corridor. About two-thirds of the inhabited units in the corridor are owner –occupied, the remaining homes are occupied by renters. Home values vary throughout the study area but over 95 percent of the homes are valued at less than \$200,000.

A number of potential Environmental Justice (EJ) considerations have been identified along the corridor:

- The poverty rate in the corridor is about 16 percent.
- Persons over the age of 65 make up roughly 12 percent of the corridor’s population.
- Approximately 58 percent of the corridor’s population is classified as minority, and there is a fair amount of racial and ethnic diversity throughout the corridor.
- Approximately 7 percent of the households in the corridor do not have access to a vehicle.
- Approximately 19 percent of the corridor is made up of persons over the age of 5 with disabilities.

According to the Regional Commerce and Growth Association (RCGA), there are about 2,800 establishments located within the corridor. These firms employ approximately 30,000 workers in health care, social assistance, retail, and manufacturing – See Table 5 on the following page for Establishments by Industry in the study area. Although outside of the one-mile corridor, it is worth noting that Boeing employs approximately 10,000 employees just north of Lambert Airport.

Table 5: Establishments by Industry, 2010

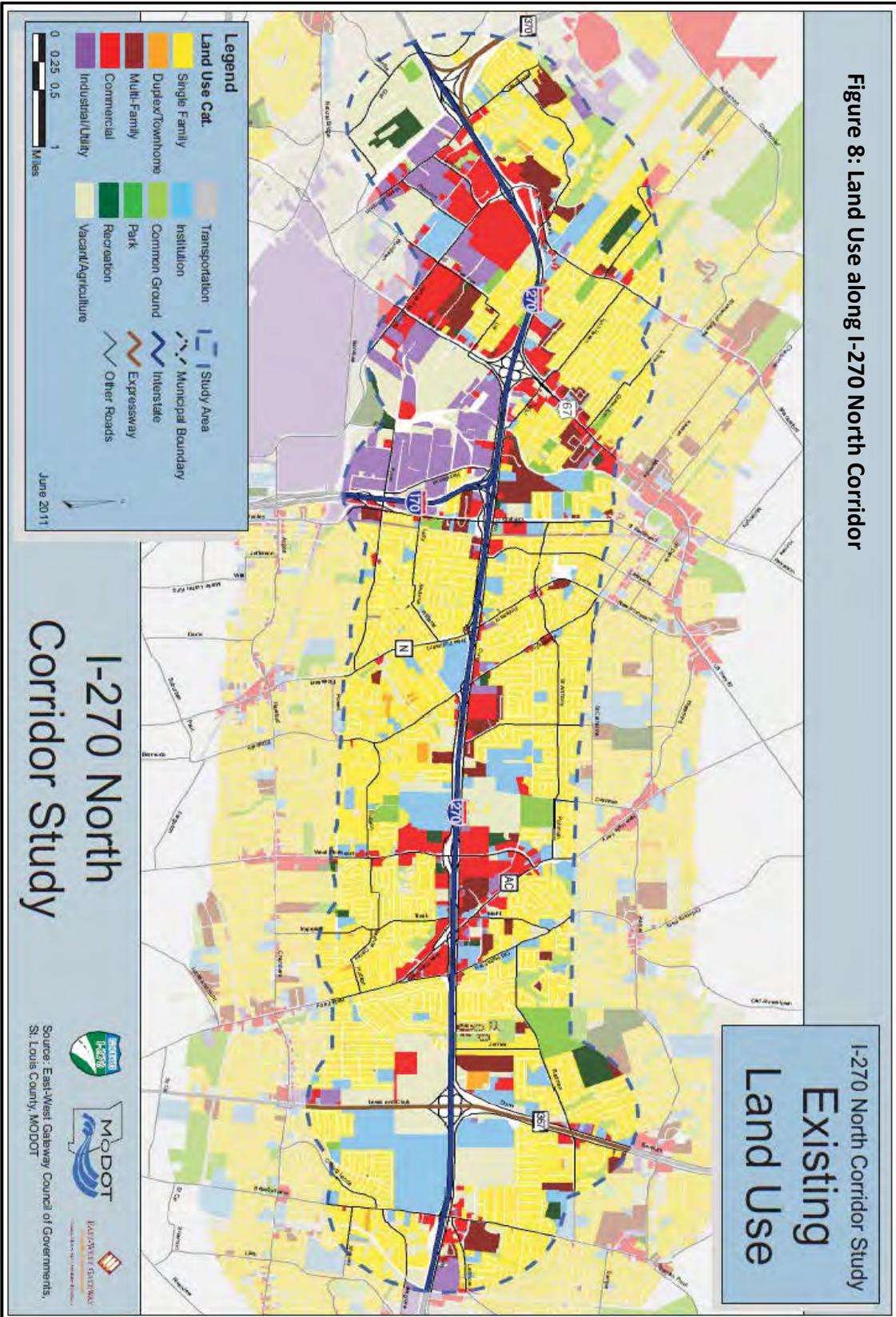
Industry	Firms		Employees	
	Number	Percent	Number	Percent
Agriculture	11	0.4	15	0.1
Construction	216	7.3	948	3.3
Manufacturing	102	3.4	3310	11.4
Wholesale	112	3.8	1443	5.0
Retail	320	10.7	4035	13.9
Transportation/Warehousing	102	3.4	1236	4.3
Information	45	1.5	179	0.6
Finance, Insurance, Real Estate	261	8.8	1264	4.3
Professional/Scientific/Tech Services	211	7.1	2942	10.1
Management of Companies	4	0.1	10	0.0
Administrative Support/Waste Mgt	228	7.7	928	3.2
Other Business Services	178	6.0	293	1.0
Education	58	1.9	2801	9.6
Health/Social Assistance	358	12.0	5231	18.0
Arts/Entertainment/Recreation	42	1.4	184	0.6
Accommodation	21	0.7	213	0.7
Food Services	124	4.2	1654	5.7
Other Services	381	12.8	1660	5.7
Public Administration	24	0.8	718	2.5
Source: Regional Commerce and Growth Association				

2.6 Land Use

Land use varies throughout the corridor, as shown in Figure 8 on the following page. It is important to note that along the corridor there are several commercial properties that appear to be underutilized or vacant and, therefore, would be poised for redevelopment opportunities. Specifically, along the corridor, from Washington Street/Elizabeth Avenue to Old Halls Ferry Road, there are several vacant or underutilized retail developments. While the recent recession has had an impact, most of the properties had been struggling for many years prior to 2008. While some of the cause may be economic, such as over building of retail, there is a general consensus that congestion on I-270, obsolete geometric design of the interchanges and ramps along with poor access to properties, have been contributors to the decline of vitality of the commercial properties along the corridor.

However, the story is not all bleak. There have been several new car dealerships built west of Lindbergh, and other developments have occurred as well. The largest new development is the National Personnel Records Center (National Archives and Record Administration), built on Dunn Road just east of the study area.

Figure 8: Land Use along I-270 North Corridor



3.0 Needs and Opportunities

As described in the previous section, the identification of the study area's transportation-related problems was intended to set a framework to further identify the transportation needs and opportunities for the study area.

3.1 Planned Improvements

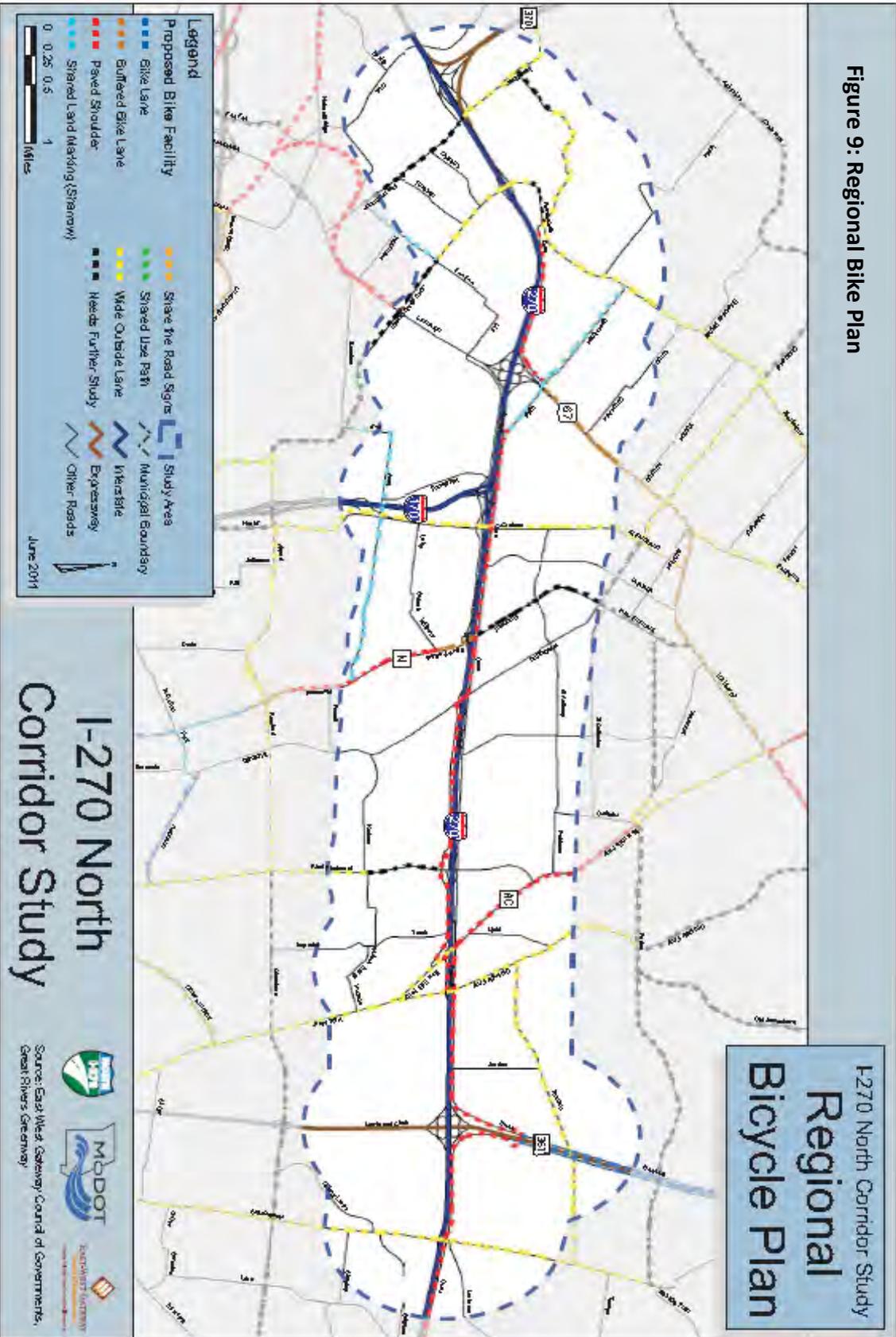
MoDOT has recently completed a number of improvement projects aimed at keeping the roadways and bridges in this area in good condition. Additional work has been planned for the next few years. Some of the recently completed or planned improvements within the study area are listed below:

- Rehabilitate the I-270 bridge over Coldwater Creek.
- Widen the southbound Lindbergh to westbound I-270 ramp.
- Reconfigure the eastbound I-270 exit to Lindbergh. The proposed improvements would eliminate the existing eastbound to northbound loop ramp and realign the existing eastbound to southbound ramp to provide a signalized left turn movement from the ramp onto northbound Lindbergh, thereby eliminating the weave on eastbound I-270.
- Replace the I-270 bridge over New Halls Ferry Road.
- Replace the I-270 bridge over New Florissant Road.
- Replace lighting facilities along I-270 from east of I-170 to Riverview Dr.
- Replace the existing Type A median barrier with Type C median barrier from New Florissant Road to New Halls Ferry Road.
- Rehabilitate Pershall Road bridge over Coldwater Creek.

3.2 Bicycle and Pedestrian Facilities

In 2011, Great Rivers Greenway completed *The Gateway Bike Plan* for the region. The Gateway Bike Plan provides a long-term vision for a connected system of on-road bicycle routes between communities, transit, greenways, and trails. The plan contains recommended improvements for a number of roads within the study area. Figure 9 on the following page highlights those recommendations.

Figure 9: Regional Bike Plan



3.3 Public Transportation and Access

According to Metro, the transit service in North St. Louis County has not been as effective as it could be. In 2000 and 2001, Metro adopted a new ‘hub-and-spoke’ strategy for planning a more effective multimodal transit system. This strategy emphasizes moving away from very long, winding, corridor-based bus routes to a system of shorter, neighborhood-serving collector routes converging on MetroLink Stations and MetroBus Transit Centers, where customers can then transfer to direct, high-frequency connections to regional employment centers and other high-demand destinations. Customers may need to transfer between routes, but overall travel time between origin and destination is often reduced. The ‘hub-and-spoke’ system also allows Metro to better match localized ridership markets with the most appropriate service level and vehicle type.

Although there currently is no facility in North County capable of serving as a major transfer hub for a strong and growing transit market, Metro is in the process of planning a new MetroBus Transit Center in North County. This facility is targeted for completion in summer 2013 and will act as a central transfer hub in the North County service area.

3.4 Other Modes

The St. Louis region has historically been a major player in national and international freight movements. While this study focuses on I-270 and the associated road network, the prominence of the other modes in the area, and the trans-loading needs of the other modes also add to the importance of the corridor. Interstate 270 provides a link between modes, access to the interstate system, a bypass route for the region, and access throughout the city for freight movement and final destination deliveries.

St. Louis is ranked as the third largest rail hub in the country. The Mississippi Riverfront at St. Louis is also the third largest inland port in the US. In aviation, efforts continue to establish regularly scheduled international air cargo services out of Lambert International Airport. As part of the seventh largest highway system in the country, St. Louis acts as a bridge between west and east coast economic activity. Interstate 270 plays a significant role in supporting regional freight movements as well as economic activity and development.

On the designated freight network, which includes the interstate highway system, the minimum design criteria is for trucks 8.5-foot wide, 14-foot high, 73.5-feet long, and weighing no more than 80,000 pounds. Any portion of I-270 restricted lower than these criteria will impede the efficient movement of the most common freight truck. Since I-270 also carries over-sized over-weight (OSOW) loads moving within the region or across the country, strong consideration should be made to accommodate trucks 16 foot wide, 16 foot high, and 150 feet long on the mainline road.

In addition to the mainline considerations, the interchanges and routes to businesses within one mile of I-270 should take the width, height, length, and weight restrictions into consideration. Not every interchange in this corridor needs to be designed for the 16-foot wide x 16-foot high x 150-foot long vehicles but the interstate corridor should be evaluated to determine which interchanges need to be designed to accommodate the OSOW loads. Designing interchanges for the semi-trailers with a 67 feet wheelbase will accommodate most freight into residential and light business areas while those leading to industrial zones should be reviewed in light of the larger vehicles.

4.0 Preliminary Alternatives Development and Screening

As described in the earlier sections of this report, aging infrastructure, limited basic freeway capacity, closely-spaced interchanges, heavy traffic volumes at the I-170 interchange, cloverleaf interchanges with short weaving segments, and two-way cross-over slip ramps are significant constraints along this section of the I-270 corridor. Given these existing problems, and based on the projected increase in traffic volumes from traffic forecasts, preliminary concepts were developed to address the needs of the corridor. More detailed information on the alternative development process and Tier I screening criteria are documented in Technical Memorandum B, Alternative Analysis.

4.1 No-Build Alternative

The no-build condition (the existing facilities and any programmed improvements) was included in the alternatives development and screening process to set a base-line condition. Traffic forecasts for 2040 were generated based on analysis of population and traffic growth trends in the region, outputs from the East-West Gateway Council of Governments Regional Travel Demand Model, and analysis of land use changes in the study area.

As shown in the traffic operational analysis, the existing network presents significant capacity constraints. Additionally, the increased traffic projections for 2040 worsen traffic operational constraints identified for existing conditions. By 2040, several freeway segments east of Lindbergh will operate at or over capacity, resulting in worsening breakdowns in traffic flow.

4.2 Transportation System Management

Several Transportation System Management (TSM) strategies were considered during preliminary concept development to provide enhanced traffic flow and improve safety. These included signal timing optimization, access management, and system-wide measures like ramp metering. Some of the strategies, such as signal timing optimization, have already been implemented. Moreover, it is recognized that because of the corridor-wide constraints, TSM strategies such as ramp metering alone are not anticipated to adequately address the needs of the corridor. Additionally, implementation of ramp metering is deemed not practical with the existing ramp configurations, e.g. spacing and geometry.

4.3 Preliminary Improvement Concepts

Several preliminary concepts were developed by the study team with input from the Community Advisory Group at alternatives development workshops. These alternatives consisted of a wide range of concepts grouped into sets of near-term (0-5 years), mid-term (5-15 years), and long-term (15-30 years) preliminary concepts.

4.3.1 Preliminary Concepts – Near-term

The near-term preliminary concepts provide small, localized solutions that improve operations for several years. They require no new right-of-way. The near-term preliminary concepts include:

- adding an auxiliary lane on EB I-270 between Lindbergh and I-170
- restriping westbound I-270 to add lane for Lindbergh on-ramp
- removing ramps
- improving lane utilization at McDonnell Blvd Interchange
- converting McDonnell Blvd to a Directional Diverging Interchange (DDI)
- removing or limiting access at Candle Light on Lindbergh
- optimizing lane configurations at various interchanges

4.3.2 Preliminary Concepts – Mid-term

The mid-term preliminary concepts provide medium-sized but still localized operational improvements along the corridor. They require minimal right of way. The mid-term preliminary concepts include:

- maintaining two-way Dunn Road by installing roundabouts at existing two-way slip ramps
- maintaining two-way Dunn Road with offset intersections at existing two-way cross-over slip ramps
- creating one-way outer road system between Hanley Road and New Halls Ferry Road (with possible phasing options)
- increasing transit / non-motorized travel options
- retrofitting Lindbergh interchange to DDI
- converting the west legs of Lindbergh Ramps/ Dunn Road/ Lynn Haven Lane / Taylor Road to a roundabout
- converting Lynn Haven Lane/Taylor Road to an at-grade intersection at Lindbergh
- relocating two-way cross-over slip ramps on Dunn Road

4.3.3 Preliminary Concepts – Long-term

The long-term preliminary concepts provide long-term (forecasted 2040 travel demand) system wide solutions to improve traffic operations along the corridor. They will require additional right-of-way and, in some cases, significant takings. The long-term preliminary concepts include:

- widening of I-270
- removing Old Halls Ferry Road interchange and consolidating with New Halls Ferry Road
- maintaining two-way Dunn Road / Pershall Road with either roundabouts or braided cross-over ramps at two-way cross-over slip ramps

- maintaining two-way Dunn Road by relocating Dunn Road to the north
- creating one-way outer road system beyond Route 367 to the Mississippi River
- creating one-way outer road system with a new overpass between Washington Street/ Elizabeth Avenue and West Florissant Avenue
- constructing a DDI, SPUI, or partial directional interchange at Lindbergh and relocating the Dunn Road
- relocating Dunn Road to Elm Grove
- creating a direct connection between Dunn Road/Pershall Road and the I-170 interchange
- improving connection between Lindbergh and I-170
- constructing a DDI, SPUI, Diamond, or Partial directional interchange at Route 367

4.4 Preliminary Alternatives Screening Process and Methodology

The study team established two levels of screening to derive sets of feasible or practical alternatives that would warrant more detailed analysis. Tier I screening consisted of a set of both subjective and objective measures while the measures used in the Tier II Screening were more objective or quantitative in scope.

First, the preliminary concepts were screened based on Tier I screening criteria to develop alternatives for further analysis. Several criteria were considered during the Tier I screening process including: safety performance, traffic operations, vehicular access, influence on transit, pedestrians and bicycles, economic and community growth, and practicality. During the Tier I screening process, the alternatives were grouped into near-term, mid-term and long-term alternatives. Secondly, preliminary concepts that were deemed not practical or not addressing the study goals and objectives are excluded from further analysis. It is important to note that all mid-term alternatives do not meet the study goals and objectives. As a result, going forward, the timeframe for near-term concepts is 0-10 years and for long-term concepts is 10-30 years. Those concepts that passed the Tier I screening process were further evaluated as described in Section 5.0 of this report.

5.0 Alternatives Analysis

As described in the preceding section, various preliminary concepts were developed and screened to generate a suite of alternatives for further analysis. The alternatives were grouped into near-term and long-term concepts. Near-term concepts are anticipated to address localized capacity constraints and long-term concepts are intended to provide capacity for 2040 forecasted travel demand. These concepts were analyzed further by the study team and with input from the Community Advisory Group at the second alternatives development workshop. The study team then proceeded with the Tier II screening that determines the recommended concepts to move forward to the Environmental Study. The Tier II screening criteria were more quantitative in nature. More detailed information on the alternative development and Tier II screening criteria is documented in Technical Memorandum B, Alternative Analysis.

The following section of this report describes the alternatives included in the final alternatives analysis.

5.1 No-Build

The no-build condition, representing existing facilities and any programmed improvements, was included in the alternatives development and screening process to set a baseline condition.

5.2 Near- Term Improvement Concepts

The near-term alternatives developed include localized stand-alone improvements targeted at providing immediate traffic operational benefits. See Appendix B for the near-term alternative sketches.

5.2.1 Auxiliary lane on eastbound I-270 between Lindbergh and I-170

This alternative would construct an additional lane between Lindbergh and I-170 to operate as an auxiliary lane between the interchanges along eastbound I-270. As mentioned earlier, the programmed improvement at I-270 / Lindbergh interchange (removing the existing eastbound I-270 to northbound Lindbergh cloverleaf loop ramp) would make it possible to extend the acceleration lane from the southbound Lindbergh to eastbound I-270 on-ramp and to provide a continuous auxiliary lane between Lindbergh and I-170. See Figure 10 on the following page.

Even though this improvement is a localized, stand-alone improvement—and is not a long-term solution—traffic operational analysis shows immediate benefits from this improvement by decreasing the weaving maneuvers (number of necessary lane changes between the two interchanges) and therefore improving freeway lane utilization. Moreover, preliminary analysis shows that the added lane can be accommodated over the Coldwater Creek Bridge without additional widening of the bridge, and that this alternative can be constructed at relatively low cost. Traffic operational analysis shows that this alternative provides acceptable traffic operations, LOS D or better, for 2025 travel demand. However, this alternative would operate

at or over capacity by 2040 traffic forecasts, necessitating a long-term corridor-wide improvement.



Figure 10: Auxiliary Lane on Eastbound I-270

5.2.2 Restripe westbound I-270 to add lane for Lindbergh on-ramp

Using existing pavement, a travel lane has been added along westbound I-270 past Lindbergh next to the median by restriping the pavement. It was recommended that this additional lane be added on the outside travel lanes instead of the inside travel lanes, in the area shown in Figure 11 on the following page. This would enable the on-ramp from Lindbergh onto westbound I-270 to have a continuous lane on I-270, instead of a short merging segment as existing. Traffic operational analysis shows that this alternative improves traffic flow in this section of the I-270 North Corridor and provides acceptable traffic operations (LOS D or better) for forecasted 2040 travel demand. Moreover, preliminary analysis shows that this alternative is relatively inexpensive to implement. This has been completed as part of the improvements at the Lindbergh interchange.

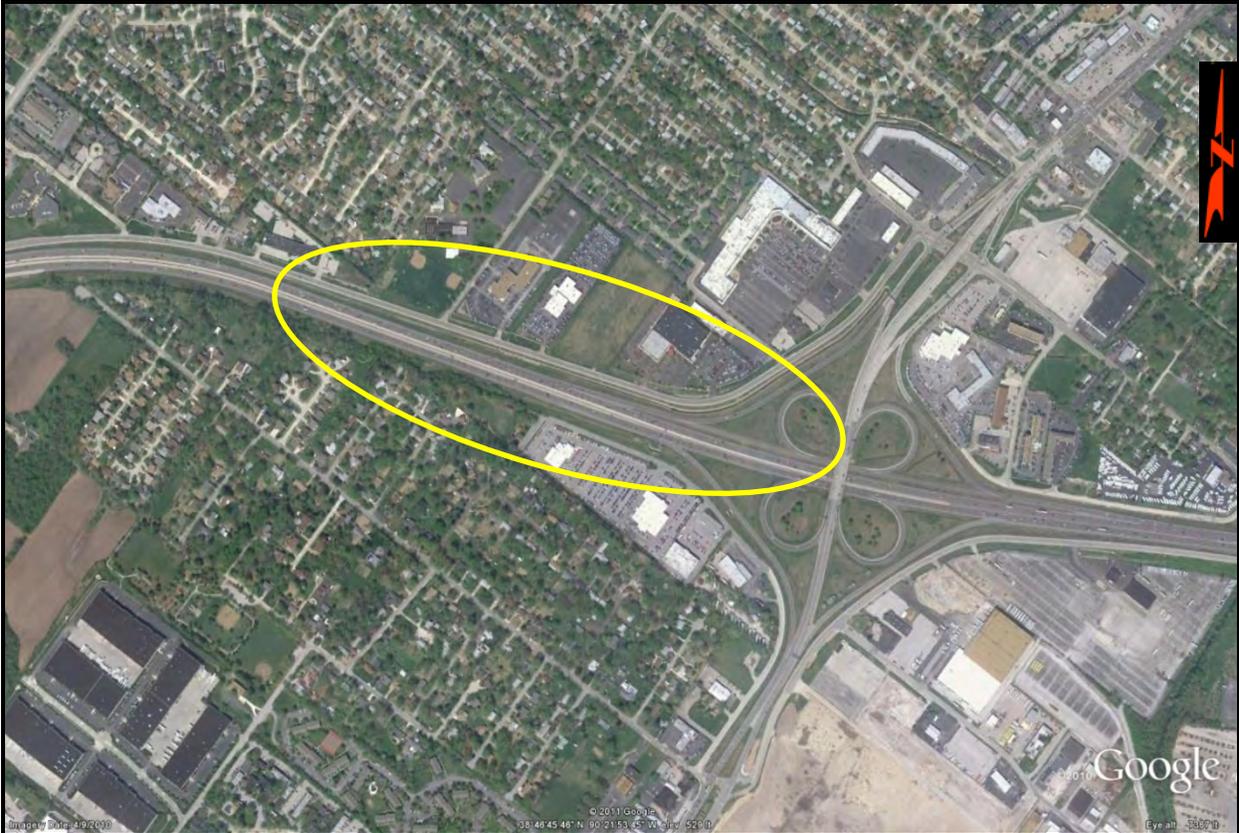


Figure 11: Restripe Westbound I-270 to Enhance Lane Configuration

5.2.3 McDonnell Blvd Interchange – Improve Lane Utilization

The goal of this alternative is to address the capacity constraints and poor lane utilization at the McDonnell Blvd interchange. The existing eastbound I-270 off-ramp at the McDonnell Blvd interchange is configured with three left-turn lanes at the interchange ramp terminal. However, field observations indicate poor utilization of the outside left-turn lane. Regular users of this intersection are aware that the third left lane ends at Brown Road, thus compelling drivers to avoid the outside left-turn lane at the ramp terminal.

A previous study completed in 2005 recommended that this third lane be extended past Dunn Road to provide better lane utilization at the interchange. See Figure 12 on the following page. This study has concluded that the earlier recommendation remains valid. Further, this improvement can be achieved with minimal pavement widening because of the existence of a third northbound lane already along McDonnell Blvd. Preliminary analysis shows that this improvement can be accomplished with minimal modifications to the Brown Road intersection along McDonnell Blvd. As such, this improvement is a relatively low-cost, short-term improvement that can be implemented to provide enhanced capacity at the interchange.

Traffic operational analysis also shows that this improvement and the anticipated better lane utilization at the interchange would provide enhanced capacity to handle 2040 traffic forecasts and would provide acceptable traffic operations. However, this study also recognizes that additional interchange improvements may be warranted if changes in land-use result in higher travel demands. In that scenario, preliminary analysis and past studies show that a Diverging Diamond Interchange (DDI) would provide enhanced capacity and improved traffic operations at the interchange.



Figure 12: McDonnell Blvd / Brown Intersection

5.3 Long-Term Improvement Concepts

The long-term alternatives developed include corridor-wide improvements and major interchange reconstructions. As stated earlier, the long-term alternatives are intended to provide adequate capacity for 2040 travel demands.

5.3.1 Widen I-270 Mainline

This alternative would reconstruct and widen I-270 between Lindbergh and Route 367 to provide four basic travel lanes in each direction along the I-270 corridor. In its existing configuration, each direction of I-270 has four through travel lanes west of Lindbergh, three through travel lanes between Lindbergh and Lilac Avenue and two through travel lanes east of Lilac Avenue over the Mississippi River Bridge.

Travel demands and existing travel patterns indicate a need for four through lanes west Route 367 and three through lanes east of Route 367 into Illinois. This alternative includes widening the I-270 corridor to be able to provide that added mainline freeway capacity. The recommended widening would provide four through travel lanes to the Route 367 interchange and three through travel lanes east of Route 367 into Illinois. This would include planned widening of the Chain of Rocks Bridge to three lanes in each direction as has been discussed by the Illinois Department of Transportation.

Even though this alternative enhances the available freeway capacity, it does not address freeway weaving resulting from closely-spaced interchanges. Traffic operational analysis for forecasted 2040 traffic demands indicates several segments along the I-270 corridor operating at failing conditions, LOS E or F. Moreover, this alternative does not address safety constraints from the two-way cross-over slip ramps on Dunn Road or capacity constraints on cross-streets. Preliminary analysis shows that this alternative has a high construction cost and would require additional analysis to determine the need for noise mitigation.

5.3.2 Two-way Outer Road System (Dunn Road / Pershall Road)

The emphasis of this alternative is to maintain existing outer roads, Dunn Road and Pershall Road, in their existing two-way configuration while eliminating the existing two-way cross-over slip ramps along westbound I-270. Several concepts were developed during the preliminary development stage to address the existing constraints along the corridor while continuing to maintain Dunn Road and Pershall Road as two-way roadways.

One of the concepts developed for the two-way system is to relocate Dunn Road north of its existing alignment. This would facilitate construction of standard ramps at the interchanges and thus eliminate the existing two-way cross-over slip ramps. However, Tier I screening has concluded that this concept would result in severe impacts to existing residences and businesses along the corridor and also would be associated with high construction cost and right-of-way impacts. As such, this concept was not included for further analysis.

Another concept developed for the two-way outer road system, and included in this alternatives analysis, is to maintain Dunn Road and Pershall Road in their existing configurations and eliminate the two-way cross-over slip ramps. Preliminary concepts developed to achieve this included construction of roundabouts at intersections of the ramps with Dunn Road, off-set interchanges, and construction of braided (grade-separated) ramps to eliminate the at-grade two-way crossing.

This alternative was developed using a combination of the roundabout and braided ramps to generate an overall corridor-wide improvement option between I-170 and Route 367. The segment of the alternative is illustrated in Figure 13 on the following page. It is important to

note that from a traffic operations standpoint; this concept does not address weaving issues along eastbound I-270. Additionally, this alternative would include widening along I-270 to four lanes – in segments where needed and geometrically feasible. Conceptual layouts and preliminary cost estimates assume that cross-streets would be widened to provide additional capacity as needed and geometrically feasible.

Since this alternative maintains Dunn Road and Pershall Road in their existing configurations, no adverse travel would be introduced. Preliminary traffic operational analysis of this concept shows that it would provide minimal improvements to traffic flow along westbound I-270. However, this alternative does not fully address the constraints resulting from closely spaced interchanges. As a result, freeway segments, particularly along eastbound I-270 would operate at failing conditions, LOS E or F, by 2040. Moreover, this alternative does not address interchange operational and geometric deficiencies. Preliminary analysis shows that this alternative would require significant additional right-of-way acquisition.

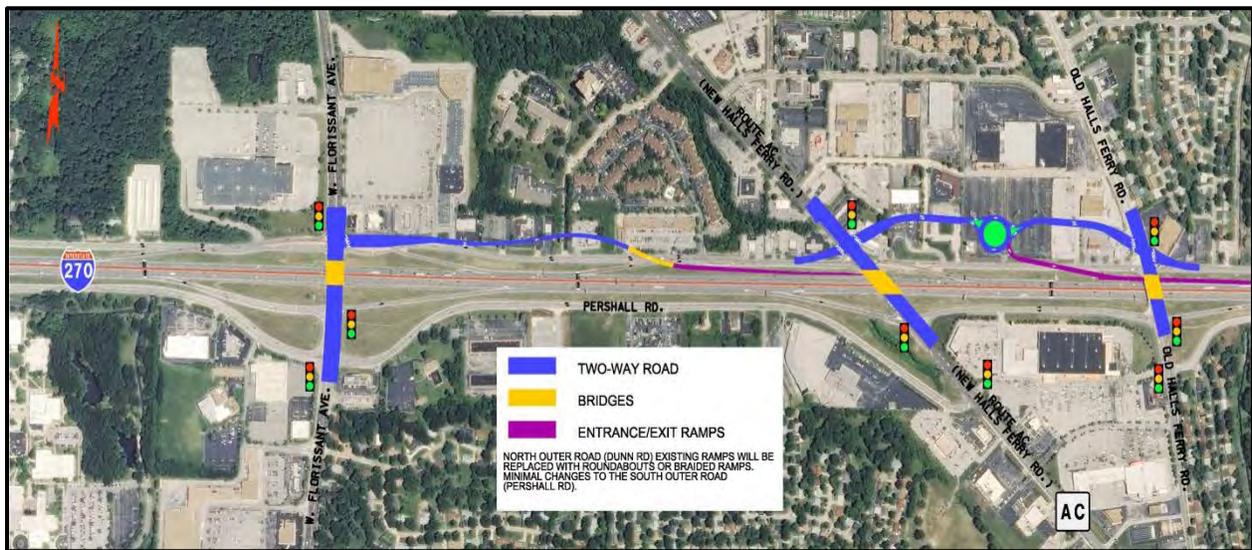


Figure 13: I-270 Segment showing Two-way Outer Roads

The two-way system corridor-wide improvement concept can be found in Appendix C.

5.3.3 One-way Outer Road System

The one-way outer road system alternative converts Dunn Road to one-way westbound and Pershall Road to one-way eastbound. Access to and from I-270 is provided via slip-ramps, as shown in Figure 14 on the following page.



Figure 14: I-270 Segment showing One-way Outer Roads

As described earlier, some of the system-wide constraints identified along the I-270 corridor within the study area include lack of freeway capacity, constrained weaving segments resulting from closely spaced interchanges, and two-way cross-over slip ramps along westbound I-270. The one-way outer road system is targeted towards largely addressing these identified constraints.

The emphasis of this one-way outer road system alternative is to enhance traffic operations along mainline I-270 as well as improve interchange traffic operations. This alternative would include an eastbound outer road south of I-270 and a westbound outer road north of I-270, between McDonnell Blvd and Route 367. The south outer road would largely follow the existing Pershall Road alignment and the north outer road would largely follow the existing Dunn Road alignment. Access between I-270 and the cross-streets is provided via slip-ramps to the outer roads. These proposed slip-ramps on a one-way outer road result in eliminating the existing two-way cross-over slip ramps on Dunn Road. Due to the conceptual nature of this study, slip-ramp configurations and locations are deemed preliminary and additional environmental and design studies would be required to finalize this alternative. However, to be able to achieve improved traffic flow, it is anticipated that access consolidation would be included with the slip-ramp configurations.

The one-way outer road system would also include improvements at interchanges, while maintaining the traditional diamond configuration in many cases. Changing a two-way road to a one-way road changes four-way intersections to three-way intersections. This would allow signals on the one-way segments of Dunn and Pershall Roads to operate more efficiently. In most cases, the number of signalized intersections at the interchanges is reduced since the ramps would end on the outer roads rather than the cross-streets. Additionally, this alternative would include widening I-270 to four lanes, based on capacity needs and geometric feasibility.

Conceptual layouts and preliminary cost estimates assume that cross-streets would be widened to provide additional capacity as needed and geometrically feasible.

This alternative is anticipated to improve overall safety along the corridor by eliminating the two-way cross-over slip ramps and bottlenecks. Preliminary traffic operational analysis shows that the one-way outer road system alternative would provide adequate mainline capacity and acceptable operations, LOS D or better, for 2040 forecasted travel demand. Additionally, as described earlier, reconfiguration of interchanges would result in improved interchange LOS. Preliminary geometric layouts show minimal additional right-of-way acquisition for this alternative.

With the conversion of Dunn Road and Pershall Road to one-way roadways, it is recognized that this alternative would result in adverse travel to some portions of the commuting public. The intended benefits from the one-way system operations are likely to outweigh the impacts from the adverse travel. Additionally to help minimize adverse travel, this alternative includes two additional overpasses: between Washington Street/Elizabeth Avenue and West Florissant Avenue, and between McDonnell Blvd and Lindbergh. Also in order to minimize travel times, u-turn ramps will be provided, as needed and geometrically feasible, at interchanges to facilitate efficient u-turn movements and enhance the available capacity at the interchanges. The need for u-turn ramps at interchanges will be evaluated during final design studies.

The one-way system corridor-wide improvement concept can be found in Appendix D.

5.3.4 Lindbergh Interchange Reconfiguration (including Lynn Haven Lane/Taylor Road / Dunn Road)

Several interchange reconfiguration alternatives were considered to improve the Lindbergh interchanges with I-270 and Lynn Haven Lane / Taylor Road/Dunn Road. One challenging aspect of the Lindbergh/I-270 interchange is the close proximity of Lynn Haven Lane/Taylor Road/Dunn Road to the north (on Lindbergh) and I-170 to the east (along I-270). The alternatives considered as part of this study maintained full access to Lynn Haven Lane/Taylor Road/Dunn Road from Lindbergh; however, this study also recognizes that this limited the range of feasible alternatives for improving the interchange.

Preliminary analysis shows that a Single Point Urban Interchange (SPUI) at Lindbergh / I-270 interchange with relocated Dunn Road and jug-handle connections to Lynn Haven Lane / Taylor Road would improve traffic operations and safety. As shown in Figure 15 on the following page. The focus of this alternative is to improve safety by eliminating the cloverleaf interchange and the associated weaving movements and also to eliminate the need for north Lindbergh traffic to travel through the Lynn Haven Lane intersection to access I-270. This alternative will provide acceptable traffic operations, LOS D or better, for forecasted 2040 travel demands.

Furthermore, this interchange configuration is largely compatible with either the two-way or one-way outer road configurations.

While it is anticipated that this interchange improvement concept is compatible with the one-way system, it should be noted that further engineering and traffic modeling would be required to determine if Lynn Haven Lane/Taylor Road remains grade separated or is converted to an at-grade intersection with Lindbergh. In addition, further analysis of all traffic movements at the Lynn Haven Lane/Taylor Road intersection needs to be evaluated and prioritized as it relates to the overall I-270 improvement concept, with either two-way or one-way outer roads, during the environmental study.

Additionally, flyover directional ramps were also considered. Preliminary analysis shows geometric challenges associated with the addition of directional ramps, specifically if full access remains at Lynn Haven Lane/Taylor Road. The benefits of flyover directional ramps versus full access to Lynn Haven Lane/Taylor Road need to be analyzed during the environmental study. This alternative is recommended to be explored further during the environmental study.

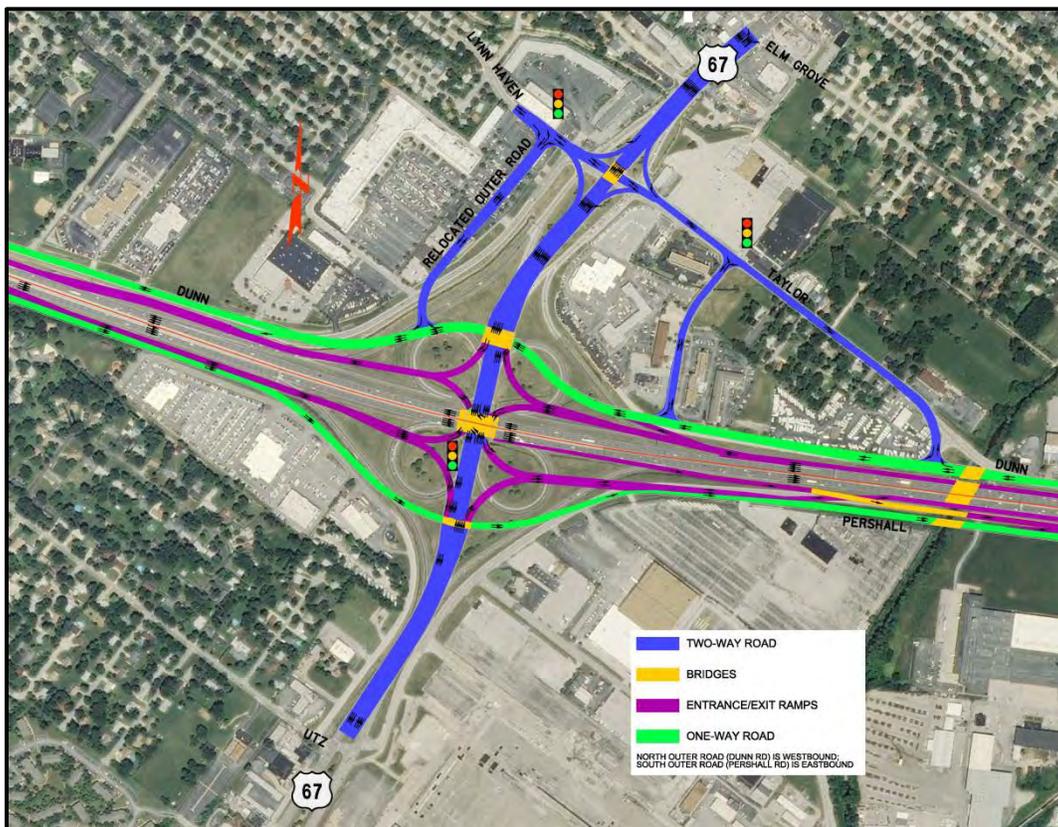


Figure 15: Single Point Urban Interchange (SPUI) at I-270/Lindbergh

5.3.5 Route 367 Interchange Reconfiguration

As with the Lindbergh, several interchange types were considered at the I-270/Route 367 interchange. These include a Single Point Urban Interchange (SPUI), as shown in **Figure 16**, standard diamond, and directional ramps. The focus of this alternative is to improve safety by eliminating the cloverleaf interchange and the associated weaving movements.

Preliminary analysis shows that either a SPUI or a directional ramps interchange would provide needed capacity and acceptable traffic operations, LOS D, or better for 2040 travel demands at this location. It is recommended that the environmental and design studies include a detailed evaluation of these alternative interchange configurations.

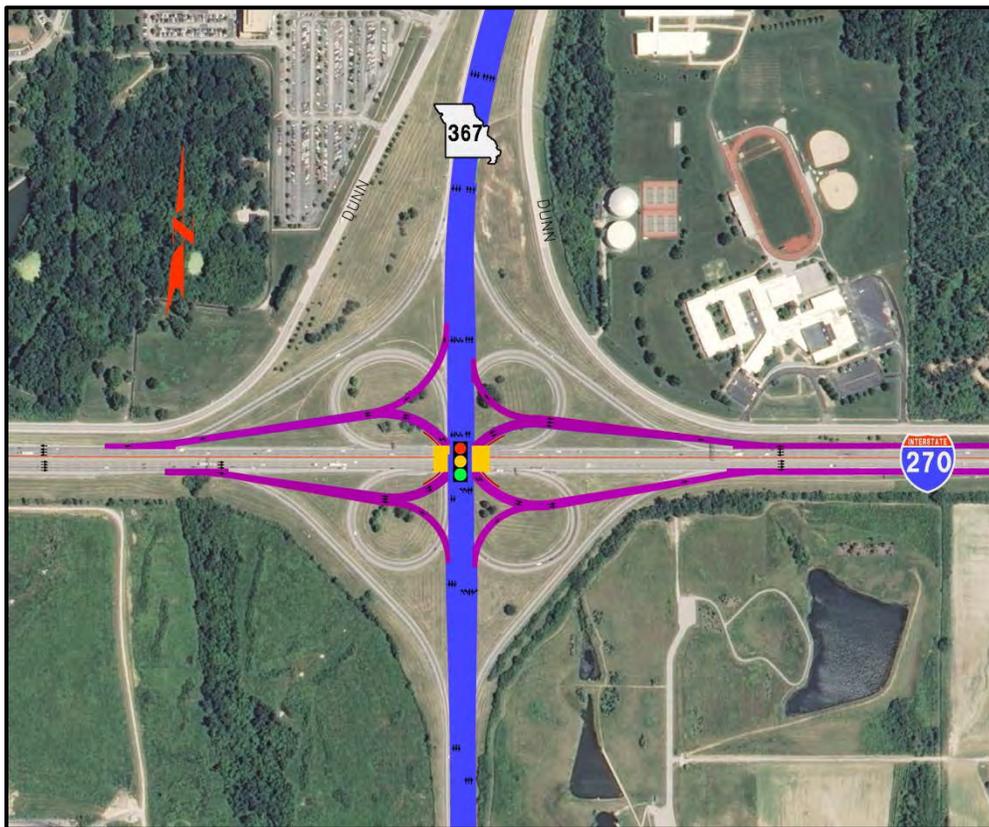


Figure 16: Single Point Urban Interchange (SPUI) at I-270 / Route 367

The Lindbergh and Route 367 interchange improvement concepts can be found in Appendix E.

5.4 Concepts Recommended for Environmental Study

Based on the above preliminary analysis of traffic operations, impacts and geometric features, as well as Tier II screening, the following three concepts are recommended for consideration during the environmental study. It is recognized that Lindbergh and Route 367 interchange

reconfigurations could be adapted either as stand-alone improvements or as part of the two corridor-wide alternatives.

5.4.1 No-Build

The no-build condition, representing existing facilities and any programmed improvements, will be included in the environmental study to set a base line condition. As shown in the traffic operational analysis, the no-build condition operates under failing conditions.

5.4.2 Two-way Outer Road System

As described in the previous section, maintaining the existing two-way outer road system (Dunn Road/Pershall Road) is the second alternative recommended for inclusion the environmental study. The two-way option is developed solely to address the existing two-way crossover slip ramps along westbound I-70. Under this alternative, no improvements are included along eastbound I-270. Although this alternative provides safety improvements by eliminating the crossover slip ramps, preliminary analysis shows that this alternative does not fully address the traffic operational needs of the corridor.

5.4.3 One-way Outer Road System

As described in the previous section, the one-way outer road system alternative converts Dunn Road to one-way westbound and Pershall Road to one-way eastbound. Access to and from I-270 is provided via slip-ramps. Preliminary analysis shows that one-way outer road system largely addresses the traffic operational needs of the corridor. However, it is recognized that the one-way alternative has the potential to create adverse travel and also has the potential to impact access for businesses and residences along the corridor. Given the fact that the one-way system significantly mitigates existing and forecasted traffic operational issues, the adverse impacts may turn out to be negligible. As such, this alternative is recommended for detailed analysis during the environmental study.

6.0 Public Involvement

The public involvement vision was designed to learn from and collaborate with stakeholders while also communicating key project messages to them. The public involvement principles used throughout the study process are:

- Open, constant communication between MoDOT and the community
- Transparent process
- Study information available in various formats
- Public input representative of community
- Educate and inform citizens

Throughout the public involvement plan, the following key messages were shared with the public:

- Traffic operational, safety and geometric improvements on I-270, between McDonnell Blvd and Route 367 are imperative because it is one of the most heavily traveled routes in the region.
- This route is vital for commuter and commercial travel because it connects to I-70 and I-55 and is used as a through-route for all users to I-70 across Missouri and Illinois.
- There is growing evidence of congestion and operational problems at several of the interchanges along the route. Many of these heavily-used interchanges, such as the Lindbergh/Lynn Haven Lane/Dunn Road interchange are functionally obsolete.
- Many bridges along this route are structurally deficient or in need of replacement or rehabilitation.
- MoDOT has no money for implementation.

In an effort to better engage and elicit feedback from the local community the Community Advisory Group (CAG) was formed. The CAG is made up of various members from the community, including but not limited to, elected leaders, municipalities, business executives, local school administrators, advocacy groups, and law enforcement. The roles and responsibilities of the CAG were:

- Help distribute study information
- Inform study team of public sentiment
- Provide feedback on key design proposals
- Serve as study ambassadors
- CAG members are advisors to the study team; MoDOT will ultimately be responsible for making final decisions.

The study team met with the CAG on four separate occasions to learn from and listen to better understand the needs and opportunities along the study area.

Table 4: CAG Meeting Schedule

Meeting	Date	Purpose
CAG Meeting 1	April 7, 2011	Received feedback on the needs and opportunities along the I-270 North Corridor and reaffirm guiding principles.
CAG Meeting 2	August 26, 2011	Joint workshop on conceptual alternatives for the corridor and Tier I screening methodology.
CAG Meeting 3	February 22, 2012	Joint workshop on the alternatives analysis and Tier II screening methodology.
CAG Meeting 4	May 22, 2012	Received feedback on the Recommended Concepts to take forward in NEPA

The study team hosted two open-house public meetings at the St. Louis Community College-Florissant Valley. In addition to the traditional public meeting, on both occasions a “virtual” or on-line public meeting was held for a period of two weeks following the physical meeting. As part of these public meetings, the study team provided surveys for the public to provide feedback.

Table 5: Public Meeting Schedule

Meeting	Date	Attendees		Purpose
		Traditional	Virtual	
Public Meeting 1	April 14, 2011	50	116	Receive feedback on the needs and opportunities along the I-270 North Corridor
Public Meeting 2	May 22, 2012	71	202	Receive feedback on the Recommended Concepts to take forward in NEPA

In addition to the meetings, the study team also used the following methods to share information with the public:

- Social Media
- Newsletter
- Speeches and presentations
- Stakeholders List (consisting of approximately 300 emails)
- Webpage
- Legacy or traditional media
- On-line newspapers

7.0 Summary and Recommendations

This study has identified several existing traffic operational, geometric, and safety constraints along the I-270 corridor in North St. Louis County. The identified constraints include aging infrastructure; limited mainline capacity; over-saturated and closely-spaced interchanges; lack of accessibility for pedestrians and bicyclists; and confusing two-way, cross-over, slip ramps from I-270 to Dunn Road. With a forecasted increase in travel demand of approximately 25%, by the year 2040, it is anticipated that these constraints would worsen future congestion, traffic operations, and safety on the corridor.

After the team analyzed existing conditions, it worked to develop preliminary concepts to address the identified problems and needs on the corridor. These preliminary concepts consisted of a wide range of ideas including:

- adding auxiliary lanes
- widening I-270
- removing/consolidating access to and from I-270
- relocating cross-over slip ramps
- managing access
- maintaining existing two-way outer roads
- creating a one-way outer road system
- improving several stand-alone interchanges

The study team engaged both the CAG and the public to further develop and refine the concepts to improve the I-270 North Corridor. The preliminary concepts were then screened, as part of the Tier I screening, to develop a suite of alternatives to undergo more detailed analyses.

Near-term concepts are alternatives that can be completed at low cost and relatively quickly that will provide relief to the corridor for several years. They include the addition of an auxiliary lane between Lindbergh and I-170, restriping westbound I-270 at Lindbergh to improve lane configuration, and modifications along McDonnell Blvd. The three near-term concepts above are recommended for implementation. In fact, restriping westbound I-270 at Lindbergh to improve lane configuration has already been included as part of the programmed Lindbergh project.

Long-term concepts are alternatives that require a larger financial investment but will improve operations in the corridor for many years. They include widening I-270, two-way outer road system, one-way outer road system, and interchange reconfigurations at Lindbergh and Route 367 interchanges.

The following corridor improvement concepts are recommended for inclusion in further environmental and design studies:

1. No-build
2. Outer roads remain two-way from McDonnell Blvd to Route 367
3. Outer roads are converted to one-way from McDonnell Blvd to Route 367

The Lindbergh and Missouri Route 367 interchange reconfigurations will be adapted either as stand-alone improvements or as part of the two corridor-wide concepts.

Table 6: Near- and Long-Term Improvement Concepts

Near-Term Improvement Concepts	
Recommendations	Conceptual Estimate* (Millions)
Eastbound Auxiliary Lane between Lindbergh and I-170	\$0.85 M
Improve Lane Utilization on McDonnell Blvd	\$0.75 M
Long-Term Improvement Concepts	
Recommendations	Conceptual Estimate* (Millions)
Lindbergh Single Point Urban Interchange (SPUI) Only	\$25 M
Route 367 Single Point Urban Interchange (SPUI) Only	\$18 M
Widen and Rebuild I-270 in which the Outer Roads remain two-way, from McDonnell Blvd to Route 367 (Including Lindbergh & Route 367 Interchanges)	\$350M - \$385M
Widen & Rebuild I-270 in which the Outer Roads are Converted to One-Way, from McDonnell Blvd to Route 367 (Including the Lindbergh & Route 367 Interchanges)	\$320M - \$360 M

* Construction and Right-of-Way Costs, in Current Dollars.

Appendix

Appendix A- Glossary

Bikeway

Any road, path, or way that is specifically designated as being open to bicycle travel, regardless of whether such facility is designated for the exclusive use of bicycles or is to be shared with other transportation modes.

Capacity

The number of people and /or vehicles that can be accommodated on a specific transportation facility (roadway, bridge, transit vehicle, for example) during a defined time period.

Collectors

Classification of roadways that carry vehicles to and from arterial roads and provide access and circulation within residential neighborhoods.

Congestion

The volume of traffic at which drivers experience significantly slower travel times, increased costs, and greater likelihood of crashes.

Cordon Line

A boundary that defines a metropolitan transportation study area for the purpose of surveying and modeling traffic.

Corridor

A defined geographic area characterized by common travel patterns. This is often the geography for which transportation improvements are analyzed, through what is called a “corridor study.”

Council of Governments

A voluntary association of local government units that work together to study issues and/or solve problems in a geographic area.

Dedicated Funding

Public monies that, by law, can only be used for a specific purpose and cannot be diverted to other uses. Contrasts with “flexible funding,” which can be diverted.

Design Life

The time period for which a transportation facility is built to last – typically 20-30 years.

East-West Gateway Council of Governments

The Metropolitan Planning Organization (MPO) for the eight-county region that includes the City of St. Louis, Franklin, Jefferson, St. Charles and St. Louis counties in Missouri and Madison, Monroe, and St. Clair counties in Illinois. As an MPO, East-West Gateway is responsible for the coordinated planning of federally-funded transportation projects and programs in the region. www.ewgateway.org

Economic Development

Increase in wealth, wages, and productivity in metropolitan region. One of the goals of the transportation plan is to support sustainable economic development.

Efficiency

How well the transportation system serves the needs of customer, per unit for resources spent.

Environmental Justice

The equitable distribution of costs and benefits associated with any federal investment on all members of the community. An environmental justice analysis seeks to ensure that low-income persons and people of color, in particular, benefit from federal investments and do not experience disproportionate adverse environmental and health impacts.

Expressway

A divided high-speed roadway having two or more traffic lanes in each direction, with limited controlled access.

Fixed Route Service

Transit service provided on a repetitive, fixed schedule along a specific route with designated stops. "Bus routes" are examples of fixed route service, contrasted with flexible routing.

Freeway

A divided Arterial highway designed for the unimpeded flow of large volumes of through-traffic.

Functional Classification

The grouping of streets and highways into classes, or systems, according to the service they are intended to provide.

Grade Separation

A vertical separation between intersecting roads or railroad tracks as one facility travels over another via an overpass or other structure.

Headway

The time interval between vehicles moving in the same direction on a particular route. For example, ten minute headway means that the bus comes every ten minutes.

Highway

Roads, streets, and parkways, including right-of-ways, bridge, railroad crossings, tunnels, drainage structures, signs, guardrails, and protective structures.

Illinois Department of Transportation

The state agency responsible for designing, building, and maintaining Illinois' transportation network. The agency helps coordinate the development and improvement of airports, rail facilities, and ports. It also can assist in the operational cost of transit systems. The local district office is in Collinsville. www.dot.state.il.us

Incident

A traffic crash, stalled vehicle, load spillage or any other event that blocks or impedes traffic flow in one or more lanes.

Infrastructure

The physical facilities that support necessary social and commercial functions, including transportation, waste systems, public housing, sidewalks, utility installations, parks, public buildings, and communications networks.

Intermodal

A transportation system connecting or including different modes of transportation.

Interstate

That system of highways that connects the principal metropolitan areas, cities, and industrial centers of the United States. The routes of the interstate system are selected by joint action of the highway department of each state and the adjoining states, subject to the approval of the US Secretary of Transportation and Congress.

Land Use

Property is often grouped in categories by usage, including commercial, residential, retail, industrial, recreational or green space.

Legacy 2035

The region's long-range transportation plan that sets the agenda for future investment decisions regarding the area's transportation system. The focus areas are preservation of the existing infrastructure, safety and security, congestion, access to opportunity, sustainable development, and efficient movement of goods. The plan is updated every four years.

Level of Service

A description of the state of a transportation facility rated on a scale of "A" to "F." For a highway, an "A" rating means traffic is flowing freely and "E" and "F" means it is very congested. Other LOS highway measurements include density, speed and maximum service flow.

Long-Range Plan

A document that is an assessment of a region's transportation facility, service and policy needs over the next 25 to 30 years. The plan considers a wide range of social, environmental, energy and economic factors. The plan considers overall regional goals and how transportation can meet those goals within financial limits.

Metro

The regional transit agency, formerly known as the Bi-State Development Agency. Formed in 1949 through a compact between Illinois and Missouri that was approved by the US Congress, Metro owns and operates the region's mass transit system and has the power to act across local, county and state boundaries to develop regional transportation programs. Metro's network consists of buses, light rail, the Gateway Arch transportation system, the Arch Parking Garage and the St. Louis Downtown Airport. www.metrostl.org

MetroBus

The motor vehicle operated by the regional transit agency, Metro, to transport passengers.

Metropolitan Planning Organization (MPO)

A group of local officials with the federal mandate to develop transportation plans and programs for urban areas with a population of more than 50,000. MPOs are formed by agreement with the state's governor and representatives of local governments that represent at least 75 percent of the affected population. East-West Gateway Council of Governments was incorporated in 1965 as the MPO for the City of St. Louis and Franklin, Jefferson, St. Charles and St. Louis counties in Missouri and Madison, Monroe and St. Clair counties in Illinois.

Minor Arterial

Roadways that connect and augment the principal arterial system.

Missouri Department of Transportation

The state agency responsible for designing, building, and maintaining Missouri's transportation network. The agency helps coordinate the development and improvement of airports, rail facilities, and ports. It also can assist in the operational cost of transit systems. The local district office is in Chesterfield. www.modot.gov

Mode

The type or means of travel, including auto driver/passenger, mass transit passenger, cyclist, equestrian, pedestrian or other.

Multimodal

Multimodal refers to the integration of various types of transportation in one system. A goal of planning is the achievement of a seamless multimodal system.

Network

A graphic or mathematical representation of travel paths that is used in the travel demand model.

Off-peak Period

Times of the day when travel volume is generally lower and less transit service is scheduled. This is also called a "base period."

Operating Expenses

Money paid for salaries, wages, materials, supplies, fuel and equipment used to maintain property, roads, bridges, equipment and buildings. Also would cover funds needed to operate vehicles, rent equipment and facilities and settle claims.

Peak Hour/Peak Period

The defined time period in the morning or evening in which the largest volume of travel is experienced. Also called rush hour.

Principal Arterial

Three distinct classifications: interstates, other freeways and expressways. Serves major through movements between important centers of activity in a metropolitan area and a substantial portion of trips entering and leaving the area.

Programming

The designation of money for transportation projects which when approved are included in the transportation improvement program (TIP).

Public Transportation

Buses, trains and other vehicles that can be used on a regular basis by any member of the community.

Right-of-Way (ROW)

A common law or statutory allowance granted so that a public road, utility line or railroad can pass through a strip of land.

Transit

Passenger service provided to the general public along fixed routes with regular or variable schedules available, for published fares.

Transportation Analysis Zone (TAZ)

An area used to study the effects of traffic and transit on an area that can be from one to 10 square miles in area.

Transportation System Management (TSM)

The TSM consists of projects that are non-capital intensive and that improve the efficiency of a transportation system. This includes refinement of system and traffic management, the use of bus priority or reserved lanes, and parking strategies.

Travel Demand Model

A mathematical representation of human travel behavior that is designed to forecast travel so that problems can be defined and solutions can be tested.

Travel Time

The measurable interval it takes to cover a distance door-to-door. In transportation planning, measures of travel time include the time spent accessing, waiting and transferring between vehicles.

Trip

A one-direction movement from an origin to a designation.

Trans-loading

The process of transferring a shipment from one mode of transportation to another.

Urbanized Area

An area of 50,000 or more residents designated by US Census Bureau, that includes a central city or two adjacent cities but excludes the rural portion of the cities.

Vehicle Miles of Travel

The sum of all the miles traveled by a vehicle in a specific amount of time with no consideration of how many people were involved.

Volume to Capacity Ratio

A measurement of roadway congestion by comparing the current volume of traffic to the capacity for which it was designed. A low ratio reflects relatively free flowing conditions and a high ratio is typical of congested conditions.

Weaving Section

A part of the highway usually formed when merging areas are closely followed by diverging areas. The sections are formed when two or more vehicle flows must cross paths along a length of roadway.