

3.0 Alternative Development and Analysis

The development of corridor alternatives for the Gateway Connector was undertaken using a stepwise approach within each of five sections of the study area. These sections are identified in Figure 3-1 and include the following:

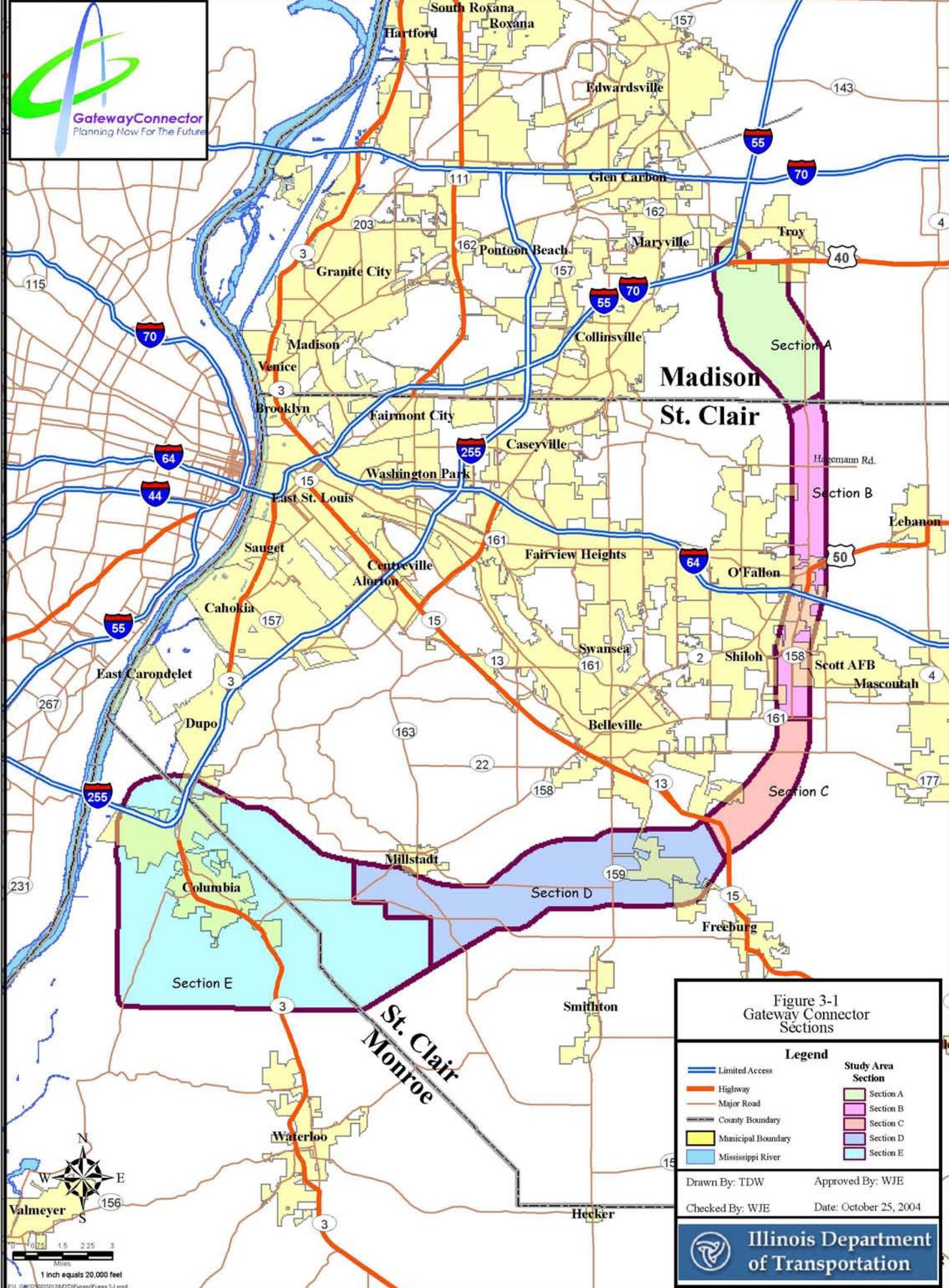
- **Section A** – From the northern study area terminus at the I-55/70-U.S. Route 40 interchange in Troy, south to Troy-O’Fallon Road to approximately the Madison/St. Clair County line.
- **Section B** – From St. Clair County line south along Troy-O’Fallon Road, extending along Illinois Route 158 across I-64, to Illinois Route 161.
- **Section C** – From Illinois Route 161 south and west to Illinois Route 13.
- **Section D** – From Illinois Route 3 west, extending across Illinois Route 159 along and north of Freeburg-Douglas Road, to a variable endpoint south and west of Millstadt.
- **Section E** – From the western terminus of Section D, extending west, north and south of Columbia, terminating at I-255.

Section limits were initially developed to provide reasonable boundaries of analysis between logical end points or points of congruence. For example, Section A was bounded on the north by the logical terminus of the interchange at I-55/70 and U.S. Route 40, and was bounded on the south by a logical narrowing of the corridor at Troy-O’Fallon Road. Additionally, the formulation of these sections provided for the development and evaluation of a manageable series of preliminary alternative corridors within a similar geographic context.

Corridor development was a dynamic process that entailed a consideration of factors related to engineering feasibility and cost, traffic operations and safety, social and economic impact, natural resources impacts, and specific input from the public and agency representatives. Initial corridor alternatives were formulated using the following as general developmental guidelines:

- Corridors should provide service to existing and future transportation generators.
- Corridors should be located to enhance engineering feasibility.
- Corridors should be developed to accommodate the full range of future transportation facility types.
- Corridors should avoid “critical flaw” environmental resources [natural areas, 4(f)/6(f) resources, endangered species, cemeteries, Comprehensive Environmental Response, Compensation, and Liability Act sites, etc.].
- Corridors should avoid and minimize impacts to land use (residential and business impacts, noise impacts, recreational lands, etc.).
- Corridors should avoid and minimize impacts to natural resources (streams, wetlands, waterbodies, groundwater resources, terrestrial resources, etc.).
- Corridors should avoid and minimize impacts on agricultural resources and farm operations (prime farmland, farm severances, etc.).

Constraints, or limitations to corridor development, were initially mapped to assist in the development of 1,000-foot wide preliminary alternative corridors. Constraints considered during this process entailed those that represented environmental concerns as well as those that had



**Figure 3-1
Gateway Connector
Sections**

Legend	
	Limited Access
	Highway
	Major Road
	County Boundary
	Municipal Boundary
	Mississippi River
	Study Area Section Section A
	Section B
	Section C
	Section D
	Section E

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0 0.25 0.5 1 1.5 2.25 3
Miles
1 inch equals 20,000 feet

implications with regard to engineering feasibility. Examples of environmental constraints considered during the location study included:

- residences and businesses;
- agricultural land and operations;
- wetlands;
- floodplains;
- surface water resources (streams, water bodies);
- threatened and endangered species;
- rare or unique ecological communities;
- nature preserves;
- geologic resources (areas of past mining);
- potential or known hazardous waste sites;
- Section 4(f) and 6(f) lands;
- Conservation Reserve Program/Wetland Reserve Program lands;
- Centennial farms;
- archaeological or historic sites;
- sensitive noise receptors; and
- churches, schools and cemeteries.

Similarly, constraints were also identified that had implications on engineering feasibility or on the efficiency of the transportation system. Examples of such considerations included:

- terrain;
- capacity of the existing roadway (i.e., LOS);
- accident patterns;
- access to existing development; and
- existing infrastructure (roads, utilities, railroads, transmission lines).

Constraint information was developed by acquiring and consolidating information from a variety of sources including public involvement meetings, file information from IDOT, other state agencies (i.e., Illinois Department of Natural Resources, Illinois State Geological Survey, Illinois Transportation Archaeological Research Program and federal agencies [i.e., Natural Resources Conservation Service (NRCS), U.S. Fish and Wildlife Service (USFWS), U.S. Environmental Protection Agency (USEPA), Federal Emergency Management Agency (FEMA), U.S. Geological Survey (USGS), and field reconnaissance.

The initial effort to consider project constraints resulted in the identification of the following critical environmental and engineering issues:

- **Cultural Resources.** A review of recorded National Register of Historic Places (NRHP) listings resulted in several listed historic architectural resources in the project vicinity (Columbia and SAFB). Additionally, several previously recorded archaeological sites were also identified, as were high potential archaeological areas within selected stream valleys. Numerous small cemeteries are also known to occur within the study corridor.
- **Rare, Threatened, or Endangered Species.** Federal and state listed threatened or endangered species potentially occurring in the region include the bald eagle (federally threatened, FT), decurrent false aster (FT), Indiana bat (federally endangered, FE), gray bat (FE), Illinois cave amphipod (FE), interior least tern (FE), and common moorehen (state threatened, ST). Among these, however, the Illinois cave amphipod is of greater concern as the amphipod had primarily been reported from Stemler Cave east of

Columbia. While it has not been observed since 1965, Stemler Cave is considered to be an important part of the recovery plan for this species.

- **Parklands.** Several natural areas dedicated as part of the Illinois Nature Preserves system are located within the project study area east of Columbia. These nature preserves are located within the Illinois Sinkhole Plain and consist of a subterranean cave system (Stemler Cave), as well as surface sinkhole-containing areas that support a range of upland community types.
- **Social and Economic Disruption.** Existing and proposed residential and business developments were identified within the project area. Given the rapid rate of development in the region, this information required frequent updating over the course of the study as new residential subdivisions were identified in previously undeveloped areas of Troy, O'Fallon, Belleville, Shiloh, Millstadt, Freeburg, and Columbia. Such developments were considered carefully to avoid displacement effects and access issues as well as noise related impacts.
- **Floodways/Floodplains.** The study area crosses several floodplains, most of which are perpendicular crossings. These include Ogles Creek, Engle Creek, Loop Creek, Richland Creek, Douglas Creek and the West Fork of Richland Creek in St. Clair County; and Carr Creek and the Mississippi River in Monroe County. A portion of the Carr Creek and Mississippi River floodplain is partly levee-protected and is designated as the American Bottoms.
- **Traffic and Access Issues.** Generally, there are no significant constraints pertaining to traffic and access except in two areas. The existing intersection of Illinois Route 158 and U.S. Route 50 and its proximity to I-64 (about 3,900 feet north) poses some challenges to managing access and weaving between these three busy routes. Existing Illinois Route 3 through Columbia is also heavily traveled (approximately 24,000 vehicles per day) and provides limited access via several signalized intersections. Adjacent land use is commercially developed posing costly constraints to widening opportunities along Illinois Route 3 through Columbia.
- **Engineering Issues.** There are some engineering elements that pose challenges to the development of a future transportation facility in the study area. The major interchanges at I-55/70 in Madison County, I-64/U.S. Route 50 in St. Clair County and I-255/Illinois Route 3 in Monroe County are all heavily traveled and the addition of a new facility (the Gateway Connector) at these interchanges requires more complex engineering designs to ensure that the new facility handles the various movements at these interchanges. Additionally, the design of the new facility needs to consider the floodplain of the Mississippi River. The portion of the facility will need to be designed to be above the 100-year floodplain elevation, which will pose design challenges in maintaining access to the adjacent road network.

Consideration of these various constraints resulted in the development of preliminary 1,000-foot wide alternative corridors as presented in Figure 3-2 (see Appendix B for more detailed presentation of preliminary alternative corridors).

Subsequent to the development of these preliminary alternative corridors, and their presentation to the SMG, elected officials, agencies, and the public, these corridors were refined and narrowed to 400-foot wide "final corridor alternatives" (Figure 3-3). In order to provide for the full range of future transportation facilities, the 400-foot wide corridor was expanded in selected areas (e.g., potential future interchange locations). Alternative development within each

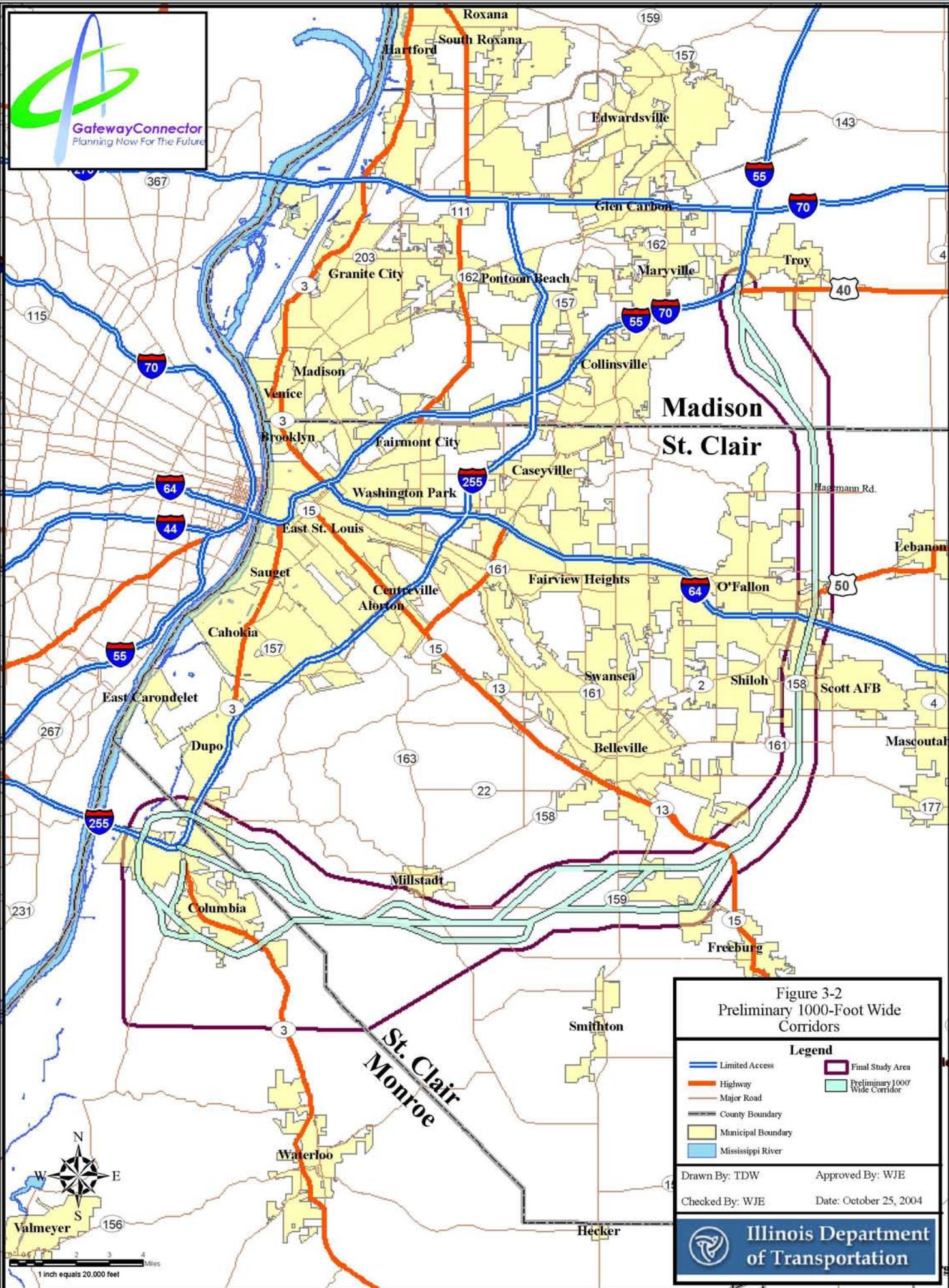


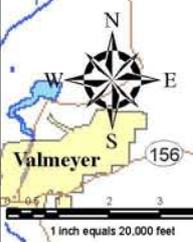
Figure 3-2
Preliminary 1000-Foot Wide Corridors

Legend

- Limited Access
- Highway
- Major Road
- County Boundary
- Municipal Boundary
- Mississippi River
- Final Study Area
- Preliminary 1000' Wide Corridor

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section was undertaken by formulating “reasonable” alternatives that satisfactorily met the overall project Purpose and Need, while also avoiding and minimizing environmental and engineering constraints. Particular emphasis was placed on:

- avoiding or minimizing impacts to those resources that by law require avoidance and minimization measures [federally listed threatened and endangered species, Illinois listed nature preserves, wetlands – e.g., 404(b)(1) of the Clean Water Act (CWA), the U.S. Department of Transportation policy on lands, wildlife and waterfowl refuges and historic sites for Section 4(f) resources, Executive Orders 11988, 11990 and 12898, etc.]; and
- avoiding or minimizing impacts that would result in high mitigation commitments and overall project cost (e.g., disruption of businesses, displacement of existing infrastructure or utilities, clean-up activities of properties listed as containing hazardous materials, extensive wetland mitigation, etc.).

Following another series of input, comment, and corridor adjustments as described in Section 6.0, the final alternative corridors were evaluated in detail to select a single Preferred Corridor (Figures 3-4 and 3-5) that would form the basis of the preserved corridor. This alternative evaluation process, described in Appendix B, utilized extensive quantitative data developed for each final alternative corridor as a basis for decision-making. In all, a total of 24 separate criteria were used to evaluate each alternative. The evaluation was conducted independently for each section of the study area (i.e., Section A alternatives were evaluated independently of Section B alternatives, etc.). This allowed the study team to focus on issues unique to each section during the evaluation.

The construction costs of the Preferred Corridor were developed for the purposes of overall planning. These estimates are very preliminary and do not constitute detailed engineering. Right of way costs are not part of this construction estimate. These costs will be developed in the next phase of study when a more definitive footprint is developed through the National Environmental Policy Act process. It can be assumed that the right of way costs would add an additional 15 to 20 percent to the construction costs. The construction costs are indicated in Table 3-1.

Table 3-1. Cost Estimate for the Preferred Alternative

	Section A Alt. A2	Section B Alt. B2	Section C Alt. C2	Section D Alt. D2	Section E Alt. E13	Total
Length						
Feet	28,800	47,500	23,860	60,880	55,900	216,940
Miles	5.5	9.0	4.5	11.5	10.6	41.1
Cost Per Mile	\$7,000,000	\$2,000,000	\$7,000,000	\$7,000,000	\$7,000,000	--
Mainline Cost	\$38,200,000	\$18,000,000	\$31,600,000	\$80,700,000	\$74,100,000	\$242,600,000
Interchange Costs						
I-55/70	\$35,000,000					\$35,000,000
Scott-Troy	\$6,000,000					\$6,000,000
Hagerman		\$6,000,000				\$6,000,000
I-64/Route 50		\$30,000,000				\$30,000,000
Seibert		\$15,000,000				\$6,000,000
Routes 161/177			\$6,000,000			\$6,000,000
Route 15			\$15,000,000			\$15,000,000
Route 159				\$15,000,000		\$15,000,000
Floraville				\$5,000,000		\$5,000,000
Route 158 Millstadt				\$5,000,000		\$5,000,000
Routes 158/3					\$6,000,000	\$6,000,000
I-255 Recon.					\$3,000,000	\$3,000,000
Quarry Road					\$15,000,000	\$15,000,000
Total Cost	\$79,200,000	\$69,000,000	\$52,600,000	\$105,700,000	\$98,100,000	\$395,600,000
<i>Source: MACTEC, 2004.</i>						<i>Prepared by/Date: SCC/10-27-04</i>
						<i>Checked by/Date: RMS/11-01-04</i>

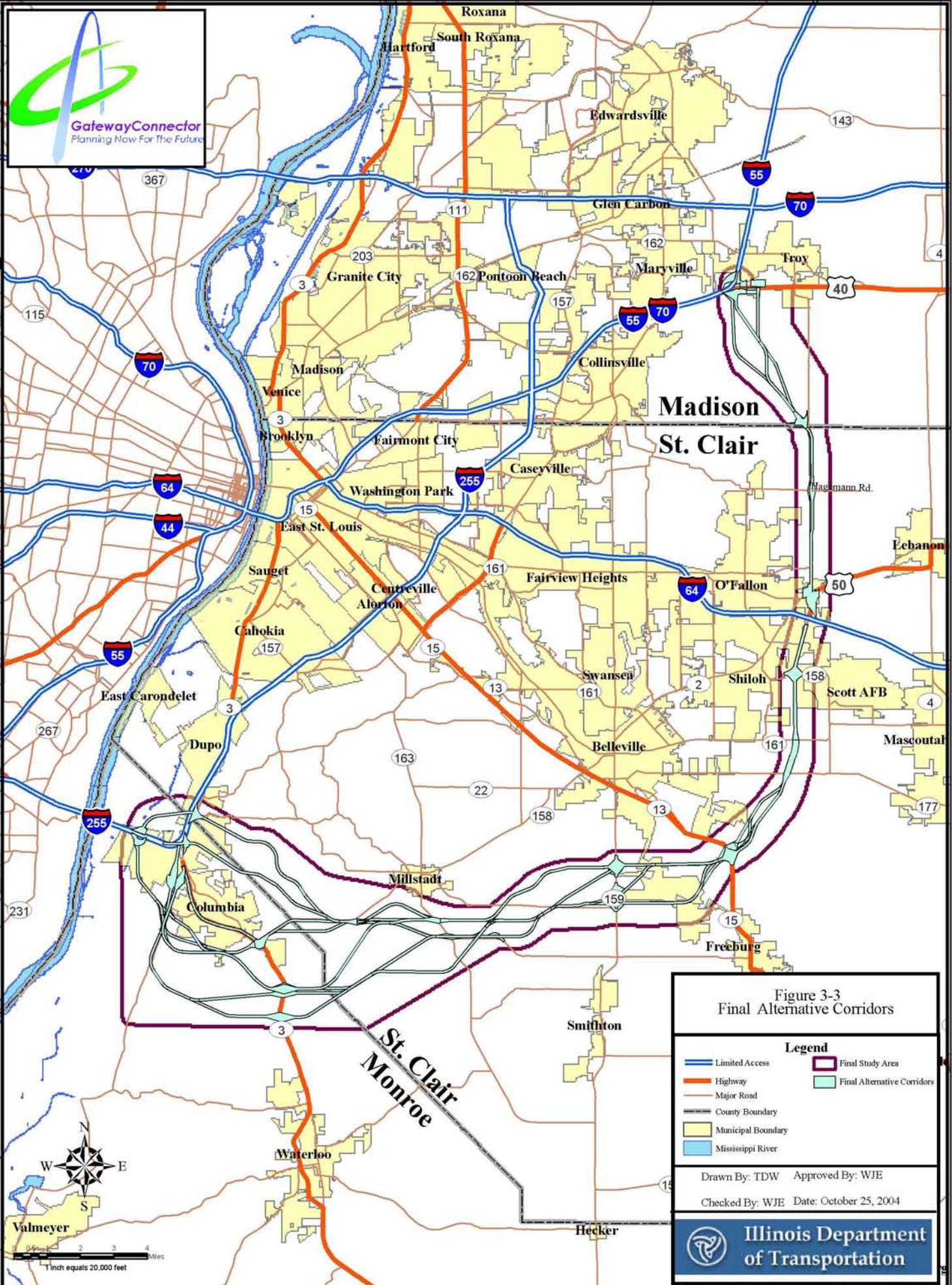


Figure 3-3
Final Alternative Corridors

- Legend**
- Limited Access
 - Highway
 - Major Road
 - County Boundary
 - Municipal Boundary
 - Mississippi River
 - Final Study Area
 - Final Alternative Corridors

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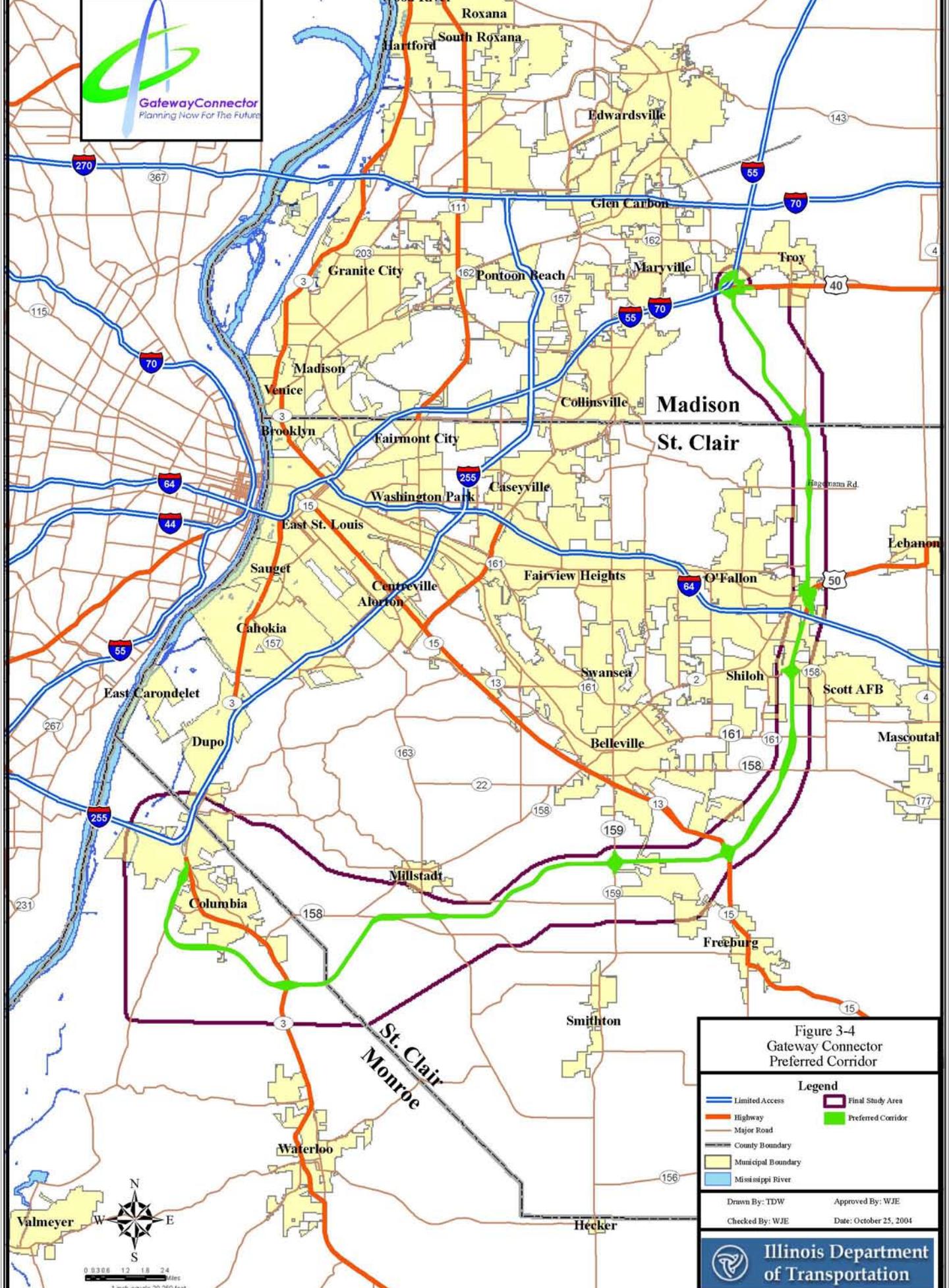


Figure 3-4
Gateway Connector
Preferred Corridor

Legend	
	Limited Access
	Highway
	Major Road
	County Boundary
	Municipal Boundary
	Mississippi River
	Final Study Area
	Preferred Corridor

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