**Final**
**MTIA Report**

# CROSS-COUNTY CORRIDOR
# MAJOR TRANSPORTATION INVESTMENT ANALYSIS
# for
# ST. LOUIS, MISSOURI

**PREPARED FOR THE**
**MISSOURI DEPARTMENT OF TRANSPORTATION**
**AND THE**
**EAST-WEST GATEWAY COORDINATING COUNCIL**

**PREPARED BY**
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## SUMMARY

This Major Transportation Investment Analysis Report summarizes the work performed in Phases 1 and 2 of the St. Louis Cross-County Corridor Major Transportation Investment Analysis. This report summarizes the analysis of the transportation strategies considered and documents the decisions made by the Study Management Group regarding the strategies recommended to proceed into the next phase of project development in the Cross-County Corridor.

The report provides a brief summary of the Phase 1 study activities, outlining the principal problems identified and the methodologies employed in that process. It includes a brief summary of the Phase 1 screening process and the transportation strategies recommended by the Study Management Group to be advanced into the Phase 2 analysis.

A more detailed summary of the Phase 2 activities is presented, including a summary of the Phase 2 public involvement activities, the refinement and conceptual engineering of the discrete strategies developed in Phase 1 in each of the four subcorridors, and the combination of those discrete strategies into multimodal "strategy sets" covering the entire study area. These ten strategy sets are the final alternative solution packages, and cover a broad range of potential investment levels with varying combinations of highway and transit solutions.

The report documents the process used in comparative evaluation of the ten strategy sets, and describes the performance measures used for that evaluation. A matrix presenting 50 different performance measures for each of the strategy sets is included. The report also summarizes a possible weighting process for use by the Study Management Group to allow reduction of the evaluation process into a more manageable number of evaluation criteria. The report also presents comparative analyses of both the Strategy Sets and the Discrete Strategies evaluated during the course of this study. Finally, the document presents the recommendations approved by the Study Management Group and adopted by the East-West Gateway Coordinating Council's Board of Directors.

Included as a part of this report, but bound in a separate 11" x 17" document entitled Major Transportation Investment Analysis Report Exhibits, is a set of exhibits detailing the discrete strategies recommended in Phase 2 by the SMG and adopted by the EWGCC Board, shown on aerial photography base mapping at a scale of 1" = 400'.

## TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE OF THIS DOCUMENT

1.2 STUDY OVERVIEW

2.0 SUMMARY OF PHASE 1

2.1 PROBLEM IDENTIFICATION

2.2 PUBLIC INVOLVEMENT

2.3 DEVELOPMENT OF STUDY TECHNICAL MEMORANDA

2.4 STRATEGIES RECOMMENDED FOR FURTHER STUDY IN PHASE 2

3.0 PHASE 2 CONCEPTUAL ENGINEERING

3.1 SPECIFIC STRATEGIES

3.2 LEVEL OF DETAIL

4.0 PHASE 2 PUBLIC INVOLVEMENT

4.1 COMMUNITY OUTREACH MEETINGS

4.2 NEWSLETTERS

4.3 PUBLIC OPINION SURVEY

5.0 PHASE 2 DEVELOPMENT OF ALTERNATIVE STRATEGY SETS

5.1 DISCRETE STRATEGIES

5.2 RATIONALE FOR STRATEGY SETS

5.3 PHASE 2 STRATEGY SETS

6.0 EVALUATION OF PHASE 2 STRATEGIES

6.1 TRAVEL FORECASTING

**TABLE OF CONTENTS**
**(Continued)**

6.2 TRANSPORTATION IMPACTS

6.3 COST ESTIMATES

6.4 SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS

6.5 FINANCIAL ANALYSIS

7.0 COMPARISON OF ALTERNATIVE STRATEGY SETS

7.1 COMPARISON OF STRATEGY SETS

7.2 COMPARISON OF DISCRETE STRATEGIES

8.0 FINDINGS AND RECOMMENDATIONS

8.1 STUDY MANAGEMENT GROUP MEETINGS

8.2 STUDY MANAGEMENT GROUP RECOMMENDATION

8.3 EAST-WEST GATEWAY BOARD ACTION

## LIST OF TABLES

Table 7-1 Evaluation Process Hierarchy
Table 7-2 Summary of Weighted Scores
Table 7-3 Comparison of Key Performance Indicators
Table 7-4 Summary Comparison of Discrete Strategies

## LIST OF FIGURES

Figure 1-1 St. Louis Metropolitan Region
Figure 1-2 General Study Area
Figure 5-1 Strategy Set No. 1
Figure 5-2 Strategy Set No. 2
Figure 5-3 Strategy Set No. 3
Figure 5-4 Strategy Set No. 4
Figure 5-5 Strategy Set No. 5
Figure 5-6 Strategy Set No. 6
Figure 5-7 Strategy Set No. 7
Figure 5-8 Strategy Set No. 8
Figure 5-9 Strategy Set No. 9
Figure 5-10 Strategy Set No. 10
Figure 7-1 Evaluation Process Structure
Figure 8-1 Adopted Strategies

# 1.0 INTRODUCTION

## 1.1 PURPOSE OF THIS DOCUMENT

The purpose of this Major Transportation Investment Analysis (MTIA) Report for the St. Louis Cross-County Corridor is to summarize the MTIA study process and the principal findings of that study. These findings were provided to the Study Management Group (SMG) to allow them to recommend the preferred major transportation improvements within the study area. The SMG's recommendation was subsequently presented to the East-West Gateway Coordinating Council Board of Directors for their approval and incorporation into the official Long Range Transportation Plan (LRTP) for the St. Louis region.

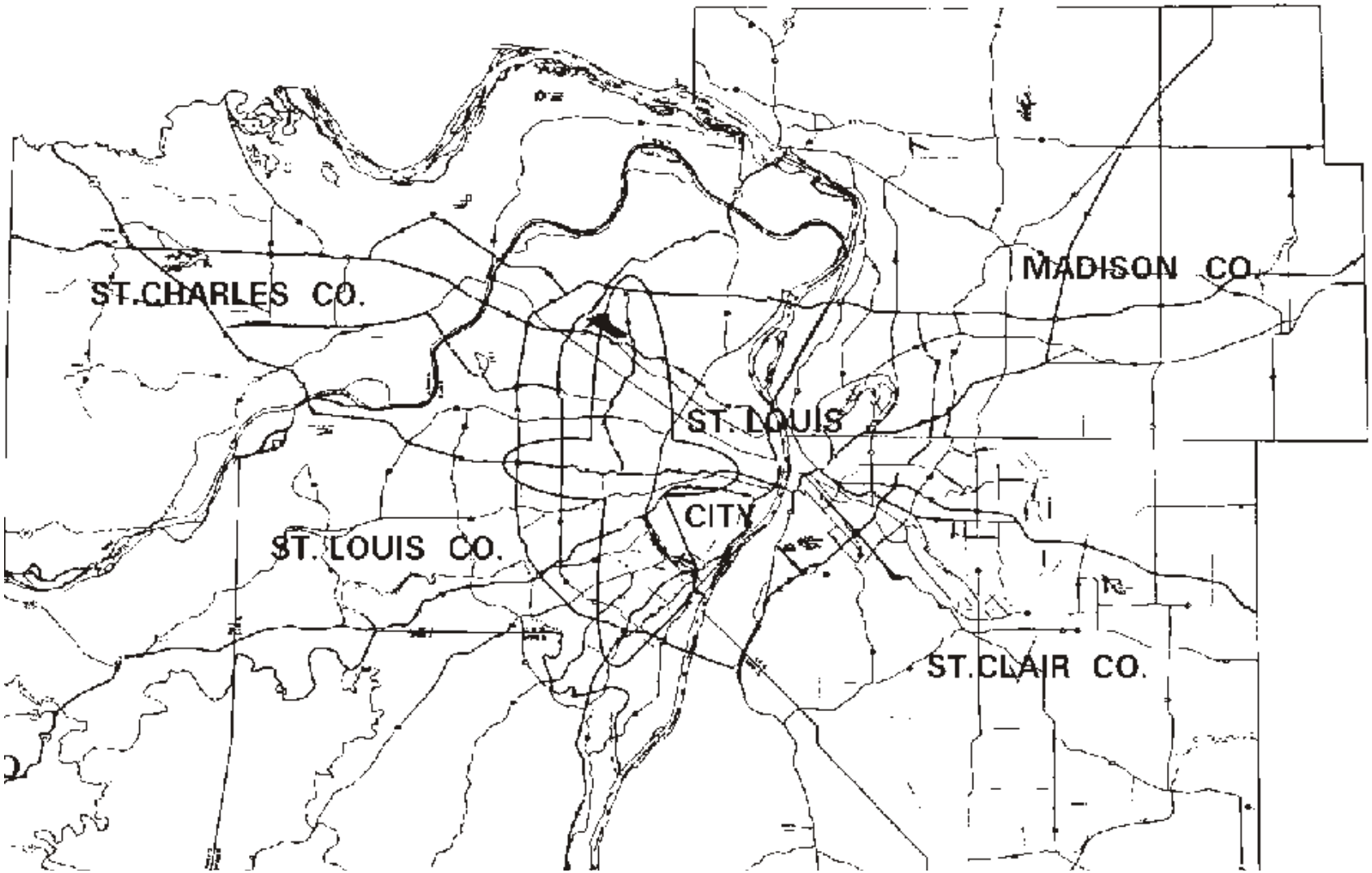
## 1.2 STUDY OVERVIEW

### 1.2.1 Study Purpose

As defined in Transportation Redefined, the St. Louis region's long range transportation plan, a Major Transportation Investment Analysis (MTIA) is a type of evaluation and decision-making process for highway and/or transit improvements which have the potential for incurring substantial costs or causing significant alteration of travel patterns. The principal aim of the study is to define the general scope and design concept of the preferred transportation solution within a particular corridor.

### 1.2.2 Study Area

The study area of the St. Louis Cross-County Corridor actually consists of two linear corridors that intersect to form a general cross-shaped study area. A north-south corridor extends southward from the vicinity of the I-270 / I-170 interchange on the north to the general vicinity of the I-270 / I-55 interchange on the south. An east-west corridor extends from east of the I-64 / I-270 interchange in St. Louis County eastward to the general vicinity of the I-64 / Grand Boulevard interchange in the city of St. Louis. These two corridors are not only the most significant in the eastern portion of St. Louis County and the west/central portion of the city of St. Louis, but are also of great importance regionally, providing the principal access to a number of major activity centers, including the St. Louis CBD, the Clayton CBD, the Airport, Forest Park, and the Barnes-Jewish-Children's hospital complex, among others. The relationship of these two corridors to the rest of the St. Louis region is shown in Figure 1-1 on the following page, and Figure 1-2 shows the study area in more detail.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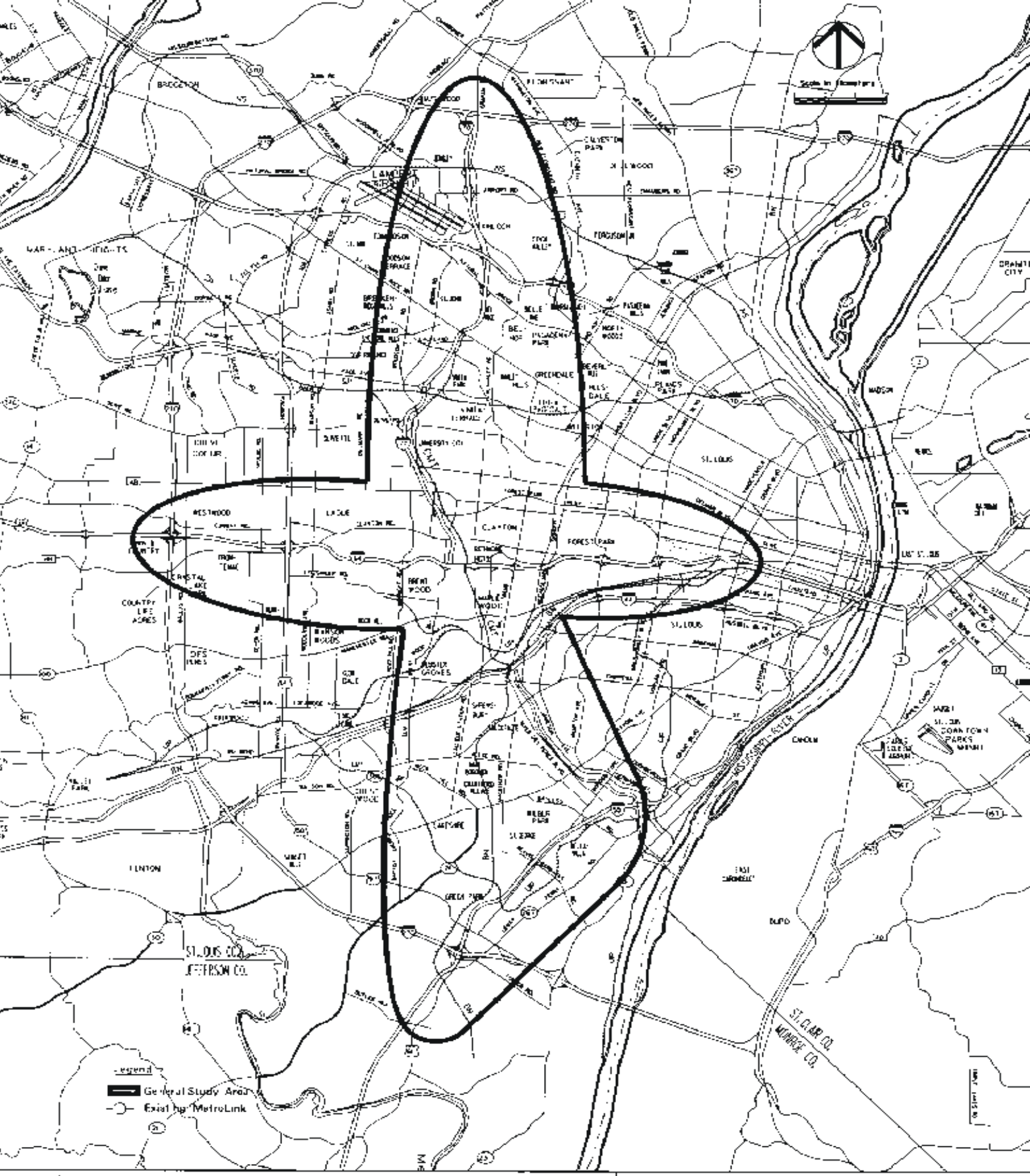



MTIA

Cross-County Corridor MTIA

Cross-County Corridor
Study Area

CIVIL INC

Figure: 2

### 1.2.3 Sponsoring Agencies

This study was a cooperative effort of the Missouri Department of Transportation (MoDOT), the East-West Gateway Coordinating Council (EWGCC), and the Bi-State Development Agency (BSDA). Day-to-day management and review of the technical aspects of the study were provided jointly by project managers from MoDOT and EWGCC.

### 1.2.4 Study Management Group

At a policy level, the study was performed under the direction of the Study Management Group. This group was formed by the three sponsoring agencies at the outset of the study, and it was their responsibility to review the major findings of the study and make recommendations to the East-West Gateway Coordinating Council Board of Directors for their implementation. The Study Management Group met at critical decision points throughout the course of the study and reviewed and approved the major study products.

The Study Management Group agencies and their official representatives for this study are presented in the following table:

| Agency | Representative |
|---|---|
| St. Louis County | Lawrence Mooney |
| City of St. Louis | Ruby Bonner |
| St. Louis County Municipal League | Tim Fischesser |
| Citizens for Modern Transit | Tom Shrout |
| Regional Commerce and Growth Association | James Farrell |
| East-West Gateway Coordinating Council | Les Sterman |
| Bi-State Development Agency | John K. Leary |
| Missouri Department of Transportation | Freeman McCullah |
| Missouri Department of Natural Resources | David Shorr |
| Federal Highway Administration | Gerald Reihsen |
| Federal Transit Administration (ex officio) | Lee Waddleton |
| Environmental Protection Agency | Dewayne Knott |

### 1.2.5 Study Process

The MTIA study process has been structured in two phases. The initial phase consists of five principal tasks: Task 1, Public Involvement Plan; Task 2, Problem Definition; Task 3, Project Scoping; Task 4, Detailed Definition of Alternatives; and Task 5, Development of Evaluation Methodologies. Phase 2 of the study consists of two tasks: Task 6, Evaluation and Comparison of Alternatives; and Task 7, Major Transportation Investment Analysis Report. Phase 2 also includes continuation of Task 1, On-going Public Involvement. Upon completion of the MTIA, a detailed environmental analysis to satisfy the requirements of the National Environmental Policy Act will be prepared, where applicable, for those alternatives which proceed to the next phase of project development.

The public involvement plan developed for Phase I was intended to outline a general approach for the active solicitation of public input on identifying transportation and transportation-related problems, and possible solutions to those problems. The plan, developed by the Public Involvement Management Committee (PIMC) outlined the goals and objectives of the public involvement program. The PIMC was established to direct the day-to-day activities of the program and included representatives of EWGCC, MoDOT and the Consultant. Public involvement tools which could be used to reach the goals and objectives of the program were suggested, although the intent was to execute a program which could be flexible and adjusted if needed.

Public scoping meetings, complemented by targeted outreach meetings with key elected officials and their staffs, major institutions and employment centers, and other stakeholders in the study area provided the study team with a broad sense of the problems and issues which needed to be addressed.

The purpose of the problem identification and public scoping tasks was to identify, document, and obtain the consensus of local decision-makers on the major problems to be addressed and the important public issues relating to those problems. The problem identification task was particularly important, as it was used as the focus for development of both the conceptual solutions and the methodologies for evaluating the effectiveness of those alternative solutions.

In the definition of alternatives, a broad range of conceptual transportation alternatives was first developed to address the identified problems and issues. This universe of alternatives - covering a wide variety of modal options - was then tailored to the specific conditions within each of the four subcorridors - north, south, east and west - of the overall study area. These potential alternatives were then screened, and only those best addressing the transportation problems in the particular subcorridor were advanced to the next level of analysis. This next step consisted of grouping the discrete strategies into single- and multi-modal combinations that most logically addressed the particular conditions and problems in the respective subcorridors. These resulting combinations of strategies, referred to as strategy sets, were then evaluated against criteria reflecting the identified problems in each subcorridor. Those best addressing the evaluation criteria were then recommended to the Study Management Group for advancement to Phase 2 of the study.

The final task of Phase 1 of the study consisted of developing the methodologies for evaluating social, economic, and environmental impacts, for developing travel demand forecasts and evaluating transportation impacts, for preparing cost estimates, for financial feasibility analysis, and for the comparative evaluation of alternatives. These methodology reports are discussed in more detail in Section 2 of this document.
Phase 2 of the MTIA was initiated upon Study Management Group (SMG) approval of a set of transportation strategies in each of the four subcorridors following an SMG meeting at the end of May, 1996. Phase 2 consisted of two tasks, Task 6 - Evaluation and Comparison of Alternatives, and Task 7 - MTIA Report. In Task 6, conceptual alternatives for each strategy set were developed in sufficient detail to allow quantification of costs, transportation effects and significant environmental impacts. Task 7 involved preparation of a summary of the public involvement program and the preparation of this document, the MTIA Report. Further details of the Phase 2 tasks are contained in Sections 3 through 7 of this report.

The MTIA study concluded with SMG recommendations to the East-West Gateway Coordinating Council Board of Directors of the scope and design concept of transportation strategies to be advanced to the next phase of project development.

# 2.0 SUMMARY OF PHASE 1

## 2.1 PROBLEM IDENTIFICATION

By design, the problem identification stage was the most important element of the Cross-County Corridor study. Only in light of the identified problems were the conceptual solutions developed, and the evaluation and screening of those conceptual strategies were performed using criteria based on those problems.

### 2.1.1 Process

To identify transportation problems in the Cross-County Corridor, three primary approaches were pursued. These were: technical analyses of existing data by the consultant team; interviews and meetings with key government agencies, institutions, local officials, and public groups; and an extensive public scoping process, including a meeting for all elected officials in the study area, a meeting with technical representatives of local communities, agencies, and institutions, and three open-house meetings for the general public. Over three hundred persons took part in this public scoping process. Combined, these findings present an overall profile of the corridor and provide a basis for developing solutions to its transportation problems and issues.

### 2.1.2 Specific Problems Identified

Major areas of concern or problems fit into four categories: community viability, congestion, access and mobility. In addition, there are numerous issues which surfaced that cut across the four problem categories and need to be given careful consideration; these are: neighborhoods, equity, financial capacity, safety and security, air quality, and other environmental issues. These major problems areas and the associated issues/considerations are summarized below.

*Community Viability*:
Much of the study area consists of the older, inner ring of suburbs. The general trend of suburbanization throughout this multi-county region over the past fifty years has resulted in a decrease in population and businesses in many of these close-in communities. These decreases have a dramatic impact on the tax base of these older neighborhoods which ultimately results in a general decline of their economic vitality, particularly in the eastern and northern portions of the study area. While there certainly are exceptions to this out-migration phenomenon on the business side (e.g. the Galleria, South County Center and immediate environs, Clayton, and shopping plazas such as at Deer Creek), the "mom & pop" stores, chain grocery stores, and professional businesses historically found in the older communities are becoming scarcer. Although some of this business economy decline within these communities can be traced to evolving business economics that have fostered super stores, multi-anchor store malls, and the like, there is also a direct connection to changing spatial distribution and demographics of the population.

The rationale of historically residential suburbs such as Brentwood to seek redevelopment opportunities is applicable across the majority of the municipalities in the corridor. As indicated earlier, these types of communities have and continue to experience declining tax bases, and increasing costs to provide basic services. In the absence of existing undeveloped land to attract investors with higher tax generating land uses, many communities will find it difficult to resist redeveloping older, residential and/or storefront commercial tracts.

Investment or reinvestment in transportation facilities should then take into consideration their ability to induce new development in the inner, older suburbs, as investments in these facilities can strongly affect land use patterns, population and/or business densities, and building prices. Accessibility is certainly key to both residential and commercial interests in determining a viable location for development. For example, at least five major developments are proposed near the Hwy. 40/I-170 interchange by the cities of Clayton, Richmond Heights, and Brentwood along Brentwood Boulevard from Clayton Road to just south of Eager Road. These developments alone would add well in excess of a million square feet of new retail, hotel, and entertainment uses. Planning for each of the projects mentioned above, however, is proceeding independently within the three municipalities, with no jurisdiction having the overall authority to coordinate the planning or oversee the development approval process. In terms of transportation demands, local streets and arterials that generally satisfied the previous low-density development will now be called upon to handle greater traffic demands; so too may other public services be overburdened (e.g., water, sewer, fire and police protection). The combined traffic effects of these projects have not been analyzed by any jurisdiction, but could certainly exacerbate the currently congested conditions.

*Congestion*:
Another effect of the urban and suburban sprawl that has resulted from the migration to newer and more distant, lower density of development suburbs has been a broad dispersal of the origins and destinations of trips, leading to much longer average trip lengths and difficulty of serving those trips with conventional fixed route bus transit. The increased availability of autos and increases in the number of two-worker and single-adult households have also contributed to significant increases in the number of single-occupant-vehicle auto trips throughout the region. Longer trip lengths lead drivers to favor the higher-speed principal arterials and interstate highways, thereby creating demands in excess of the design capacities of these existing roadways during peak periods.

Congestion on interstates, principal arterials, and collector roads can contribute to increased travel times, worsening air pollution, higher accident rates with corresponding increased property damages and bodily injury incidents, and psychological impacts on commuters that researchers indicate negatively impacts upon worker productivity. The freight hauling industry, and the smaller parcel service in particular, can be severely impacted by congested roadways that make truck movements difficult and delivery/hauling times hard to predict or schedule.

Significant congestion occurs along the entire length of Hwy. 40 (I-64) in the study area, along the southern portions of I-170, at the northern I-170 interchange with I-270, and at most of the major intersections along the principal arterials in the southern leg of the corridor - Brentwood Boulevard, Elm Avenue, Laclede Station Road, and McCausland, for example.

The single location cited most frequently as a congestion problem is the interchange of Hwy. 40 (I-64) and I-170. The lack of direct connections for all interstate-to-interstate movements and the proximity of adjacent interchanges (that were not designed for the current traffic volumes) create major impediments to smooth traffic flow.
In Forest Park, all of the major institutions (Art Museum, Science Center, Muny Opera, Museum of History, and the Zoo) identified significant access, congestion, and traffic and pedestrian safety problems. The Hampton Avenue interchange with Hwy. 40 (I-64) has been identified as the greatest congestion problem, followed by the Kingshighway interchange, the intersection of Wells and Skinker, and the McCausland interchange with Hwy. 40 (I-64) at the southwest corner of the Park. Potential park-related developments at the Arena site on the south side of Oakland Avenue will add to the existing congestion. Growth in employment and visitation at the adjacent Barnes-Jewish-Children's (BJC) hospital complex have resulted in complete saturation of the Kingshighway/Hwy. 40 (I-64) interchange during peak periods. And while congestion was identified as a specific problem area in its own right, congestion along Interstates and major arterials is seen as a detriment to the viability of the city of St. Louis and many of the municipalities within the corridor. There is widespread concern - and evidence from around the country to validate such concern - that congestion may cause employment to follow the suburbanization trends.

*Access*:
The central east-west corridor of both this study area and of the St. Louis region contains a major concentration of key metropolitan activity centers and employment centers. The County Government Center and Clayton central business district, the Barnes/Jewish/Children's hospital complex, Forest Park and its major institutions, Washington University, St. Louis University, Forest Park Community College, and the Galleria and Plaza Frontenac shopping centers all lie within this central corridor, and all are facing access and parking problems.

The great majority of visitors access Forest Park by auto. The recently-approved Forest Park Master Plan seeks to reduce the area of the park devoted to the automobile, better manage auto access and parking, and allows for the expansion of the major institutions, provided there is no net loss of open, green space. Meeting these goals while accommodating the increasing usage predicted by all of the Park's major institutions is problematic for the existing transportation system. In this regard, the Master Plan endorses increased service on an expansion of rail transit.

Increased traffic to the BJC hospital complex has necessitated the construction of several major parking structures along the eastern side of the complex, thereby inducing traffic on local streets through the complex, as well as requiring conversion of a portion of the moderate-income housing in that neighborhood. A significant number of

employees and visitors to the hospital complex are using the eastern end of Forest Park for parking. The hospital complex is also served by the existing Central West End MetroLink station, but the significant amount of bus traffic generated at the station for patron access/egress causes severe congestion on Euclid Avenue in the heart of the hospital complex.

The three campuses of Washington University (Medical Center, Hilltop, and Clayton) have problems providing parking for all persons attempting to access the facilities by auto, and in providing convenient transportation from off-campus housing, and for students and staff traveling between the campuses for the hundreds of trips that occur each day. The university is landlocked, with very little space available for their future expansion plans. Students seeking to avoid on-campus parking fees are using the west end of Forest Park for parking for several hundred autos each day, creating parking conflicts with Park users; implementation of the Park Master Plan may effectively eliminate even the possible use of this area for parking in the future.

In the south County portion of the study area, local officials, planners, and the general public have noted that the area suffers from a lack of freeway-type service providing a north-south connection to the center of the study area and destinations north of Hwy. 40 (I-64). Total north-south travel demand in this part of the corridor - estimated at some 200,000 trips per day - is currently carried on several principal arterials. Travel time studies show that north-south travel in this leg of the corridor is significantly slower than comparable trips in other legs of the study area. Here again, while accessibility is seen as a specific problem, it is also believed to be directly related to community viability. Sustaining current development as well as attracting new development - particularly residential development - is thought to be closely linked to an area's accessibility to the widest array of travel desires.

*Mobility*:
Throughout the entire study area there is a perceived lack of viable alternatives to the private automobile. This limits the choices for those with access to an auto, and is a very significant adverse impact on those for whom the automobile may not be a viable option, such as the elderly, the disabled, youths, and low-income persons. For those reliant on public transportation, travel times are some two to three times longer than for comparable trips by auto. In many of the outlying segments of the study area, a significant number of the households are not located within convenient walking distance of regularly-scheduled transit service.

In the center of the study area, public officials and major institutions have cited the need for a high-level-of-service alternative to the automobile to connect major activity centers. Both the mayor's office of the city of St. Louis and the city of Clayton have emphasized the need for a direct high-speed transit link between downtown St. Louis and the Clayton, and Clayton has also indicated a similar need for a direct connection to Lambert-St. Louis International Airport.

*Issues/Considerations*:
In the course of identifying these transportation problems in the Cross-County Corridor, a number of issues of major concern to the public, government and institutional officials were brought to the attention of the study team. Resolution of these issues will greatly enhance the acceptability of any conceptual strategies developed to address the problems. The principal concerns identified in the scoping process are discussed below:
Neighborhoods - The public throughout the entire study area is very concerned about any potential impacts to neighborhoods, communities, and parks, particularly Forest Park. There will be strong public opposition to any strategies that sever existing neighborhoods or disrupt communities or parks through extensive right-of-way acquisitions. Communities and school districts were also concerned about any losses of residents or students due to required relocations. The effect on the real estate values of properties adjacent to new transportation facilities was also a concern expressed frequently.

Equity - A consideration in evaluation of the conceptual transportation solution strategies will be how the costs or impacts and the benefits of each alternative are distributed among the various socio-demographic groups within the study area, and between groups within and without the study area. Affordable housing for displaced residents will also be a consideration.

Financial Capacity - Great concern was expressed over the ability of the region to fund any proposed transportation solutions in this corridor, and what effect that commitment of public funding would have on the ability of the region to pay for transportation projects elsewhere in the region, as well as pay for other critical infrastructure needs. The uncertainties associated with future federal and state funding, both in absolute terms and relative to the different transportation modes, must be considered in the decision-making process.

Safety and Security - Each of the solution strategies will have to be responsive to the existing traffic safety problems perceived in the corridor. Security issues affect the travel choices for some of the populace and will need to be a consideration in the design of transportation solutions.

Air Quality - Concern about the quality of the region's air was identified through the scoping process as one of the most widely held values. Since only strategies that conform to the State Implementation Plan for achieving the region's air quality goals can be adopted, these concerns should be accommodated.

Noise - Consideration of the direct noise impacts on adjacent neighborhoods from various transportation strategies should be a priority.

Detailed descriptions of each of the above problem areas and issues were presented in TM- 2, Problem Definition.

## P2.2 PUBLIC INVOLVEMENT

Phase 1 public involvement activities were aimed at providing avenues by which the study team could gain a better understanding of the problems within the Cross-County Corridor, and to gain this information from the perspective of the many publics which have an interest in this corridor. Public involvement activities during Phase 1 included: developing a broad-based database; set-up and administration of a study "hotline"; execution of five scoping meetings; and implementation of a corridor outreach program to supplement the scoping meetings.

### 2.2.1 Public Scoping Meetings

As indicated above, five scoping meetings were conducted to receive input and to begin the discussion of the problems and issues in the Cross-County Corridor. The first was held for elected officials, the second was to receive input from governmental, organizational, and business interests, and three open house meetings were held for the general public. More than three hundred individuals participated in this process. A video was prepared and shown at each of the meetings outlining how a Major Transportation Investment Analysis is conducted, specifics on the Cross-County Corridor MTIA, and direction on how individuals could be involved in the process. While some technical information was presented (travel times within the corridor, accident rates, employment trends), the displays were focused on engaging the public into discussion about what values are important to them and what was the root of the problems they discussed, and how transportation issues impact their lives.

A questionnaire was developed for those attending the scoping meetings to elicit information about respondents' perceptions of transportation problems in the Cross-County area, as well as to identify some underlying values of the respondents and how they perceive transportation and its place in the community. One-hundred ninety-seven people completed the surveys including nine (9) at the elected officials meeting, seven (7) at the key governmental, institutional and technical meeting, and 181 at the general scoping meetings. Major findings of the survey and more detailed information on the scoping meetings can be found in two documents: Technical Memorandum No. 3C -Scoping Report, and the Public Involvement Summary Report.

### 2.2.2 Community Outreach Meetings

A corridor outreach program was implemented to complement the scoping process. The study team targeted key transportation generators within the corridor in order to get a broad sense of the problems and needs within the Cross-County Corridor. From August 1995 through June 1996, study team members met with nearly 700 individuals representing major employers, educational institutions, governmental agencies, citizen's groups, developers and municipalities, each of whom has a vested interest in the results of this study.

As with the larger scoping meetings, these meetings were intended to solicit specific information from these representatives about the transportation problems that may exist for their particular agency/institution/organization. Information gathered from these meetings included origin-destination statistics from major employers and attractions,

current and proposed development plans with relevance to the study, planned expansion of facilities, environmental concerns, and individual municipality master plans.

Beyond statistical information being brought to the study, these meetings provided a unique look into the future transportation needs in these corridors and afforded the study team a larger picture of problems within the Cross-County Corridor.

### 2.2.3 Newsletters

Since the beginning of the study over 1,300 people and organizations have been added to the study mailing list database. Many on the list represent organizations, such as chambers of commerce, which then pass the information along to their members. Information disseminated by the study team, including newsletter updates, provided information about the study "hotline" as an avenue for the public to provide comments to the study team or request to be added to the mailing list. Updates were distributed at key times throughout the process, and at the end of the MTIA, the database was provided to the client for issuance of future updates by MoDOT, relative to roadway improvements and, BSDA for transit projects.

## 2.3 DEVELOPMENT OF STUDY TECHNICAL MEMORANDA

### 2.3.1 Purpose

Concurrent with the problem identification and public involvement processes, the study team developed a series of technical memoranda to define in more detail the conduct of the later stages of the study, technical criteria relating to the specific solution strategies, and the various methodologies that would be employed to evaluate those solution strategies.

### 2.3.2 Specific Topics Addressed

The first of these was the ***Detailed Work Plan, TM-3B***, which detailed the specific steps to be carried out in developing and evaluating the conceptual strategies. The key physical parameters necessary to adequately define the conceptual strategies under consideration were identified in ***TM-4A, Physical Design Standards***. This document defined the specific design criteria and standards that would be used in the development of the various modal strategies to be developed, which included highway, busway, light rail transit, and TSM strategies. The particular major policy, institutional, and financial factors that could affect the implementation of any of the conceptual strategies were identified in ***TM-4C, Policy, Institutional, and Financial Framework***. A variety of technical memoranda were also developed to define the methodologies that would be employed in the later stages of the study to evaluate the alternative strategies under consideration. These methodologies have been based on previous FTA and FHWA guidance for the preparation of ***Transit Alternatives Analysis/DEIS*** and ***Highway Corridor Studies/EIS***, but have been specifically tailored for this study to reflect the multi-modal nature of the alternatives and the reduced level of detail necessary to support a major investment study decision. The methodology reports prepared included:

- TM-5A Social, Economic, and Environmental Assessment Methods
- TM-5B,C, D Capital, Operating and Maintenance, and Life Cycle Cost Estimation Methods
- TM-5E Travel Demand Forecasting and Transportation Impact Methods
- TM-5F Financial Analysis Methods

These methodology reports were reviewed and approved by the client study managers. A complete listing of all Technical Memoranda prepared as a part of this study is contained in Appendix A at the rear of this document.

## 2.4 STRATEGIES RECOMMENDED FOR FURTHER STUDY IN PHASE II

### 2.4.1 Strategy Development

Through the process of identification and analysis of the transportation-related problems in the Cross-County Corridor study area, it was determined that a subdivision of the study area into four subcorridors would facilitate the development and evaluation of solutions. North, South, East, and West subcorridors were delineated, each sharing a common terminus at the junction of I-170 with I-64. (Although common to all four subcorridors, this interchange was classified to the East subcorridor for purposes of evaluation.)

To address the problems in the four subcorridors, a broad range of transportation solutions was identified. This array of alternatives was selected to address the specific problems and conditions extant in the study area. These conceptual transportation strategies consisted of the following measures:

-- Transportation System Management
-- Reconstruct Interstate Highway Interchanges
-- New Highways on New Alignment
-- Add Highway Lanes
-- Add High-Occupancy Vehicle Lanes
-- Add Arterial Street Lanes
-- Rail Transit
-- Busway

There was also significant public interest expressed in improving bicycle and pedestrian facilities. For each of the above strategies that involve linear corridor improvements, efforts will be devoted to incorporating facilities for pedestrian and bicycle movement in the actual design of the preferred alternative to be approved by the East-West Gateway Board of Directors. These may include paved trails along new rights of way or in widened existing rights of way, and provisions for pedestrian and bicycle access across any new corridors.

The next steps in the process were to review these conceptual strategies for applicability within the specific subcorridors, combine the strategies - where appropriate - into multimodal solution sets, and tailor these single-mode or multimodal strategies to accommodate the particular conditions within each of the specific subcorridors.

Descriptions of the location and physical characteristics, operating characteristics, service parameters, and potential impacts associated with these strategy sets within each of the four subcorridors were presented in ***Technical Memorandum No. 3A,Conceptual Definition of Alternatives***.

### 2.4.2 Evaluation Process

A comprehensive set of evaluation criteria were developed to assess how each of the conceptual transportation strategies addressed the identified problems and issues within each subcorridor. A qualitative, graduated rating system was prepared for each evaluation criterion that measured how well (or poorly) an individual strategy set addressed or resolved a subcorridor issue or problem. The evaluation criteria associated with each of the major identified problem areas and issues are as follows:

-- Community Viability
- Supports existing or planned land uses
- Reduces through-traffic in residential areas
- Supports pedestrian/bicycle-friendly environment
- Enhances existing and planned business centers
- Fosters redevelopment of underutilized areas
- Increases existing community tax base
- Requires little or no business and residential displacements

-- Traffic Congestion
- Improves the efficiency of traffic operations
- Reduces single-occupancy vehicle trips
I- ncreases corridor capacity

– Accessibility
- Improves connectivity to major destinations
- Provides enhanced access to regional transportation network
- Improves travel times

– Mobility
- Offers more transportation options to major destinations
- Improves availability of services for the transportation disadvantaged

-- Neighborhood Concerns
- Avoids residential neighborhood encroachment
- Does not create barriers within or between neighborhoods
- Reduces traffic through residential neighborhoods
- Consistent with neighborhood aesthetics

-- Equity
- Equitably distributes costs and benefits
- Places fewer impacts on disadvantaged groups

-- Safety and Security
  - Reduces the number of accidents
  - Improves travelers' sense of security

-- Noise
  - Minimizes effects of noise in sensitive areas

-- Regional Viability
  - Enhances viability of core business areas
  - Improves regional air quality

-- Transportation System Development
  - Ability to pay for implementation
  - Produces system-wide travel benefits

Application of the above evaluation criteria to the list of conceptual transportation strategies within each of the four subcorridors indicated that a number of the strategies were generally inferior in a majority of the individual criteria categories. These conceptual strategies were therefore recommended to be dropped from further consideration within the specific subcorridor, while those found to generally be more effective in addressing the identified problems were recommended to the Study Management Group to be carried into Phase II of the study for further analysis.

**2.4.3 Study Management Group Review and Approval**

Preliminary strategy recommendations for Phase II analysis were contained in the document Transportation Strategy Recommendations, which was presented to the Study Management Group on May 30, 1996, for their review and comment. As a result of the meeting, some strategy set additions and deletions were made, and the revisedTransportation Strategy Recommendations (June 5, 1996) incorporated these changes. The strategies advanced to Phase II are presented in the next section, and were described in detail in TM-4D, Detailed Definition of Alternatives.

Among the strategies not recommended for more detailed study at this time was rail transit in the West subcorridor. The East-West Gateway Coordinating Council and the Missouri Department of Transportation intend to initiate a Major Transportation Investment Analysis in the short-term future to investigate multimodal transportation solutions in the longer I-64 corridor from I-170 westward to the vicinity of MO 340 in Chesterfield. It was determined that this future study should be the one to address the full range of modal options and combinations to improve transportation service in this corridor. For this reason, and with the concurrence of the Cross-County Corridor Study Management Group, the scope of the Cross-County Corridor MTIA was limited to only highway mode solutions in the West subcorridor, with the understanding that any highway solutions recommended for implementation will allow future development of alignments for fixed-guideway transit modes within the I-64 corridor without the need for significant reconstruction.

### 2.4.4 Phase 1 Strategies Advanced for Further Study

A total of 19 strategies, seven in the North subcorridor, six in the South subcorridor, and three each in the East and West subcorridors, were recommended for more detailed analysis in Phase 2 of the study. These strategies are:

- ***North Subcorridor***
  - TSM
  - Reconstruct Interstate Interchanges
  - Add Interstate Highway Lanes
  - Add Interstate HOV Lanes
  - Rail Transit Extension
  - Add Interstate Highway Lanes and Rail Transit Extension
  - Add Interstate HOV Lanes and Rail Transit Extension

- ***South Subcorridor***
  - TSM
  - Add New Interstate Highway or Parkway
  - Rail Transit Extension
  - Add New Highway and Rail Transit Extension
  - Add New Highway and HOV Lanes
  - Add New Highway with HOV Lanes and Rail Transit Extension

- ***East Subcorridor***
  - TSM
  - Reconstruct Interstate Interchanges
  - Rail Transit Extension

- ***West Subcorridor***
  - TSM
  - Reconstruct Interstate Interchanges
  - Add New Interstate Highway Lanes

# 3.0 PHASE 2 CONCEPTUAL ENGINEERING

## 3.1 SPECIFIC STRATEGIES

The Study Management Group, through their action on the consultant's Transportation Strategy Recommendations of May 30, 1996, determined the specific transportation strategies to be advanced into the Phase 2 analysis. These specific strategies were listed at the end of the preceding section. Conceptual engineering for each of these individual strategies was then initiated to develop details necessary for further analysis of the strategies.

## 3.2 LEVEL OF DETAIL

As applied in this study, the Major Transportation Investment Analysis (MTIA) is a new planning and analysis tool that precedes preliminary engineering and NEPA environmental impact statement preparation in the project development process. The MTIA is intended to provide regional leaders with sufficient information to allow them to decide on the scope of major transportation investments and general design/service concepts within the corridor. The MTIA is not intended to provide the basis for precise location decisions among a variety of alternative alignments within the same corridor, nor about exact design or operational details of a particular concept. The conceptual engineering for each of the above specific transportation strategies was developed in sufficient detail for representative alignments to allow order-of-magnitude estimates of cost, transportation, economic and environmental impacts.

### 3.2.1 Mapping

Base mapping for this study consisted of controlled aerial photography of the study area and vicinity flown in March, 1994. In specific areas where significant new development has occurred since the photography was obtained, more recent aerial photography (March, 1996) was obtained and merged into the existing base photograph. These updated areas included the I-170 Business Park north of St. Charles Rock Road, the Sunnen Business Park along Big Bend, the I-270 / I-55 interchange, and the area immediately east of the Barnes-Jewish-Children's Hospital Complex.

### 3.2.2 Profile/Grade Information

Detailed topographic information was not obtained specifically for this study, and precise profiles of all of the alternative alignments have not been developed. Sufficient topographic information was obtained to allow a general determination of whether the representative alignment was at-, below-, or above-grade. In particular areas where more precise information was needed to more fully assess and represent the viability of a specific alignment, or to identify significant cost elements, detailed topographic mapping from the St. Louis Metropolitan Sewer District or other sources was consulted.

### 3.2.3 Exhibits

Mapping of each of the discrete and the multi modal strategies developed for the Cross-County Corridor MTIA is presented in the MTIA Report Exhibits document, bound separately, and accompanying this document. These exhibits present the strategies by subcorridor, in the order north, south, east, and west. Within the subcorridors, they are presented in the order shown in the listing above, generally beginning with highway strategies, then rail strategies, and finally multi-modal strategies. The exhibits are presented at a scale of 1 inch equals 400 feet.

In all cases, the precise alignment shown is meant only to be representative of a general concept, and serves only as the basis for estimates of cost and environmental impact. A wide variety of location alternatives may be investigated in much greater detail for any of the strategies recommended for further investigation in the next phase of project.

Each of the discrete strategies is intended to incorporate a significant emphasis on pedestrian and bicycle access. Because of the scale of the mapping and the generally limited "footprint" of such facilities, details of those facilities are not included in these exhibits. The level of detail to be presented in the future Phase III of the study will allow such facilities to be shown in the plans. Note also that all new transit centers and rail transit stations are intended to provide a significantly enhanced level of information services for travelers. Again, the physical impact of such facilities is not major, and is not evident at the scale of these exhibits. Capital cost estimates have included provision for their inclusion wherever appropriate.

# 4.0 PHASE 2 PUBLIC INVOLVEMENT

From July, 1996 through December, 1996 the public involvement activities were focused on continuing the "corridor outreach" program in conjunction with the study team developing conceptual designs, updating the "publics" on these conceptual designs, gaining feedback, and testing the reaction of the general public to these concepts.

Public involvement tools used in this phase focused on the general strategies and providing this information via a comprehensive newsletter and obtaining feedback; the development and analysis of a survey which was placed at locations throughout the study area to gain reaction on how well the strategies responded to the problems and issues identified; corridor outreach continued, and based on comments from the various publics, adjustments were made to strategies if appropriate; work with elected officials was heightened during this time in order to receive feedback on how they felt their constituencies would react to the strategies under consideration; and finally, after a great deal of public discussion and news coverage on the various strategies, a public open house meeting was held to provide information and to receive comments on the strategy sets to be recommended for further study in Phase 3.
While the following sections provide an overview of some of these activities, more detailed information on public involvement during Phase 2 is contained in the document ***Public Involvement Summary Report***.

## 4.1 COMMUNITY OUTREACH MEETINGS

Corridor outreach meetings continued into Phase 2 from July, 1996 through January, 1997. The role of public involvement during this time was to not only provide the information to the public about specific strategies under consideration, but to make them aware of who would be making the decisions and how the public could get their views heard.

With this in mind, an important public involvement activity during Phase 2 focused on reviewing the strategies with various stakeholders through corridor outreach meetings, refining them where appropriate, and informing the public of the process to move the Cross-County Corridor into Phase 3. The study team met with many of those individuals and/or representatives who identified specific problems during the first Phase in order to get a sense of whether or not it was felt the problems were addressed. As the conceptual solutions were developed, additional potentially affected parties were identified and consulted. These meetings provided a vehicle by which to raise concerns or issues relating to the conceptual designs for any of the modes or combinations. Conceptual designs were revisited to determine if adjustments could be made without compromising the overall intent of the overall design.

Approximately 500 individual stakeholders participated in corridor outreach meetings during Phase 2 including environmental representatives, key institutions and employers, hospitals, shopping malls, and neighborhood organizations. During this time frame, the study team also spent a great deal of time meeting and working with elected officials and their staffs as the representatives of the many neighborhoods and communities in the corridor. Special attention was placed on coordination with the seven municipalities most likely affected by the study results: Brentwood, Richmond Heights, Clayton, University City, Maplewood, Shrewsbury and Webster Groves. Several meetings were held with this group of municipalities both as a whole, and individually.

## 4.2 NEWSLETTERS

At the beginning of Phase 2 (July, 1996) over 1,000 newsletters were mailed which: presented the problems and issues identified in Phase 2; outlined in great detail the activities of Phase 1 with particular focus being placed on the screening process; discussed the general strategies developed to address the problems identified; explained what strategies had been determined to be carried forward for further evaluation, which were eliminated by the Study Management Group from further consideration, and why. The St. Louis Post-Dispatch also placed this newsletter on their web site, *POSTnet*, for access on the Internet.

A second update was distributed in November, 1996, explaining the decision-making process for determining which of the strategies would be carried into Phase 3 for more detailed analysis. A news release was also sent to the entire mailing list in December, 1996, announcing a public open house scheduled for January whereby stakeholders could review the strategies under consideration by the decision-makers.

## 4.3 PUBLIC OPINION SURVEY

In August, 1996, a survey was conducted on behalf of the study to obtain further input from the public. Specifically, the study team was interested in obtaining information on what issues relating to transportation solutions in this corridor are important to residents and travelers throughout this corridor, and to get a sense of how the public feels about the conceptual strategies now under consideration. It was not intended to be a "vote" on the strategies under consideration. Rather, it was aimed at soliciting better insight into the public's attitude about issues relating to those strategies and what role transportation plays in their everyday life. The survey was conducted on behalf of the study by the Dohring Company of Glendale, California, and administered by the Orca Partnership of St. Louis. The questionnaire, raw data and a more detailed analysis is provided in the document Public Involvement Summary Report. An overview of the results is contained in the following sections.

### 4.3.1Administration of Survey

The survey was administered throughout the St. Louis Cross-County Corridor using TRENDTRAK, an electronic intercept survey system. Survey devices were placed at 25 locations throughout the corridor, and passers-by were invited to answer questions

about transportation issues and solutions. There was an average of 49.44 completed surveys at each site.

The study area was divided into four subcorridors -- north, south, east and west--and the devices were placed in locations to insure a representative sample in each of the four subcorridors. The types of locations chosen were grocery stores, educational institutions, pharmacies, major employment centers, hospitals, shopping malls, discount stores and fast food establishments.

**4.3.2 Respondent Profile**

Respondents generally presented a reasonable distribution of the corridor population on the demographics collected, namely -- gender, age, home ownership, subcorridor of residence, subcorridor in which the respondent most frequently traveled, mode of transportation primarily used, and average commuting time.

Key elements of the sample include:

-- The subcorridor most frequently traveled by the respondents is: north, 23%; south, 23%; east, 27%; west, 23%; other, 3%.

-- The respondents are residents of the subcorridors as follows: north, 19%; south, 31%; east, 25%; west, 14%; non-residents of the corridor (some commuters and visitors) represent 12% of the sample.

-- 74% of respondents drive alone to work; 6% participate in a car pool; 6% travel by bus and 5% use MetroLink. There were few significant differences among residents or travelers in the four subcorridors with regard to mode of travel.

-- Twenty minutes is the average travel time of 70% of the respondents; over 90% commute an average of 40 minutes or less. Respondents who drive alone have the shortest one-way commuting time. 75% of those who drive alone commute 20 minutes or less compared to 57% of car-poolers, 40% of MetroLink riders, and 39% of bus riders. 9% of all respondents commute one hour or more.

-- The average age of respondents is 42.6 years. In general, the older the respondent, the more likely he/she is to drive alone. 81% of those 65 or older drive alone, while only 64% of respondents in the 18 to 24 age category do so.

**4.3.3 Overall Summary: Key Values**

Several key findings which held among all groups are of particular interest:

-- Transportation is an important issue to travelers within the Cross-County Corridor. Over 78% of respondents indicated that compared to other issues, transportation is very important (53%) or important(25%) to them.

-- Air quality is a critical issue to cross-county travelers in forging any solution to transportation problems. An overwhelming majority of respondents (85%) strongly agreed (59%) or agreed (26%) with the statement, "Transportation solutions must contribute to air quality."

-- A majority of the sample (54%) said that some residential displacements would be acceptable. Generally speaking, these percentages were similar for all groups in the survey.

-- Openness to the possibility of business displacements followed a generally similar pattern to attitudes on residential displacements, with business displacements being generally more acceptable across the board. 59% of those surveyed said that some displacement of businesses would be acceptable. When these respondents were questioned about how strongly they agreed with this position, a full 80% strongly agreed or agreed that some displacement of businesses would be acceptable.

-- Preservation of park land is an important issue. 50% of those sampled strongly agreed, agreed or somewhat agreed that some reduction of park land would be acceptable. There were some differences in their percentages by subcorridor. In the north, 56% agreed; south, 49%; east, 42%; west 58%.

-- Neighborhood integrity is also important, though not as strongly held a value. 58% of respondents found transportation projects that limit access within communities acceptable; 15% of respondents strongly agreed, 19% agreed and 24% only somewhat agreed with that position.

-- Noise reduction was the least supported value tested. 68% of respondents were willing to accept some increase in noise levels.

**4.3.4 Evaluating Solutions**

Respondents were asked to rank how significant seven factors were in assessing solutions to transportation problems. They were permitted to check three of the seven. Respondents chose the following as the top four:

-- significantly improves alternatives to driving (with 66% of respondents indicating this was an important factor)

-- significantly reduces accidents (58%)

-- significantly improves travel time (57%)

-- reduces auto congestion (53%).

Those responses suggest that while safety and congestion are important to cross-county residents, the development of transportation options remains a strongly held goal for many residents.

While these four choices were clearly the most significant factors for all groups, there are several things worth noting about variation in solution preference among groups.

- Significant improvements in travel time was especially important to those who estimated their commute to be one hour. 72% of this group chose that factor as important, as compared with 57% overall. Older respondents found this less important with only 43% choosing it as significant.

- Safety was also an important factor for all groups (58%), but especially important to those who had long commutes of one hour to one and one half hours (70%) and those under 18 (72%)

- Significantly improves alternatives to driving was also important to all groups (66%), but especially important to those in the 45 to 54 age group (73%).

- There was little difference across subcorridors in the significance of access to the airport. It was, however, much more important to those over 65 (33%) than the general population (16%).

- Easier to walk or bike was more important to those under 18 (34%) than the general respondent (23%).

**4.3.5 Choosing Solutions**

Respondents were presented with a list of solutions being considered for the subcorridor in which they most frequently traveled and asked to react to them. In the three areas where "improving interchanges" was offered as an option (along Highway 40 in the east and west, and along I-170 in the north) it was considered important by the highest number of respondents.

Results are displayed for all subcorridor respondents as well as for respondents who are both travelers and residents within a subcorridor. Some differences are noted.

| North Subcorridor | | |
|---|---|---|
| Solution Option | All North Respondents Choosing Very Important or Important | All North Respondents who are also North Residents Choosing Very Important or Important |
| [illegible] | [illegible] | [illegible] |
| [illegible] | [illegible] | [illegible] |
| [illegible] transit | [illegible] | [illegible] |
| [illegible] driving | [illegible] | [illegible] |
| [illegible] service from [illegible] to airport | 49.3% | 57.4% |
| [illegible] carpool lanes along I-70 | 45.5% | 51.0% |

| South Subcorridor | | |
|---|---|---|
| Solution Option | All South Respondents Choosing Very Important or Important | All South Respondents who are also South Residents Choosing Very Important or Important |
| Rail Service | 83.3% | 71.3% |
| [illegible] public transit | 84.3% | 55.3% |
| [illegible] | 84.3% | 68.3% |
| [illegible] Highway | 51.3% | 45.3% |
| Increasing costs of driving | 83.3% | 84.3% |

| East Subcorridor | | |
|---|---|---|
| Solution Option | All East Respondents Choosing Very Important or Important | All East Respondents who are also East Residents Choosing Very Important or Important |
| Improve interchanges along Hwy. 40 | 63.3% | 78.4% |
| Financial incentives for public transit | 65.7% | 80.3% |
| Rail service from Clayton to downtown | 57.3% | 65.0% |
| Increasing out-of-pocket costs for driving | 45.3% | 40.0% |

The East subcorridor showed the strongest differences between resident and non-resident travelers. For example, rail service was more strongly favored by east residents (65%) than by all east travelers (57.3%).

Interchange improvements were especially important to car-poolers; it was least popular for MetroLink riders. Generally speaking, support for this option increases with average commute time.

Financial incentives for public transit is a solution that is the most popular for MetroLink users. MetroLink users also found additional rail service appealing compared to all respondents. Bi-State bus riders also supported this option more strongly than the general population.

| West Subcorridor | | |
|---|---|---|
| Solution Option | All West Respondents Choosing Very Important or Important | All West Respondents who are also West Residents Choosing Very Important or Important |
| Improve interchanges along Hwy. 40 | 70.5% | 78.7% |
| Add lanes on Hwy. 40 from I-170 to Schoettler Rd. | 69.7% | 80.0% |
| Financial incentives for public transit | 69.0% | 65.0% |
| Increasing out-of-pocket costs for driving | 45.7% | [illegible] |

Interchange improvement options were most strongly supported by bs users, car-poolers and drive alone respondents in that order. Car-poolers and bus users were also strong supporters of the addition of lanes, as were respondents who commuted one hour or more.

# 5.0 PHASE 2 DEVELOPMENT OF ALTERNATIVE STRATEGY SETS

## 5.1 DISCRETE STRATEGIES

Section 3 of this report presented the 19 specific strategies by subcorridor which were developed in Phase 1 for detailed analysis. Through the conceptual engineering process, it became clear that some reorganization of these strategies would simplify the comparative analysis process. While none of the specific strategies were eliminated in this process, and no new ones added, they were grouped to allow more efficient evaluation. The following paragraphs discuss the reorganization of these strategies. Because many of the major components of the TSM strategy could only be implemented on a regional basis, it was determined to identify it as a single, region-wide strategy, rather than as four strategies that could be implemented in selected subcorridors of the study area.

Within the South subcorridor, it was determined that the differences in capital costs and potential impacts of the several identified options was sufficiently great that these should be identified as separate strategies rather than remaining within the original category of "new highway". The three major options identified as separate strategies were: 1) new parkway from I-64 to I-44; 2) new freeway from I-64 to I-55; and 3) new parkway extension from River Des Peres Parkway to Big Bend. It was also determined that the multimodal combination of rail transit and new freeway or parkway would have different impacts than the simple sum of the separate strategies of rail transit and new highway. A separate multimodal strategy was therefore identified for this unique option.

Further development of the strategies indicated that the costs and impacts of new HOV lanes did not differ significantly from those of adding new general purpose lanes. It was also recognized that HOV lanes would only be effective when implemented in sufficient length to provide substantial time savings to motorists. This strategy was therefore presumed to occur only when a complete north-south highway HOV system could be implemented. For those strategy sets that did not include new highway lanes in both the north and south subcorridors, the new lanes were assumed to be general purpose lanes. Because a sufficient length of new lanes would not be available in the east-west corridors, HOV lanes were not considered there.

With these changes, a new listing of strategies was developed that would comprise the basic elements of the Phase 2 evaluation. For purposes of this evaluation, these strategies are identified as "Discrete Strategies" from this point forward. The 16 Discrete Strategies evaluated are presented below.

*Regional*:
- -- TSM

*North Subcorridor*
- -- Reconstruct Interchanges
- -- Add Highway Lanes
- -- Rail Transit Extension
- -- Add Highway Lanes and Rail Transit Extension

*South Subcorridor*
- -- Add New Parkway, I-64 to I-44
- -- Add New Freeway, I-64 to I-55
- -- Add Parkway Extension, River Des Peres Parkway to Big Bend
- -- Rail Transit Extension, Clayton to I-44
- -- Rail Transit Extension, I-44 to Butler Hill Rd.
- -- Add New Parkway and Rail Transit Extension, I-64 to I-44
- -- Add New Freeway and Rail Transit Extension, I-64 to I-55

*East Subcorridor*
- -- Reconstruct Interchanges
- -- Rail Transit Extension

*West Subcorridor*
- -- Reconstruct Interchanges
- -- Add Highway Lanes

Detailed mapping of each of the Discrete Strategies (including the major options) is presented in Section A of the MTIA Report Exhibits document, bound separately, and accompanying this report.

## 5.2 RATIONALE FOR STRATEGY SETS

As one or several of the strategies could be developed in each subcorridor, and as the combination of strategies implemented in any one subcorridor could have significant effects in the other subcorridors, the number of distinct alternative scenarios that could result from all possible combinations is quite large, and is beyond the ability to clearly differentiate in this study. In order to reduce these numerous possible combinations to a manageable number, the Study Team has developed an array of ten alternative Strategy Sets.

These Strategy Sets include all four subcorridors, cover a full range of investment levels, and include a range of reasonable modal combinations. The Strategy Sets were reviewed and approved by the Study Managers. All of the comparative analyses presented in the later sections of this report are structured to address these ten Strategy Sets.

### 5.2.1 Range of Investment Levels

The ten Strategy Sets cover a full range of investment levels, from a Transportation System Management (TSM) strategy, Strategy Set #1, which is considered the base case, to a full-build scenario, Strategy Set #10, which includes all considered improvements. Between these endpoints, the Study Team developed eight additional Strategy Sets. These included the following:

- A "Minimum Build" option, Strategy Set #2
- A "Low Capital Investment" option, Strategy Set #3
- Three "Moderate Capital Investment" options, Strategy Sets #4, #5, #6
- Three "High Capital Investment" options, Strategy Sets #7, #8, and #9.

The estimated capital cost for the Minimum Build option is approximately $600 million. The Low Capital Investment option is estimated to cost approximately $750 million. The Moderate Capital Investment options are estimated to cost approximately $1 billion each, and the High Capital Investment options are estimated to have a capital cost of approximately $1.5 billion each. The full-build scenario would have a first cost of approximately $2.0 billion. For the three "Moderate" and "High" investment options, a range of modal combinations was considered.

### 5.2.2 Modal Combinations

The three Moderate and the three High Capital Investment Strategy Sets were structured to cover a range of modal options. One of the Moderate and one of the High Capital Investment Strategy Sets included some major highway elements, but with a predominant portion of the investment going to transit improvements. Each category of investment level also included a relatively balanced highway/transit program, and each included Strategy Sets with some major transit elements, but with an emphasis on highway improvements. The single Strategy Sets at the Minimum Build and Low Capital Investment levels also included both highway and transit elements.

### 5.2.3 Options Within Strategy Sets

For several of the specific strategies within each of the Strategy Sets, optional design concepts or optional alignments were developed during the conceptual engineering process. In certain instances, the differences in impacts of the several options appear to be significant, and it was felt they should be considered in the decision-making process.

This situation occurs for the rail transit strategy in the East Subcorridor, where four optional alignments have been presented. While some differences among these four options are significant, the level of detail in many aspects of the evaluation has not been sufficient to properly distinguish among the options in all areas. A second instance where design concept options have been presented is for the new highway strategy in the South Subcorridor. For this strategy, both Interstate highway and parkway options have been evaluated. Alignment options, termed the "western" and "eastern" corridors, have also been evaluated within the South subcorridor new highway strategy.

### 5.3 Phase 2 STRATEGY SETS

The ten Strategy Sets for which the Phase 2 comparative analyses was conducted are listed on the following pages, and shown in the graphic exhibits immediately following.

- Strategy Set #1: Transportation System Management - No Major Capital Investment
  - -- Transportation System Management in all subcorridors
  - -- South - River Des Peres Parkway Extension to Big Bend

- Strategy Set #2: Minimum Build
  - -- North - I-170 Interchange Reconstruction
  - -- South - River Des Peres Parkway Extension to Big Bend
  - -- East - I-64 Interchange Reconstruction
  - -- East - Rail Transit Extension to Clayton
  - -- West - I-64 Interchange Reconstruction

- Strategy Set #3: Low Capital Investment
  - -- North - I-170 Interchange Reconstruction
  - -- South - River Des Peres Parkway Extension to Big Bend
  - -- South - Rail Transit Extension, Clayton south to I-44
  - -- East - I-64 Interchange Reconstruction
  - -- East - Rail Transit Extension to Clayton
  - -- West - I-64 Interchange Reconstruction

- Strategy Set #4: Moderate Capital Investment - Highway Emphasis
  - -- North - I-170 Interchange Reconstruction
  - -- South - I-170 Extension to I-44
  - -- East - I-64 Interchange Reconstruction
  - -- East - Rail Transit Extension to Clayton
  - -- West - I-64 Lane Addition
  - -- West - I-64 Interchange Reconstruction

- Strategy Set #5: Moderate Capital Investment - Balanced Highway/Transit
  - -- North - I-170 Interchange Reconstruction
  - -- South - I-170 Extension to I-44
  - -- South - Rail Transit Extension, Clayton south to I-44
  - -- East - I-64 Interchange Reconstruction
  - -- East - Rail Transit Extension to Clayton
  - -- West - I-64 Interchange Reconstruction

- Strategy Set #6: Moderate Capital Investment - Transit Emphasis
  - -- North - I-170 Interchange Reconstruction
  - -- South - River Des Peres Parkway Extension to Big Bend
  - -- South - Rail Transit Extension, Clayton south to I-55 @ Butler Hill
  - -- East - I-64 Interchange Reconstruction

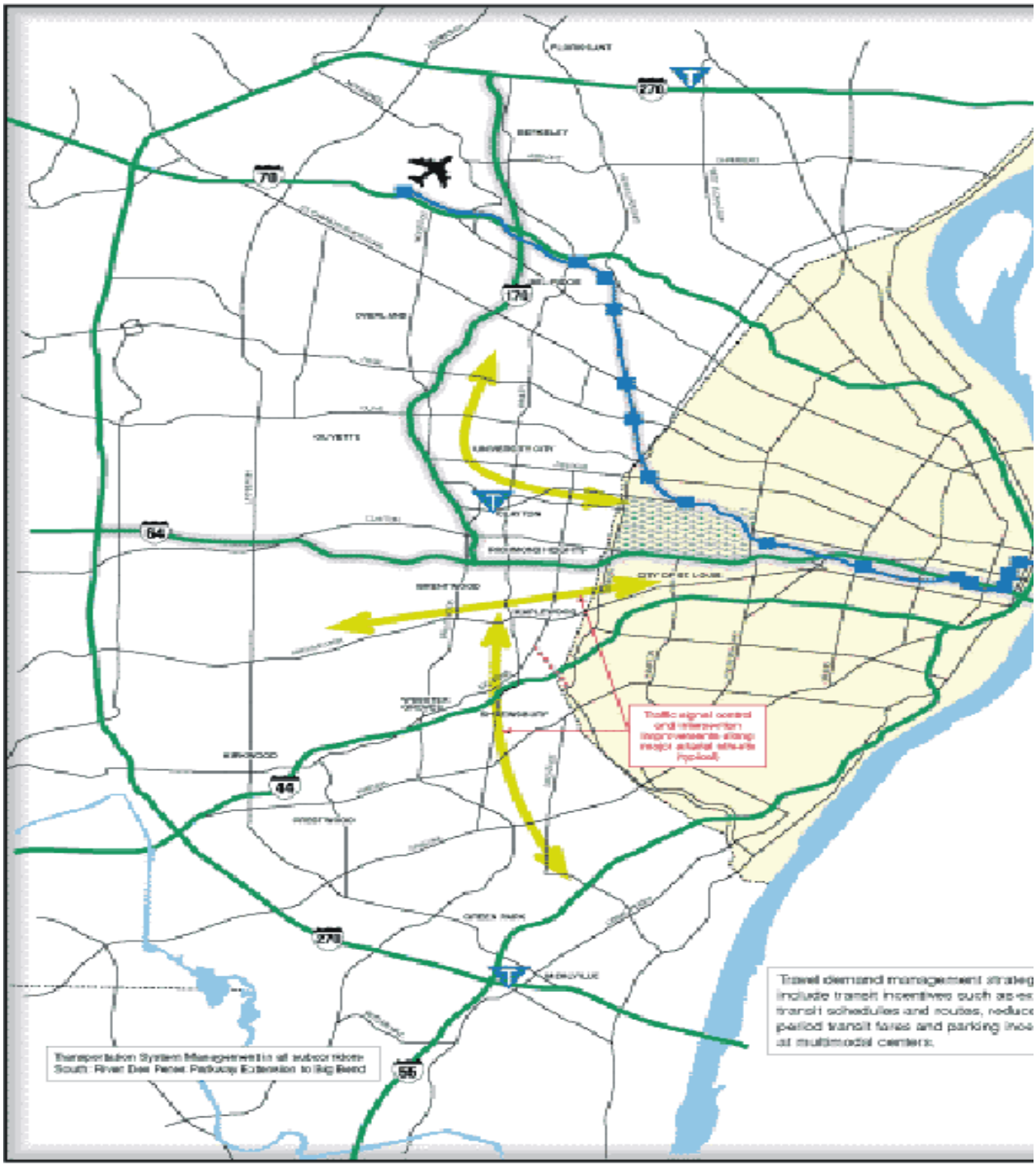
- -- East - Rail Transit Extension to Clayton
- -- West - I-64 Interchange Reconstruction

- Strategy Set #7: High Capital Investment - Highway Emphasis
  - -- North - I-170 Interchange Reconstruction
  - -- North - I-170 Lane Addition (HOV Facility)
  - -- South - I-170 Extension to I-55 (HOV Facility)
  - -- South - Rail Transit Extension, Clayton south to I-44
  - -- East - I-64 Interchange Reconstruction
  - -- East - Rail Transit Extension to Clayton
  - -- West - I-64 Lane Addition
  - -- West - I-64 Interchange Reconstruction

- Strategy Set #8: High Capital Investment - Balanced Highway/Transit
  - -- North - I-170 Interchange Reconstruction
  - -- North - I-170 Lane Addition (HOV Facility)
  - -- South - I-170 Extension to I-44 (HOV Facility)
  - -- South - Rail Transit Extension, Clayton south to I-55 @ Butler Hill
  - -- East - I-64 Interchange Reconstruction
  - -- East - Rail Transit Extension to Clayton
  - -- West - I-64 Lane Addition
  - -- West - I-64 Interchange Reconstruction

- Strategy Set #9: High Capital Investment - Transit Emphasis
  - -- North - I-170 Interchange Reconstruction
  - -- North - Rail Transit Extension, Clayton north to I-270
  - -- South - I-170 Extension to I-44
  - -- South - Rail Transit Extension, Clayton south to I-55 @ Butler Hill
  - -- East - I-64 Interchange Reconstruction
  - -- East - Rail Transit Extension to Clayton
  - -- West - I-64 Lane Addition
  - -- West - I-64 Interchange Reconstruction

- Strategy Set #10: Full Build
  - -- North - I-170 Interchange Reconstruction
  - -- North - I-170 Lane Addition (HOV Facility)
  - -- North - Rail Transit Extension, Clayton north to I-270
  - -- South - I-170 Extension to I-55 (HOV Facility)
  - -- South - Rail Transit Extension, Clayton south to I-55 @ Butler Hill
  - -- East - I-64 Interchange Reconstruction
  - -- East - Rail Transit Extension to Clayton
  - -- West - I-64 Lane Addition
  - -- West - I-64 Interchange Reconstruction




**Cross-County Corridor**

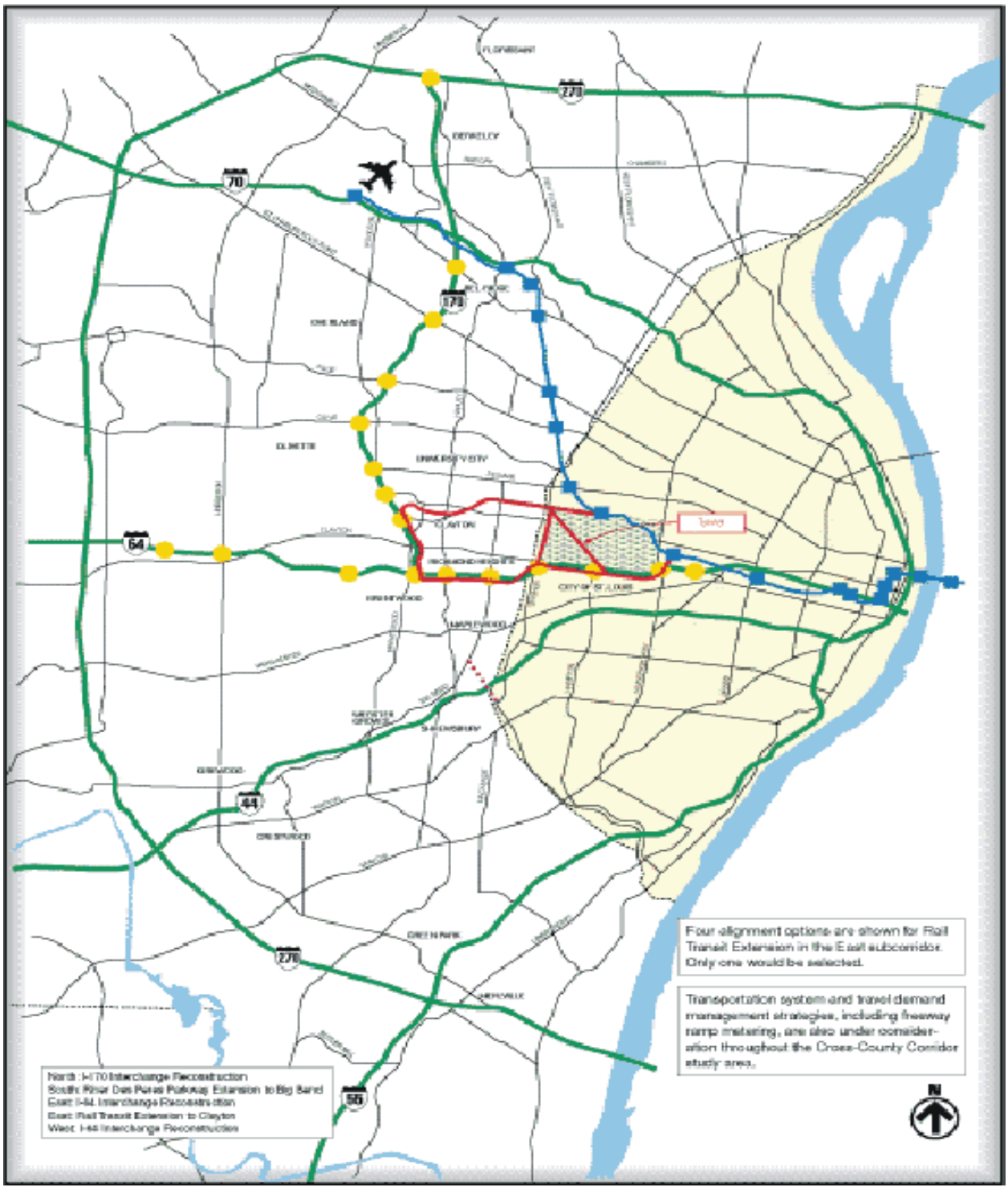
Major Transportation Investment Analysis

# Strategy Set No. 1

Figure 5-1

LEGEND

Traveler Information Syst
Potential Transit Center
Traffic Signal Improveme
Existing MetroLink
Existing Interstate Highw
Candidate Parkway Impr

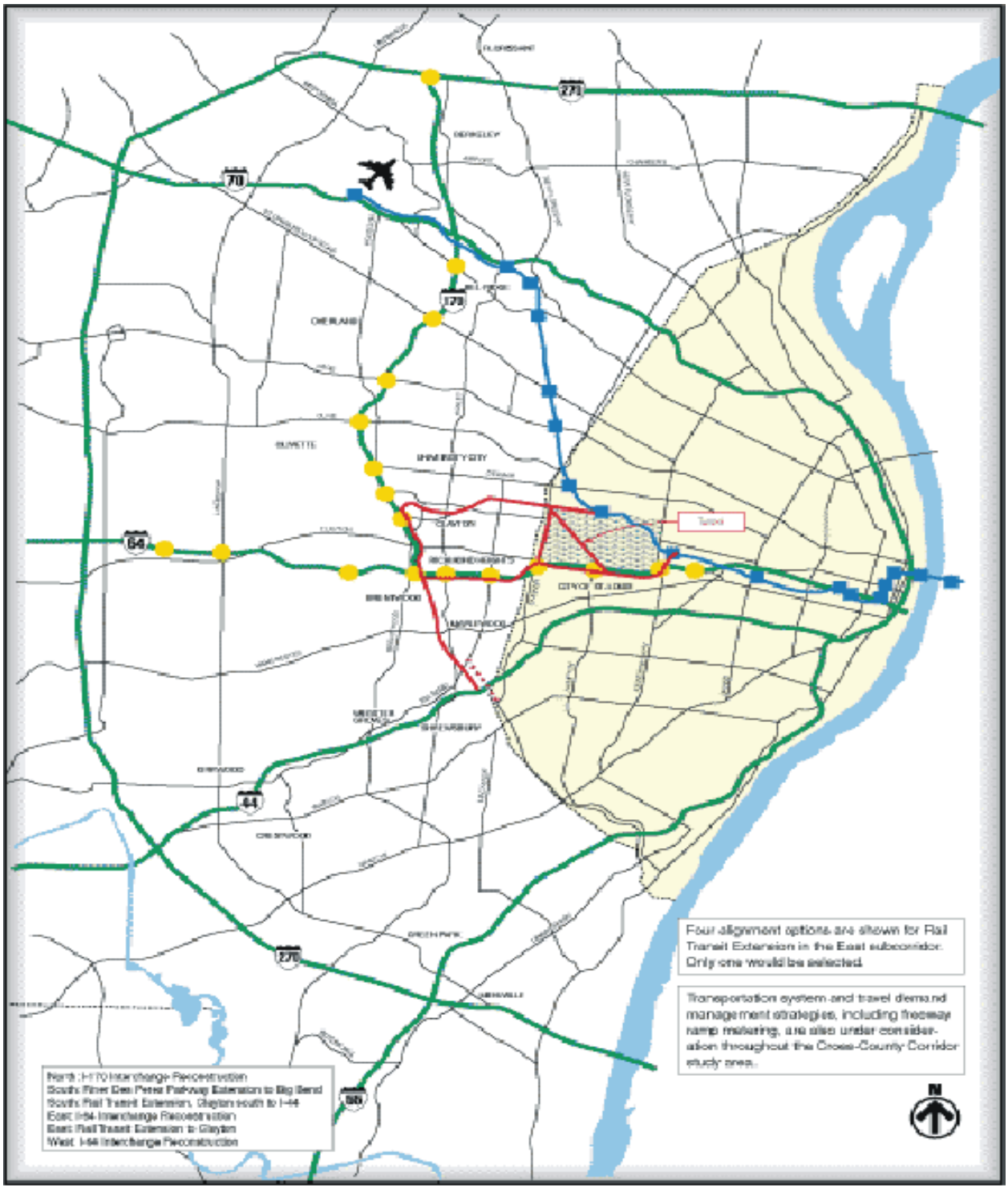



**Cross-County Corridor**
Major Transportation Improvement Analysis

LEGEND
- Candidate Parkway Improvements
- Candidate Interchange Improvements
- Candidate Rail Transit Extension
- Existing MetroLink
- Existing Interstate Highways

# Strategy Set No. 2

Figure 5-2



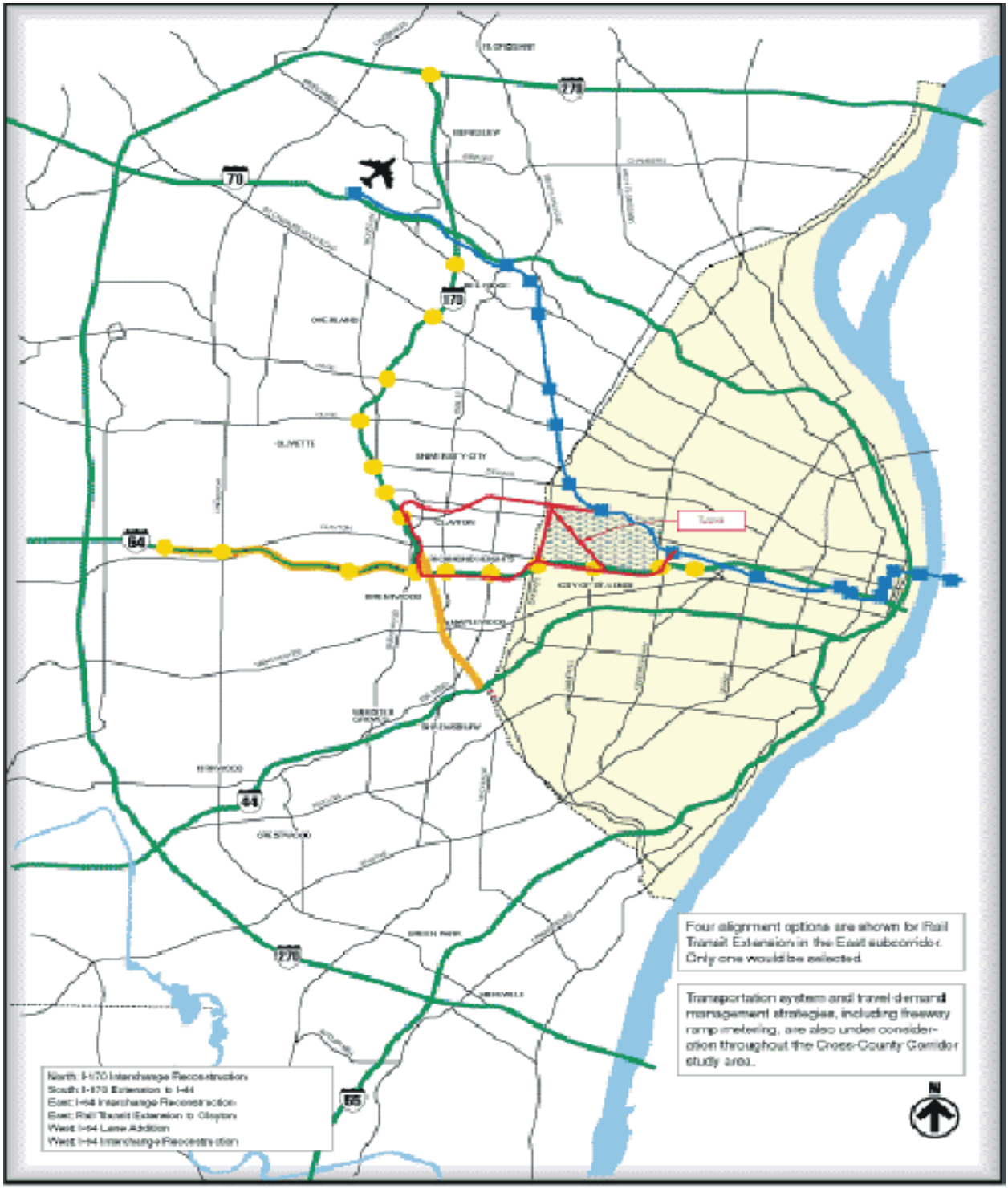

**Cross-County Corridor**
Major Transportation Investment Analysis

# Strategy Set No. 3

**Figure 5-3**

LEGEND

- Candidate Parkway Improvements
- Candidate Interchange Improvements
- Candidate Rail Transit Extension
- Existing MetroLink
- Existing Interstate Highways



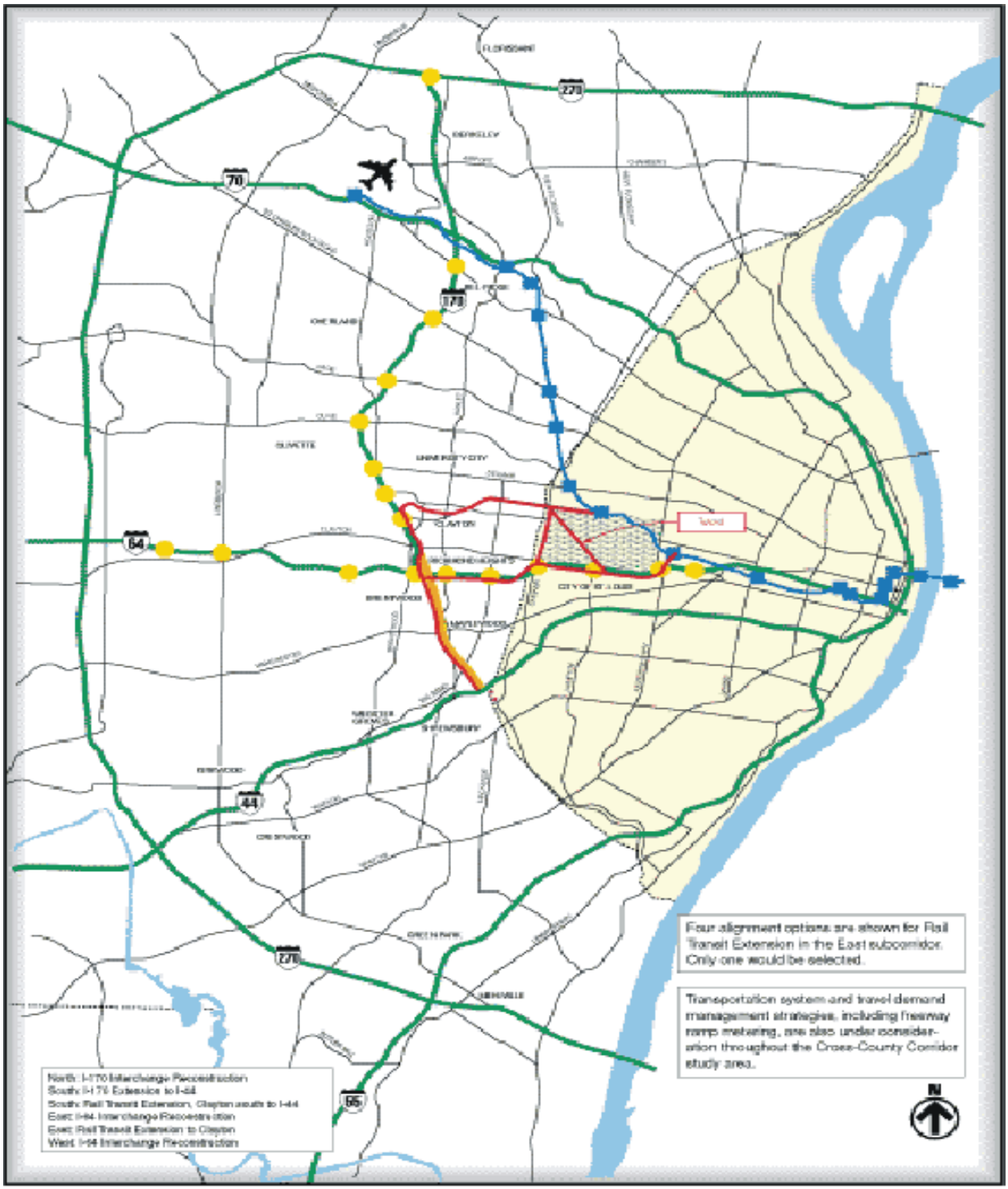

**Cross-County Corridor**
Major Transportation Investment Analysis

# Strategy Set No. 4

**Figure 5-4**

LEGEND

- Candidate New Roadway
- Candidate Parkway Connection
- Candidate Interchange Improvements
- Candidate Interstate Widening
- Candidate Rail Transit Extension
- Existing MetroLink
- Existing Interstate Highways

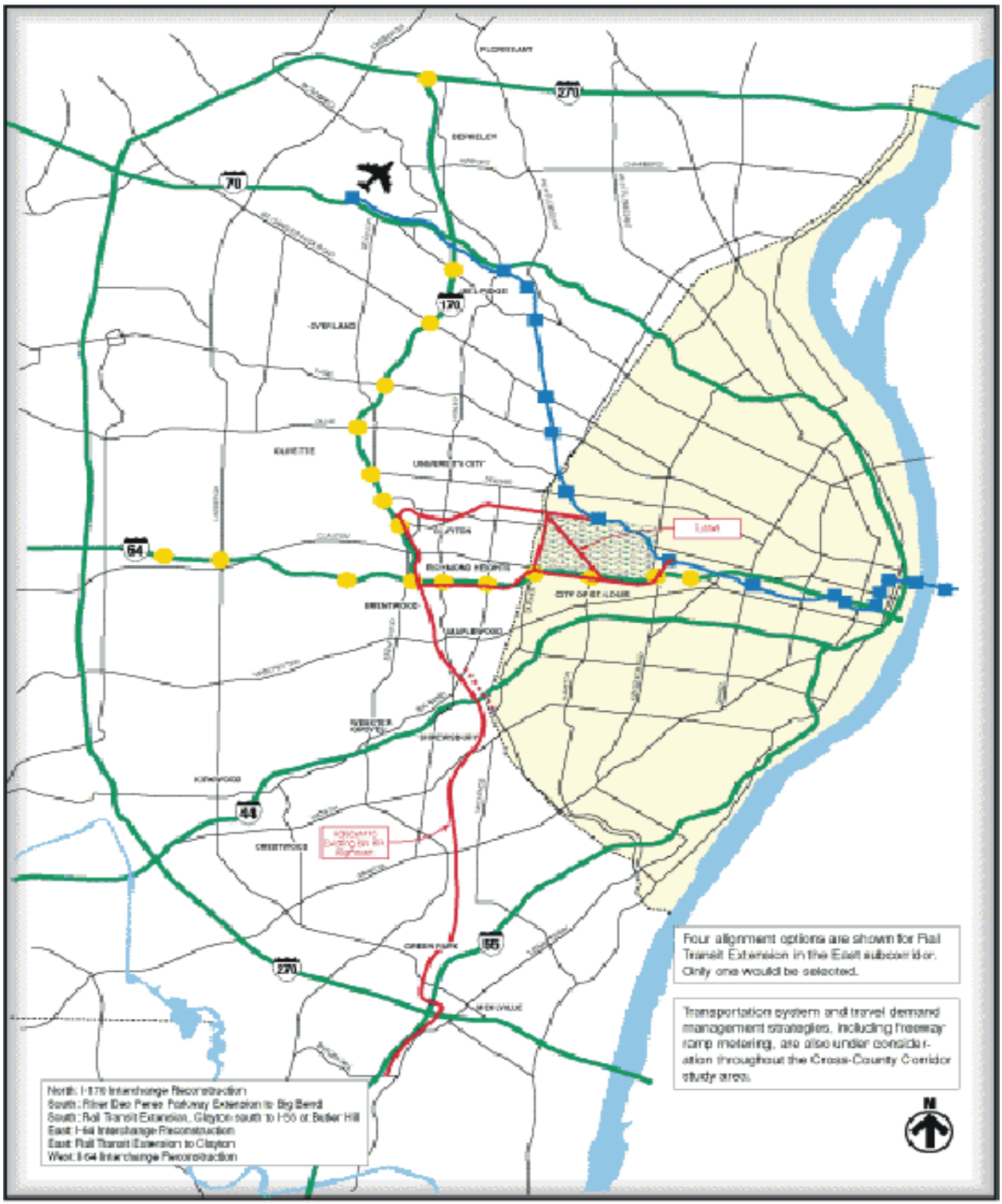



**Cross-County Corridor**
Major Transportation Investment Analysis

LEGEND
- Candidate New Roadway
- Candidate Parkway Connection
- Candidate Interchange Improvements
- Candidate Rail Transit Extension
- Existing MetroLink
- Existing Interstate Highways

# Strategy Set No. 5

Figure 5-5



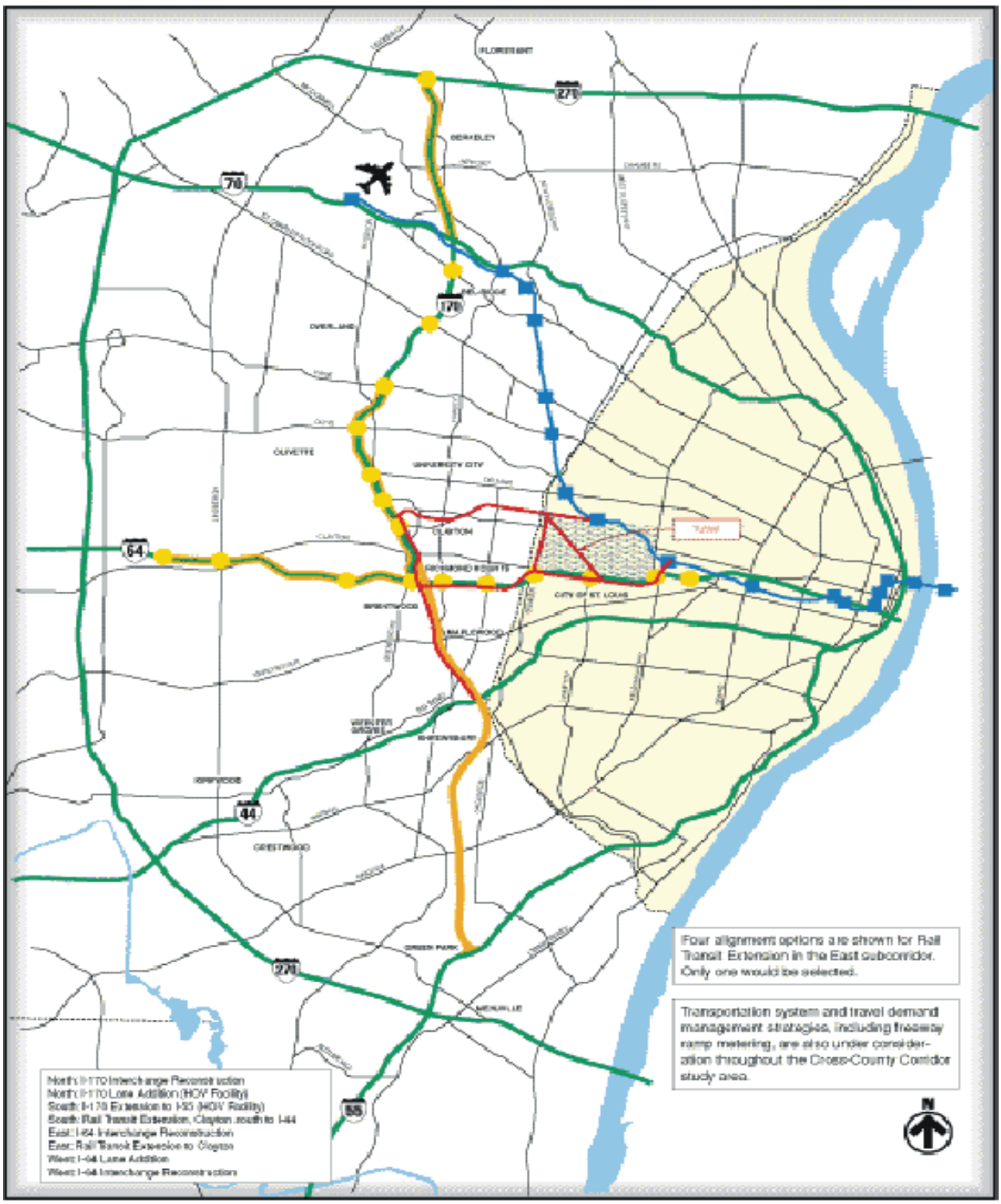

**Cross-County Corridor**
Major Transportation Investment Analysis

# Strategy Set No. 6

Figure 5-6

LEGEND

- Candidate Parkway Improvements
- Candidate Interchange Improvements
- Candidate Rail Transit Extension
- Existing MetroLink
- Existing Interstate Highways



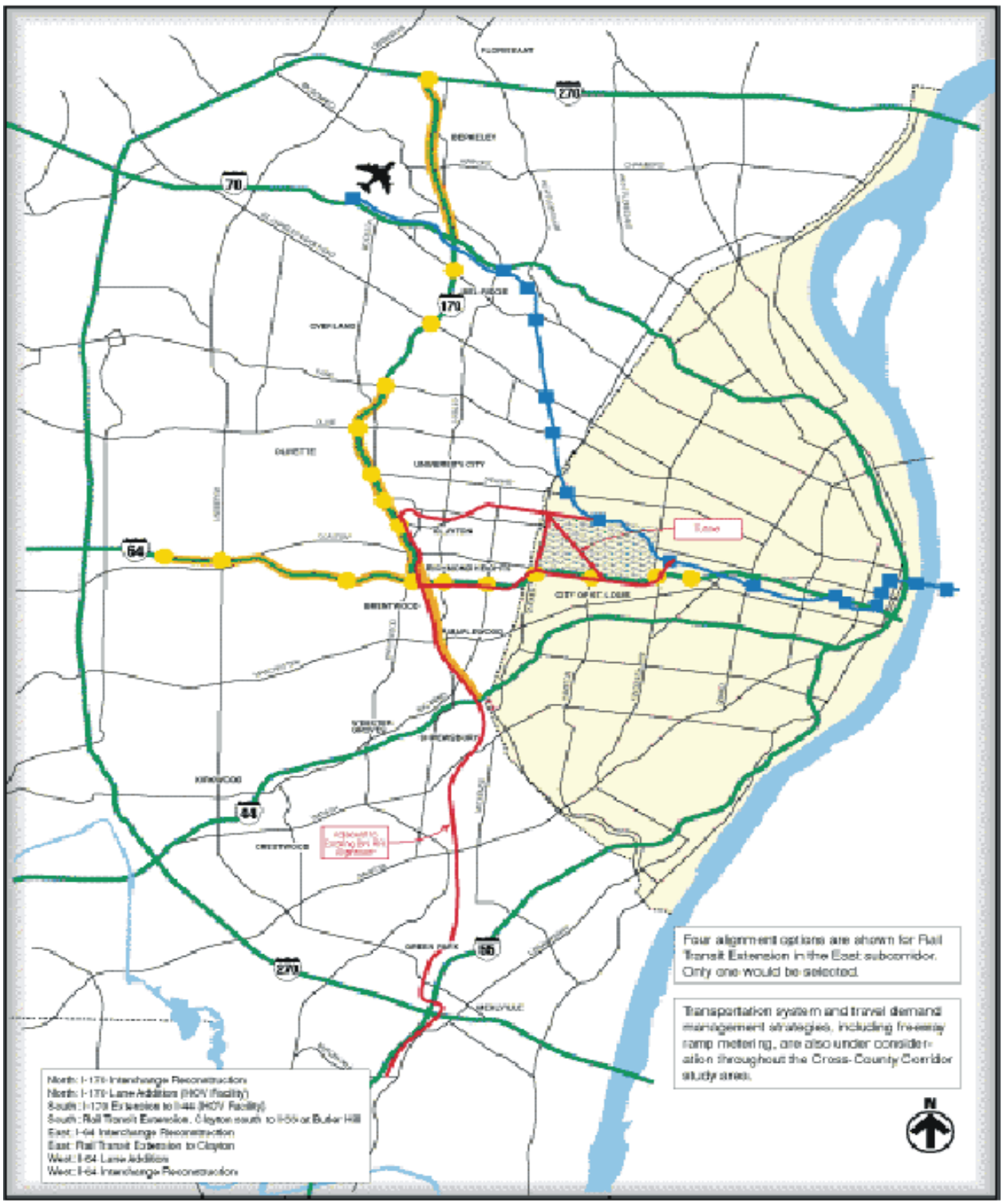

**Cross-County Corridor**
Major Transportation Investment Analysis

# Strategy Set No. 7

Figure 5-7

LEGEND

- Candidate New Roadway
- Candidate Interchange Improvements
- Candidate Interstate Widening
- Candidate Rail Transit Extension
- Existing MetroLink
- Existing Interstate Highways



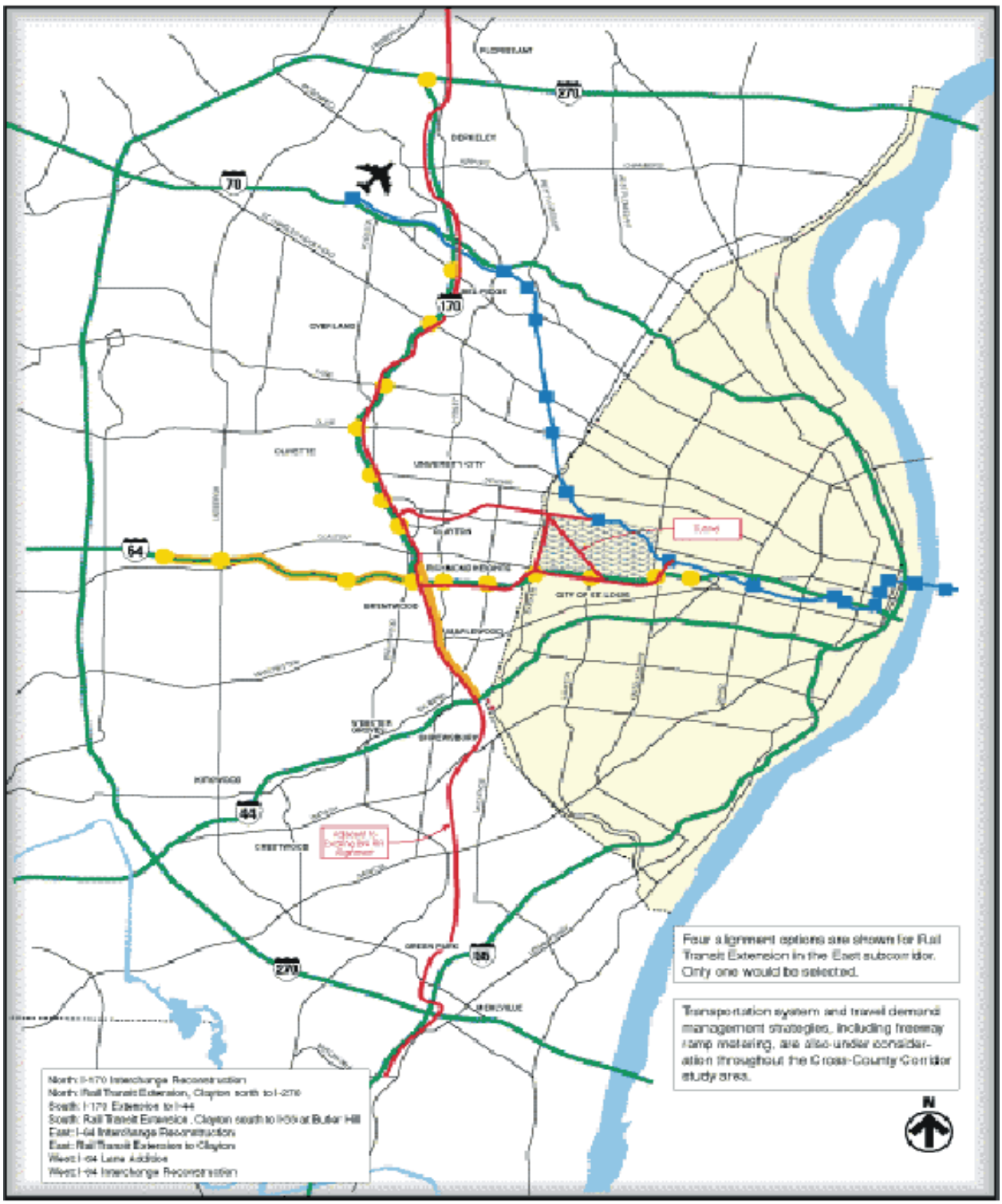

Cross-County Corridor
Major Transportation Investment Analysis

# Strategy Set No. 8

Figure 5-8

LEGEND

- Candidate New Roadway
- Candidate Parkway Connection
- Candidate Interchange Improvements
- Candidate Interstate Widening
- Candidate Rail Transit Extension
- Existing MetroLink
- Existing Interstate Highways



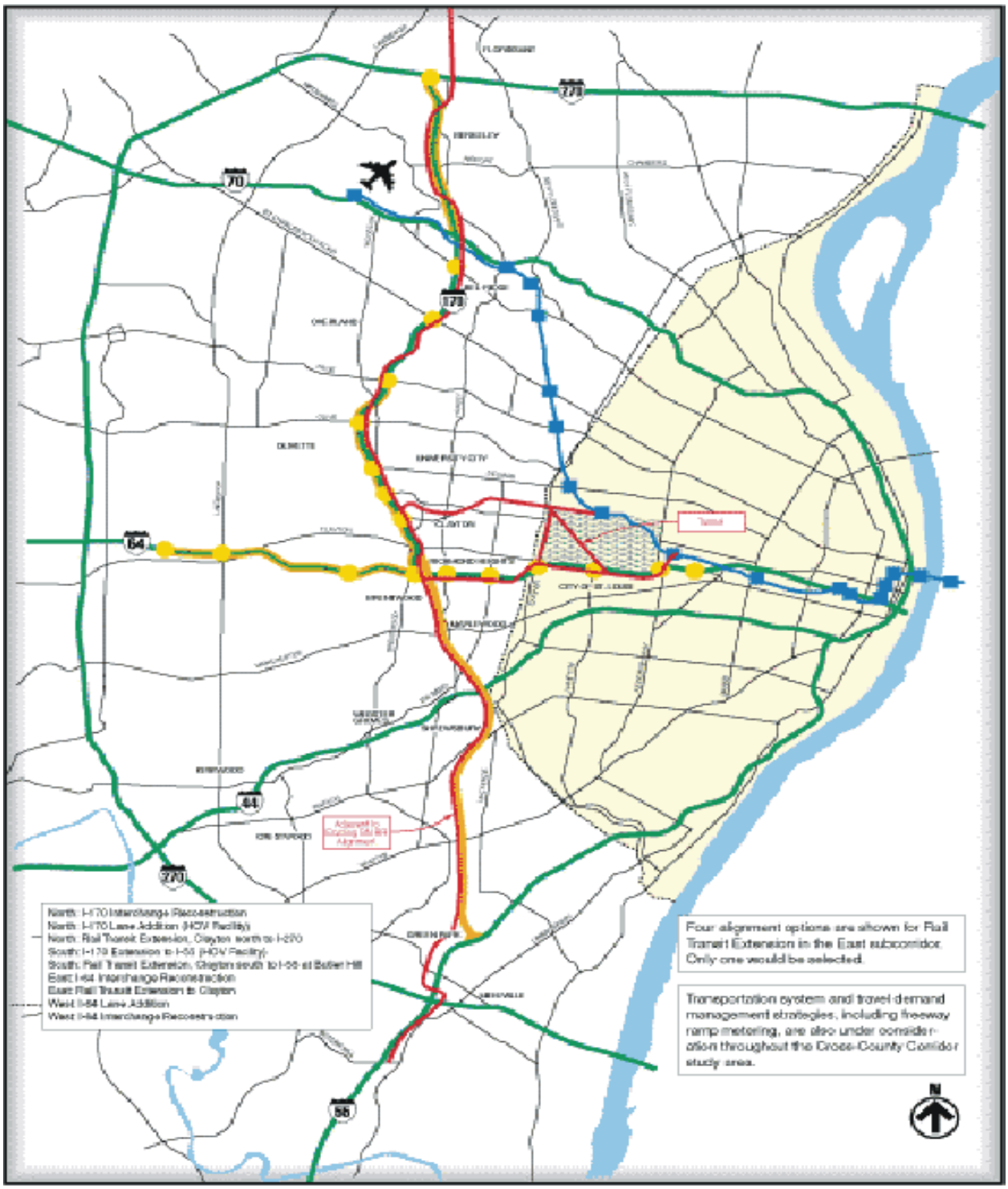

**Cross-County Corridor**
Major Transportation Investment Analysis

# Strategy Set No. 9

Figure 5-9

LEGEND

- Candidate New Roadway
- Candidate Parkway Connection
- Candidate Interchange Improvements
- Candidate Interstate Widening
- Candidate Rail Transit Extension
- Existing Metro Link
- Existing Interstate Highways




**Cross-County Corridor**
Major Transportation Investment Analysis

# Strategy Set No. 10

Figure 5-10

LEGEND

- Candidate New Roadway
- Candidate Interchange Improvements
- Candidate Interstate Widening
- Candidate Rail Transit Extension
- Existing MetroLink
- Existing Interstate Highways

# 6.0 EVALUATION OF PHASE II STRATEGIES

The evaluation of the ten Phase II Strategy Sets has followed the general guidance of the U.S. Department of Transportation's (USDOT) Major Investment Study guidelines. These USDOT guidelines view each of the alternative strategies from four perspectives - effectiveness, financial feasibility, cost-effectiveness, and equity. At the same time, it has been a major focus of this study to continually evaluate the alternatives in light of the locally identified problems within the Cross-County Corridor. Thus, each strategy has been rated by how well it addresses the problems identified earlier in the study, and by how well it deals with the related issues identified by the public.

Based on the problem identification process of Phase I of the study, a set of eleven categories were established for evaluation of the strategy sets. These categories are:

- Community and Regional Viability
- Traffic Congestion
- Accessibility
- Mobility
- Neighborhood Concerns
- Noise and Air Quality
- Natural Environment
- Safety Security
- Financial Feasibility
- Cost-Effectiveness
- Equity

Within these eleven evaluation categories, a total of 50 individual measures were established to rate each of the strategy sets. These individual measures are contained in the comparative matrices presented in Section 9 of Technical Memorandum No. 6,Evaluation and Comparison of Alternatives. (A complete listing of all of the Technical Memoranda prepared as a part of the Phase 2 analysis is contained in Appendix A at the rear of this report.) The following paragraphs describe the general process and methodology for computation of these individual measures.

## 6.1 TRAVEL FORECASTING

Travel demand forecasts for this study have been developed using the regional transportation model sets of the East-West Gateway Coordinating Council. These models follow the standard four-step urban transportation planning process of trip generation, trip distribution, modal choice, and route assignment. The modeling process is similar to that used in most other major metropolitan areas for urban transportation planning. This same basic model has previously been used for the St. Louis Transit Systems Analysis (1987-91), the St. Clair County AA/DEIS (1991-94), the St. Charles

County AA/DEIS (1994-95), and the St. Clair County FEIS (1996), thereby providing relative consistency in the approach to transportation demand forecasting.

### 6.1.1 EWGCC Model

The particular software used for the demand modeling process is MINUTP, Version 96A, which was introduced in 1996. The highway portion of the EWGCC model was last validated in November, 1992, with supplemental changes occurring as recently as October, 1994. The most recent changes expanded the highway network to a total of 1,066 zones, and the model now includes all of the St. Louis region, including the city of St. Louis and St. Louis County, St. Charles, Franklin, and Jefferson counties in Missouri, and St. Clair, Madison, and Monroe counties in Illinois. The No-Build highway network for the year 2015 assumed that the following major Missouri highway projects would be completed: Page Avenue Extension limited access facility from I-270 to Route N in St. Charles County; Route 370 Extension limited access facility from I-270 to I-70 in St. Charles County; and Route 141 limited access facility from I-64 to Route 30.
As part of the modeling effort for this study, a considerable amount of additional detail was added to the highway network, particularly for the freeway interchanges within the study area, to support a more detailed investigation of the effects of improvements to these interchanges.

The transit model was last updated in January, 1995, for the St. Charles County AA/DEIS. The current study has included coding and validation of a new transit network to provide a node structure that is consistent with the current highway network. The transit network for the No-Build scenario assumes that only those major capital projects already committed will be built, and thus includes only the St. Clair County extension of MetroLink. No other MetroLink extensions (including St. Charles) are presumed to be part of the No-Build scenario, nor are any of the Commuter Rail projects under study by the Bi-State Development Agency included.

Several refinements to the model's trip generation module have been proposed by this study to improve the accuracy of the model. The refinements include adding special trip generation rates for major colleges and universities, major shopping malls, major hospitals, and Lambert International Airport. These changes have been approved and adopted by EWGCC.

In keeping with Federal Transit Administration guidelines for analysis of transit alternatives, trip distribution will only be run one time - for the base case TSM forecast - and the resulting person-trip distribution will be used for projecting travel demand for all alternative strategy sets. Hence, the model will not take into account any potential induced trip-making which could result from enhanced accessibility. Likewise, the model does not allow any changes to the future land use or employment projections that might be induced to occur with implementation of any of the strategies.

The models used in this study were validated to actual 1994 traffic counts and transit patronage, using an interpolation of the 1990 and 1996 socioeconomic data sets as input.

### 6.1.2 Land Use and Socioeconomic Data

EWGCC also supplied their files of socioeconomic data for use in the model. Separate files of land use and demographic data for the years 1990, 1996, and 2015 were provided. All future year projections in this study, including assumptions about the future distribution of employment in downtown St. Louis, Clayton, and other portions of St. Louis County, were based on the EWGCC's current regional demographic projections for the year 2015. These projections were prepared independently by EWGCC, for use in all regional transportation planning studies.

### 6.1.3 Future Travel Demand Estimates

As with any mathematical model that attempts to predict human behavior twenty years in the future, a range of uncertainty is inherent in the process. It is, though, generally accepted in the planning profession that models such as the urban travel demand model used in this study provide a reliable and effective comparison of the relative differences among an array of alternative transportation strategies, and also provide the best available source of projections of absolute levels of travel by the various modes.

All of the transportation improvements considered as a part of this study were modeled only as elements of a complete strategy set package. Because of the interrelationship of the various discrete strategies and their effects on each other, each individual discrete strategy was not modeled as a distinct solution. Rather, each strategy set was modeled as a distinct alternative system that would account for all of the interrelationships.

Output from the model includes a wide variety of statistical travel data projected to occur with each of the alternative strategy sets. Regional, county, district, and corridor-level summaries of trip-making are included, as well as total person trips, transit person trips, and mode shares. All summaries reflect stratification by trip purpose and, for transit trips, also include stratification by access mode. Highway travel projections include estimates of vehicle miles traveled, vehicle hours of travel (free-flow and congested), and congested travel speeds. Peak period and daily link volumes are also available for select roadways within the corridor. Supplemental transit data includes mode-specific tabulations of daily ridership, peak line volumes, and station boardings and alightings.

## 6.2 TRANSPORTATION IMPACTS

Transportation impacts resulting from changes to the regional transportation system that would occur with each of the ten alternative strategy sets were analyzed using the EWGCC regional travel demand model described above. The model produces a wide range of statistics regarding projected travel, and a number of these were selected for use in this analysis. Since this study examined a variety of modes, statistics relevant to person-travel regardless of mode were used wherever possible. These statistics, or "performance measures", were used to evaluate how effective each strategy is in addressing the problems and issues identified in the study area.

### 6.2.1 General Transportation Measures

A variety of statistics relevant to all modes were extracted from the model results to provide indicators of how each strategy set addresses the problems of traffic congestion, accessibility, mobility, safety and security, and community and regional viability. In several instances, measures were selected that focus on trips between specific locations. These locations were chosen for a variety of reasons, including their importance in the study area, their direct relationship to specific problems identified in the scoping process, and their ability to be representative of a large number of similar trips. Obviously many other origin-destination pairs could have been selected for this evaluation. The study team believes that those used present a balanced, representative reflection of the transportation impacts of the strategy sets. The transportation measures relevant to all modes used in the comparative analysis are presented below. Detailed definitions of the measures and their actual values for each strategy set are presented in Section 9 of ***Technical Memorandum No. 6, Evaluation and Comparison of Alternatives***.

- Person-Hours of Travel and of Delay
- Mode Split
- Weighted Average Travel Time from Major Employment Centers
- Weighted Average Travel Time from Major Shopping Centers
- Weighted Average Travel Time from Other Major Attractions
- Travel Times Between Selected Zone Pairs
- Weighted Average Travel Time for Peak Period Trips to Clayton and Downtown St. Louis CBDs

### 6.2.2 Mode-Specific Transportation Measures

In some instances, the problems identified in the problem definition process were of necessity mode-specific. For these problems, mode-specific measures were selected to evaluate how the strategies address those problems. These measures are:

- Freeway and Arterial Lane-Miles at Level-of-Service E or Worse
- Vehicle-Hours of Travel
- Vehicle-Miles of Travel
- Vehicle-Miles of Travel By Road Classification
- Percent of Vehicle Miles Traveled on Limited-Access Roadways
- Changes in Proportion of Rail Transit vs Bus Boardings
- Average Transit Travel Times Weighted by % of Low Auto-Ownership Households

### 6.2.3 Other Transportation Measures

In addition to the evaluation measures listed above, a number of other measures were used to assess the effectiveness of the transportation solutions. A number of these transportation measures were not derived from the output of the transportation demand models. These non-model transportation measures included the following:

- -- Peak Hour Person-Carrying Capacity in the Corridor
- -- Ease of Increasing Capacity Within the Corridor
- -- Improves Access to the Regional Highway System
- -- Rail Transit Access to Major Destinations
- -- Disruption During Construction
- -- Elimination of Hazardous Features

The actual value of key transportation measures for each of the strategy sets and for select discrete strategies are presented in Section 7 of this report.

## 6.3 COST ESTIMATES

### 6.3.1 Capital Cost Estimating Methodology

Generally, capital cost estimates were developed by identifying major construction items or system components, developing unit costs for each, and applying those unit costs to the estimated quantities of each major item or component. One-time "soft" costs for engineering, administration, construction management and supervision, legal and insurance expenses, and similar items necessary for completion of construction were also included. These costs were estimated as a percentage of the total construction cost.

Highway-specific capital cost estimates were based on unit costs for a variety of items within six major component categories. These major categories were site preparation, pavement, structures, interchanges, land acquisition, and miscellaneous items. Unit costs were drawn from recent Missouri Department of Transportation cost data. A contingency of 30% was added to all of the major cost elements, including right-of-way.

Transit capital costs were based on historic unit costs escalated to 1996 dollars for particular types of LRT alignment, such as at-grade, below-grade, on structure, etc. These unit costs were estimated on a per-mile basis, and included provision of trackwork, traction power, signals and communication, and utility relocation. Unit costs for a total of 29 different types of alignment were used. Station costs were estimated on a lump sum basis by type of station, for nine different station types. Right-of-way costs were estimated on a parcel-by-parcel basis based on the type of improvements on the property, and on a per-mile basis along the alignment for standard legal and acquisition costs. Costs for LRT vehicles were based on recent purchase prices for the current MetroLink vehicles. The number of cars was estimated as the total needed to operate two-car trains at the peak period headway plus 15% spares. Yard and shop capital costs were estimated as a linear function of the number of new vehicles, at the pro-rata share of the cost of a facility that would service a 50-car fleet. A contingency percentage of 20% was added to all construction items. A contingency of 50% was used for right-of-way estimates, and 10% for vehicle costs.

The resulting capital cost estimates are presented in Section 4 of ***Technical Memorandum No. 6, Evaluation and Comparison of Alternatives.***

### 6.3.2 Operating Cost Estimating Methodology

Highway operating and maintenance unit costs were obtained from the Missouri Department of Transportation and from St. Louis County and City. Patrol costs were obtained from the Missouri Highway Patrol. Major cost components included pavement, shoulders and approaches, drainage, bridges, snow and ice control, traffic signals, and miscellaneous (including equipment and labor salary-related expenses).

Operating costs for rail transit were based on the Operating Cost Model developed for the St. Louis light rail transit system as used previously for the St. Clair and St. Charles MetroLink extension studies. The principal cost components include operations, maintenance of equipment, maintenance of way, and general and administrative expenses

O&M cost estimates for each of the strategies are presented in Section 5 of ***Technical Memorandum No. 6, Evaluation and Comparison of Alternatives***.

### 6.3.3 Financial Feasibility Measures

A number of evaluation measures were developed to examine the capital and operating costs and cost-effectiveness aspects of each of the strategy sets. These measures include the following:

- Capital Cost
- Annual Operating and Maintenance Cost
- Annualized Life-Cycle Cost Per Reduced Person-Hour of Travel
- Annualized Life-Cycle Cost Per Reduced Travel Delay
- Annualized Life-Cycle Cost Per New Daily Transit Rider
- Annualized Cost to Society

These measures are defined in Section 9 of Technical Memorandum No. 6,Evaluation and Comparison of Alternatives.

## 6.4 SOCIAL, ECONOMIC, AND ENVIRONMENTAL IMPACTS

An analysis of the social, economic, and environmental effects of each of the discrete transportation strategies was conducted to identify the potential for significant impacts, as well as the potential for significant differences in impacts between alternative strategies. Wherever possible, impacts attributable to each individual strategy were quantified, and then aggregated to show the cumulative impact of the combined strategies in each Strategy Set.

### 6.4.1 Relationship to NEPA Environmental Analysis

The study process of this Major Transportation Investment Analysis was structured to precede the detailed environmental analysis that would be conducted for an environmental impact statement. Those strategies selected for further development following Phase II of this study, and for which federal funding will be sought, will be subjected to the detailed environmental analysis required by NEPA. This approach is

consistent with the conceptual level of detail to which the alternative strategies have been developed; in most instances in the current MTIA, the engineering detail necessary to support an EIS-level environmental analysis simply does not exist, and will be developed only in the preliminary engineering phase, following the MTIA.

### 6.4.2 Impact Areas

The discrete strategies were evaluated in each of the particular disciplines of environmental analysis to identify if that strategy presented a "fatal flaw" or other major impact that would be sufficiently significant to affect the MTIA decision-making process. The specific discipline areas investigated included the following:

- -- land use plan compatibility
- -- land acquisition and displacements
- -- economic impacts
- -- neighborhood impacts
- -- historic or cultural resources
- -- noise
- -- air quality
- -- wetlands
- -- floodplains
- -- special habitats

The methodologies employed to conduct these evaluations have been presented in ***Technical Memorandum 5A, Social, Economic, and Environmental Methodologies.*** These impact areas include several of the evaluation categories used in the comparative analysis, such as Community and Regional Viability, Neighborhood Concerns, Noise and Air Quality, the Natural Environment, and Equity issues. The following measures are defined in detail in Section 9 of ***Technical Memorandum No. 6,Evaluation and Comparison of Alternatives***.

- -- Number of New Transit Stations
- -- Reduction of Vehicular Traffic in Residential Neighborhoods
- -- Non-Auto Trip % and Reduction in VMT on Lower-Classification-Roadways
- -- Enhances Major Employment or Business Centers
- -- Fosters Redevelopment of Underutilized Areas
- -- Effect on Community Tax Base
- -- Businesses Displaced
- -- Dwelling Units Displaced
- -- Net Park Area Lost
- -- Number of Community Facilities Displaced
- -- Number of Residences Taken
- -- Generates Traffic in Residential Areas
- -- Neighborhood Aesthetics
- -- Impact on Historic or Cultural Sites
- -- Noise Impacts
- -- Emission of Air Pollutants

- -- Impact on Streams
- -- Protected Species
- -- Floodplain impacts
- -- Weighted Average Travel Time for Non-Car-Owners
- -- Low Income Residential Relocations as a Percentage of Total Relocations

## 6.5 FINANCIAL ANALYSIS

The financial analyses conducted as part of this study examined the ability of existing financial resources to meet the capital, operating, and maintenance costs of the several strategy sets under consideration. These analyses also identified and evaluated potential new revenue sources, and developed financial plans for the construction and operation of the strategy sets. As part of this analysis, the financial capacities of both MoDOT and Bi-State were reviewed.

### 6.5.1 Funding Sources

Financial analysis for the study included a review of all potential funding sources. These included federal, state and local government, and other local funding sources. Federal sources have historically provided the greatest share of funding for transportation construction, and have heretofore provided that assistance on a relatively mode-specific basis. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) has greatly increased the flexibility with which local transportation officials can use federal funds between the highway and transit modes. At the same time, recent public sector budget pressures have limited the amount of federal funding available, particularly for transit projects.

Another factor affecting potential federal transit funding is the current federal practice of funding only one major rail transit project at a time in a single metropolitan area. With federal funds currently committed to the St. Clair County MetroLink extension to Belleville Area Community College, a continuation of that practice would make it unlikely that significant FTA funding would be available for another MetroLink extension until after completion of the St. Clair County extension construction, currently estimated for June, 2001.

The availability of federal highway funding is somewhat more predictable. The analysis has considered the federal highway funding expected to be available to the state of Missouri, and the portion of that expected to be available to the St. Louis region. Highway requirements in the other parts of the St. Louis region outside the Cross-County corridor will of course be competing for a significant portion of those available funds. The exact portion of the regional share that can be devoted to Cross-County projects will be a local political decision.

The principal local funding source for transit projects is the County Public Transit Sales Tax Trust Fund, or "Proposition M". This quarter-percent sales tax is expected to generate a combined total of approximately $36 million annually from St. Louis County and the city of St. Louis.

### 6.5.2 Implementation Schedules

A wide variety of factors can influence the schedule for implementation of the alternative strategy sets under consideration. In fact, because each strategy set contains several separate modal elements, each with their own implementing agency, the actual implementation schedules will in all likelihood ultimately be developed independently once a decision is made to proceed with a particular package. Other factors that will influence the implementation schedule will be the availability of funding, design/construction options (whether conventional or design-build), and whether or not federal funds will be used in the project.

Capital cost estimates for the various strategy sets under consideration range from several hundred million dollars to over two billion dollars. For combinations of projects of that magnitude, staging of projects may be necessary over more than a ten-year period. With the development of projects using entirely local funds, it is likely that essentially the same level of planning and environmental analysis will be conducted, but the sometimes lengthy federal process of document review and approval may be shortened considerably if only local approvals are required. Another issue potentially affecting implementation schedules is the interrelationship of multimodal projects within the same general corridor. There may be significant cost efficiencies to be obtained by coordinating construction, as well as minimization of construction disruption.

### 6.5.3 Financial Feasibility

For each of the strategy sets, a reasonable implementation schedule was developed in light of the funding anticipated to be available. These schedules are based on presumptions by the Study Team regarding the percentage of regional transportation dollars that could be dedicated to the Cross-County Corridor in light of the competing interests in the rest of the region. All of the strategy sets were estimated to cost less than the total transportation funding available to the region over the next 19 years (1997 - 2015). For the most expensive sets, difficult political decisions will need to be made regarding transportation priorities in the region, and it will be necessary to draw out the implementation schedule over a greater period of years.

### 6.5.4 Financial Feasibility Measures

A number of evaluation measures were developed to rate the financial feasibility of each of the strategy sets. These measures are the following:

- Percentage of Anticipated Regional Transportation Funding Required
- Feasibility of Alternative Revenue Sources
- Potential for Private Sector Participation

These measures are defined and quantified in ***Technical Memorandum No. 6, Evaluation and Comparison of Alternatives.***

# 7.0 COMPARISON OF ALTERNATIVE STRATEGIES

To facilitate comparative evaluation of the large number of alternative actions considered in the Cross-County Corridor, those alternatives were grouped into ten (10) Strategy Sets, each with a different array of strategies to be implemented in each of the subcorridors of the study area. As those Strategy Sets were compared, more detailed evaluations were made of some of the discrete strategy components of the Strategy Sets. This section describes the structured evaluation process used to compare the Strategy Sets and presents details of the comparisons of the Strategy Sets and the discrete strategies.

## 7.1 COMPARISON OF STRATEGY SETS

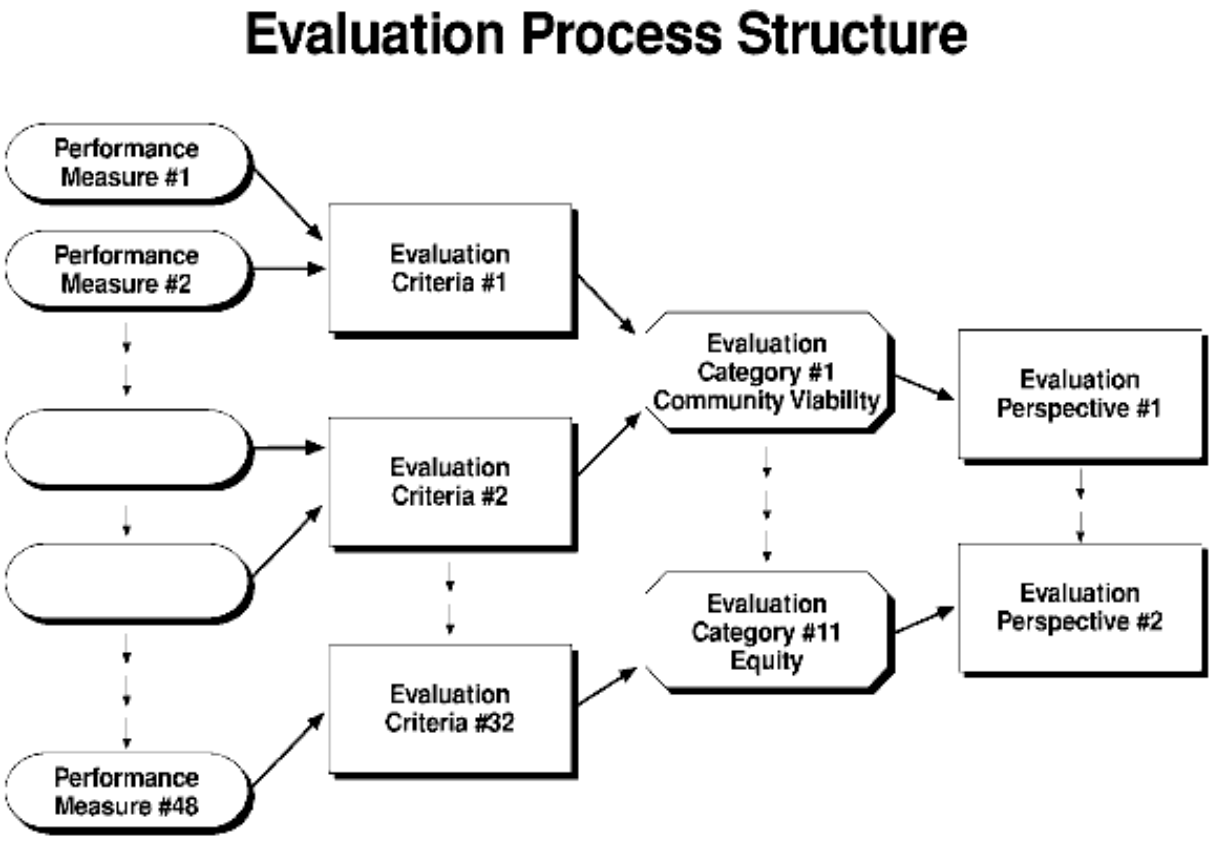
### 7.1.1 Structured Evaluation Process

For the evaluation of the ten alternative Strategy Sets described in Section 5 of this report, a structured process was developed by the Consultant (with input from the Study Mangers) to evaluate how each of the Strategy Sets addressed the problems and issues identified in Phase I of the study. In Phase 1, evaluation criteria were developed to screen the broad conceptual strategies to determine those strategies that merited further evaluation in Phase 2. The Phase 2 structured evaluation presented here builds on the initial evaluation criteria by maintaining the same basic categories of evaluation, but investigating them in more detail as allowed by the greater specificity to which the strategies were developed through the conceptual engineering process.

While having more detail on the strategies allows the development and evaluation of a significantly larger number of measures to rate their effectiveness, it is still necessary, ultimately, to aggregate the measures used in the structured evaluation to a more manageable number of variables on which to base recommendations. This structured evaluation process is summarized in the following sections.

The general principle for the Phase 2 evaluation was to employ the same basic standards for evaluation which were established in the problem identification process of Phase 1. To effectively use the additional detail available in Phase 2 regarding the strategies, a hierarchical structure of evaluation categories, criteria, and performance measures was developed. Within the eleven evaluation categories, a total of 32 evaluation criteria were established. These criteria were intended to assess how the Strategy Sets perform in addressing the problems and issues. In order to quantify these criteria from the detailed analysis data available, the criteria were further subdivided into 50 performance measures. The diagram (Figure 7-1) on the following page summarizes the structure of this process.

**Figure 7-1**
**Evaluation Process Structure**




The eleven evaluation categories are all subsets themselves of the four evaluation perspectives of Effectiveness, Financial Feasibility, Cost-Effectiveness, and Equity established in the USDOT's Major Investment Study guidelines.

**7.1.1.1 Performance Measures.** The most basic level of analysis in this evaluation structure is therefore the performance measure. In some instances, these performance measures are objective numbers, derived from a quantification of some aspect of the Strategy Set, and are expressed in precise units of the measure. Examples of such objective measures include estimated capital cost, number of residential relocations, and total hours of traveler delay.

In several cases where the measure cannot be precisely calculated, the performance measures include a qualitative element, and are expressed on a rating scale of 0 to 5. Qualitative measures are evaluated based on the professional judgement of the Consultant study team. Examples of this type of measure include disruption during construction, travelers' sense of security, likely effects on community tax base, etc.

The diagrammatic representation of the evaluation process structure (Figure 7-1) is completely developed and presented at Table 7-1. This tabulation clearly depicts the association made by the Study Team of selected multiple performance measures to selected specific evaluation criteria, and the subsequent association of one or more evaluation criteria to an agreed upon specific evaluation category. As indicated above, the number of parameters creates an extensive tabulation.

**7.1.1.2 Performance Measure Scores.** In order to allow aggregation of the various performance measures into a value for a single evaluation criteria, it was necessary to convert the raw number of each performance measure into a relative score for each Strategy Set as compared to the others. These scores were expressed to one decimal place within a range of 0 to 5, with the higher score always indicating the “best”. Scores for each of the 50 performance measures were calculated by the Consultant study team to reflect the relative differences among the ten Strategy Sets. This was a mostly objective process, with minimum “value judgements” entering into the scoring. The values for the 50 raw performance measures for each Strategy Set are presented on Table 9-1 in Section 9 of ***TM No. 6, Evaluation and Comparison of Alternatives***.

**7.1.1.3 Evaluation Criteria Score**. Subsequently, and to arrive at a single score for each of the 32 evaluation criteria, the individual performance measure scores contributing to each evaluation criterion were summed and averaged. This process reflects the implicit assumption that each performance measure contributes equally to the evaluation criteria score. These averaged scores provide an indication of the relative effectiveness of each of the ten Strategy Sets at addressing each of the particular evaluation criteria.

**Table 7-1**

**EVALUATION PROCESS HIERARCHY**

| Performance Measure | Criteria | Category |
|---|---|---|
| qualitative with 0-5 ranking based on number of new transit stations | supports existing or planned community land use | Community and Regional Viability |
| qualitative with 0-5 ranking based on whether improvements result in areas mentioned in Problem Statement | reduces vehicular through traffic in residential areas | |
| qualitative with 0-5 ranking based on changes in mode shift and VMT by road class | supports pedestrian/bicycle-friendly environment | |
| qualitative with 0-5 ranking based on proximity of improvements to BJC, McDonnell Douglas, Clayton, downtown St. Louis, Galleria and vicinity, Sunnen, Hanley Industrial Park and Federal Records Center | enhances existing and planned employment or business centers | |
| qualitative with 0-5 ranking based on proximity of improvements to Arena, Technopolis, Kinloch and any other areas mentioned in Problem Statement | fosters redevelopment of underutilized areas | |
| total area of right-of-way taken off tax rolls and devoted exclusively to transportation purposes | affects existing community tax base positively | |
| weighted travel time for Clayton and downtown St. Louis | enhances economic viability of core business area | |
| number of displaced businesses | requires zero to minimal business and residential displacements | |
| number of displaced dwelling units | | |

| Performance Measure | Criteria | Category |
|---|---|---|
| person hours of delay | improves efficiency | Traffic Congestion |
| mode split | | |
| lane miles by functional class at LOS E or worse | | |
| vehicle hours of travel | | |
| vehicle miles of travel | | |
| person-carrying capacity in corridor in peak hour | increase corridor capacity | |
| qualitative with 0-5 ranking of ease of increasing capacity over time | | |
| Weighted travel times for McDonnell Douglas, Clayton, BJC, Federal Records, St. Louis CBD | improves connectivity to major destinations | Accessibility |
| Weighted travel times for Galleria, Plaza Frontenac, South County Center, Northwest Plaza | | |
| Weighted travel times for Airport, Forest Park Community College, Washington University, St. Louis Zoo/Art Museum, Science Center | | |
| qualitative with 0-5 ranking of connection to regional highway and/or rail system | provides enhanced access to regional system | |
| travel times between these zone pairs<br>Origins: Green Park, Creve Coeur, Near Northside, Kinloch<br>Destinations: Clayton, Downtown St. Louis, Airport | improves travel times | |
| number of major land uses/developments within ½mile of new rail transit stations | offers more transportation options to major destinations | Mobility |
| weighted travel time for non-car owning traffic analysis zones | improves availability of services for transportation-disadvantaged | |

| Performance Measure | Criteria | Category |
|---|---|---|
| net park area lost | encroaches into residential areas or parks | Neighborhood Concerns |
| number of community facilities displaced | | |
| number of residences taken | | |
| qualitative with 0-5 ranking based on anticipated changes | generates traffic through residential areas | |
| qualitative with 0-5 ranking based on anticipated changes | inconsistent with neighborhood aesthetics | |
| number of sites impacted and severity | impacts historic or cultural sites | |
| number of sensitive receptors impacted | minimize effects of noise in sensitive areas | Noise and Air Quality |
| effect on regional emissions | improves regional air quality | |
| length of streams impacted | impacts natural environment | Natural Environment |
| number of special interest species or high value habitats impacted | | |
| length of encroachment flood plains | | |
| qualitative with 0-5 ranking based on changes in traffic volumes by road classification | reduces accidents | Safety and Security |
| qualitative ranking based on extent of elimination of hazardous highway features | | |
| qualitative with ranking based on % VMT on limited access roadways | improves travelers sense of security | |
| qualitative ranking based on extent of elimination of hazardous highway features | | |
| qualitative with 0-5 ranking, based on judgement of duration and extent of construction activity in relationship to existing highways | minimizes disruption during construction | |

| Performance Measure | Criteria | Category |
|---|---|---|
| capital costs | ability to pay for implementation within context of regional needs | Financial Feasibility |
| annual O&M costs | | |
| % regional funds needed | | |
| qualitative with 0-5 ranking based on what type of improvements might obtain funds or in-kind contributions | feasibility of alternative revenue sources | |
| qualitative with 0-5 ranking based on possible private sector valuation of its ROI | potential for private sector participation | |
| annualized life-cycle costs per reduced person-hour of travel | cost effective investment | Cost Effectiveness |
| annualized life-cycle costs per reduction in delay | | |
| cost per new daily transit rider | | |
| annualized economic cost to society | total costs to society | |
| weighted average travel time for non-car-owning | proportions benefits fairly | Equity |
| of dwellings taken, percent that are low-income | proportions impacts fairly | |

**7.1.1.4 Relative Weighting of Evaluation Criteria**. It was recognized that each individual might well place a somewhat different value on each of the evaluation criteria, and that therefore a mechanical averaging process could not be used to reduce the scores for the 32 evaluation criteria to scores for the 11 evaluation categories.

To allow the aggregation of the 32 criteria scores into a single score for each of the evaluation categories in a manner that reflected the values of the Consultant study team, a relative weighting process was used. Each individual member of the Consultant study team developed a personal percentage weighting value for each of the evaluation criteria within each category. The personal weighting percentages were then averaged to yield an overall Consultant study team weighting for each evaluation criteria. These weightings were then applied to the evaluation criteria scores to produce weighted scores for each of the eleven evaluation categories. Details of this process and the actual percentage weightings used are presented in ***Technical Memorandum 5G, Evaluation of Alternatives Methodology.***

**7.1.1.5 Relative Weighting of Evaluation Categories.** The preceding steps in the evaluation process resulted in a set of eleven scores (one in each of the eleven evaluation categories) for each of the ten Strategy Sets. The weighting process was then repeated in similar fashion for the eleven evaluation categories, resulting in a final numeric score for each of the ten Strategy Sets, with the highest score indicating the "better" Strategy Set for addressing the transportation problems and issues -- based solely on the average relative weights assigned.

The results of this process, as presented to the Study Management Group, are shown in the table (Table 7-2) on the following page. While this approach resulted in a single numeric solution, it is of course highly dependent upon the relative values placed on each of the evaluation criteria.

The weighted score approach described above does permit an enormous amount of diverse data to be translated into a single numeric score. This may be a useful tool in a decision-maker's tool box, but it may also not be either the only tool or the most appropriate to the job at hand. A single weighted score may mask specific issues or details that are seemingly contained in a performance measure, or criterion. The results of this structured evaluation process, shown in the following table, were made available to the members of the Cross-County Corridor Study Management Group in their decision-making process, which is described in Section 8 of this report. Viewed only in the context of this table, which summarizes the process thus far, Strategy Set No. 10 would appear to be the "most responsive" to the transportation problems and issues in the Corridor, while Strategy Set No. 1 would be the "least responsive."

### 7.1.2 Key Strategy Set Comparisons

In addition to evaluating the Strategy Sets using a weighted scores process as described above, comparative data on key performance indicators and important identified public issues was also presented to the Study Management Group for their review and evaluation. The following table presents a summary of the key comparisons for the ten Strategy Sets which were evaluated by the SMG.

**Table 7-2**

**Summary of Weighted Scores**

| Evaluation Category | Strategy Set | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** |
| Community & Regional | 0.32 | 0.31 | 0.33 | 0.30 | 0.31 | 0.33 | 0.24 | 0.32 | 0.3 | 0.26 |
| Traffic Congestion | 0.09 | 0.18 | 0.22 | 0.31 | 0.32 | 0.25 | 0.40 | 0.36 | 0.35 | 0.45 |
| Accessibility | 0.13 | 0.11 | 0.23 | 0.21 | 0.26 | 0.24 | 0.29 | 0.27 | 0.3 | 0.36 |
| Mobility | 0.08 | 0.33 | 0.43 | 0.33 | 0.43 | 0.46 | 0.43 | 0.49 | 0.5 | 0.55 |
| Neighborhood Concerns | 0.38 | 0.30 | 0.30 | 0.25 | 0.25 | 0.30 | 0.26 | 0.25 | 0.2 | 0.25 |
| Noise & Air Quality | 0.17 | 0.19 | 0.19 | 0.13 | 0.13 | 0.19 | 0.10 | 0.13 | 0.1 | 0.12 |
| Natural Environment | 0.25 | 0.23 | 0.22 | 0.13 | 0.13 | 0.20 | 0.14 | 0.12 | 0.1 | 0.12 |
| Safety & Security | 0.15 | 0.15 | 0.15 | 0.15 | 0.16 | 0.15 | 0.12 | 0.14 | 0.1 | 0.14 |
| Financial Feasibility | 0.22 | 0.30 | 0.33 | 0.29 | 0.31 | 0.31 | 0.29 | 0.28 | 0.3 | 0.28 |
| Cost-Effectiveness | 0.25 | 0.18 | 0.31 | 0.34 | 0.33 | 0.23 | 0.34 | 0.32 | 0.2 | 0.25 |
| Equity | 0.15 | 0.20 | 0.20 | 0.16 | 0.16 | 0.22 | 0.21 | 0.17 | 0.1 | 0.23 |
| **Total** | **2.19** | **2.48** | **2.91** | **2.60** | **2.79** | **2.87** | **2.81** | **2.84** | **2.8** | **3.02** |

The performance indicators presented in Table 7-3 were selected to provide a comparison among the Strategy Sets of how each addressed the key problems and issues highlighted earlier in the study. The above indicators provide objective projections of how each Strategy Set will contribute to community and regional viability, reduce traffic congestion, improve accessibility to major attractions in the study area, and improve mobility for residents of this portion of the region among other issues. Metrics are also included which indicate the social and environmental impacts each Strategy Set would involve, as well as indications of the financial feasibility, cost effectiveness, and equity of each of the alternative Strategy Sets.

**Table 7-3**

**Comparison of Key Performance Indicators**

| Performance Measures | Strategy Set 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Reduction in Person Hours of Delay (daily, in 1,000's) | 3.8 | 0.3 | 7.7 | 12.3 | 11.7 | 8.2 | 12.8 | 10.2 | 12.6 | 13.3 |
| % Reduction in Auto Travel Times to Major Destinations | 0.1 | 1.4 | 1.1 | 1.9 | 1.7 | 1.3 | 3.1 | 3.0 | 2.0 | 3.2 |
| % Reduction in Transit Travel Times to Major Destinations | -2.0 | -1.9 | -1.5 | -1.8 | -1.5 | -1.1 | -0.5 | 0.5 | 0.5 | 2.3 |
| % Reduction in Transit Travel Times to Major Destinations Weighted for Low Auto Ownership | -0.5 | 2.4 | 2.6 | 2.5 | 2.7 | 2.3 | 2.6 | 3.4 | 3.7 | 4.2 |
| # of New Hwy | 0 | 0 | 0 | 3 | 3 | 0 | 6 | 3 | 3 | 6 |
| # of Reconstructed Highway Interchanges | 0 | 17 | 17 | 17 | 17 | 17 | 18 | 18 | 17 | 18 |
| New Highway Lane | 3.7 | 22.6 | 22.6 | 57.9 | 50.5 | 22.6 | 121.0 | 71.2 | 57.9 | 121.0 |
| % of Vehicle Miles Traveled @ Level of Service E or F | 1.45 | 1.55 | 1.44 | 1.47 | 1.44 | 1.44 | 1.44 | 1.41 | 1.48 | 1.45 |
| New Rail Transit Stations | 0 | 7 | 12 | 7 | 12 | 17 | 12 | 17 | 24 | 24 |
| New Rail Transit | 0 | 4.4 | 8.9 | 4.4 | 8.9 | 18.4 | 8.9 | 13.9 | 19.2 | 28.7 |
| Daily Rail Transit Boardings (in thousands) | 62.8 | 75.4 | 87.1 | 77.1 | 87.1 | 97.0 | 84.8 | 94.7 | 109.8 | 106.6 |
| Daily Bus Boardings | 151.0 | 143.1 | 141.4 | 143.3 | 141.3 | 138.5 | 137.5 | 131.3 | 133.8 | 130.1 |
| Daily Transit Linked | 146.2 | 149.4 | 161.2 | 149.8 | 156.2 | 159.7 | 155.3 | 158.2 | 163.6 | 161.2 |
| Residential Relocations | 1 | 101 | 101 | 118 | 118 | 102 | 402 | 119 | 125 | 409 |
| Commercial Relocations | 14 | 22 | 31 | 52 | 61 | 37 | 106 | 67 | 77 | 122 |
| Parkland Takings (acres) | 1.6 | -5.0 | -5.0 | 8.3 | 8.3 | -5.0 | -2.0 | 8.3 | 9.3 | -1.0 |
| Total R/W Acquisitions | 15.0 | 41.3 | 59.4 | 126.2 | 138.8 | 107.2 | 351.4 | 194.8 | 253.9 | 461.0 |
| Noise-Impacted Residences | 0 | 0 | 0 | 1357 | 1357 | 0 | 2511 | 1447 | 1357 | 2511 |
| Reduction in Air Quality Emissions (tons per day) | 1.2 | 0.8 | 1.2 | 1.4 | 1.7 | 1.7 | 1.2 | 2.3 | 2.5 | 1.9 |
| Total Capital Cost ($M) | 95 | 796 | 977 | 1,245 | 1,421 | 1,272 | 1,737 | 1,752 | 2,111 | 2,421 |
| Annual Operating Cost ($M) | 29.6 | 39.5 | 43.0 | 39.7 | 43.2 | 48.3 | 43.6 | 48.7 | 55.4 | 55.8 |
| Capital Cost for Each Person-Hour of Travel Time Savings per Year ($) | 70 | 223 | 501 | 246 | 327 | 815 | 284 | 458 | 933 | 437 |
| Transit Cost Effectiveness Index (a) | 1.75 | 14.13 | 8.81 | 13.52 | 11.83 | 14.89 | 12.61 | 16.23 | 18.08 | 20.26 |

(a) The Transit Cost Effectiveness Index is defined here as the change in total annualized capital and O&M costs divided by the change in annual transit ridership (in linked trips) compared to the No-Build scenario, as described in FTA's proposed changes to Section 5309, New Starts Criteria.

## 7.2 COMPARISON OF DISCRETE STRATEGIES

The ten Strategy Sets were constructed of specific combinations of discrete strategies. Any number of additional Strategy Sets could have been generated by even more combinations and permutations of candidate, discrete strategies.

For the Study Management Group and the entire Study Team, clear patterns of impacts — both positive and negative — emerged from the relative measures of performance. Some measures are nearly independent of conventional multi-modal interaction (e.g., right of way acquisition), and thus can only be assessed in the context of the relative size of a measure's metric (e.g., reduction in auto (or transit) travel times to major destinations).

Using the described evaluation methodology, the Study Management Group isolated the best performing Strategy Sets and weighed community sentiments toward components of the best performing Strategy Sets.

Table 7-4, beginning on the following page, presents comparisons of key measures for the major components, or discrete strategies, which were encompasssed by one or more of the best performing Strategy Sets

**Table 7-4**
**Summary Comparison of Discrete Strategies**

**North Subcorridor**
**Discrete Strategy B: Reconstruct I-170 Interchanges and Pavement Replacement**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability*** | |
| • R/W Required (acres) | 20 |
| • Businesses Displaced | 3 |
| ***Congestion*** | |
| • Capacity | The combination of this strategy and TSM improves the ability of traffic to enter and exit the highway thereby improving operation and capacity of the highway. |
| • Level of Service (Highway) | There will be an improvement to the level of service in the evening peak south of Olive with this strategy. In the morning peak, the level of service stays the same as a no-build condition. The design hourly volume that use the highway increase with this strategy. |
| • Level of Service (Arterials) | In the morning peak, the effects of this strategy are operational improvements to Hanley Road by an entire level of service. In the evening peak, there are no improvements to the level of service on Hanley. There are only minimal decreases to traffic using this arterial from the no-build condition. |
| ***Neighborhoods*** | |
| • Residential Displacements | 33 |
| • Community Facilities Displaced | 1 |
| • Parkland Taken (acres) | 0 |
| ***Safety and Security*** | |
| • Eliminates highway hazards | This strategy improves the operation at interchanges by eliminating hazards at weaving and merge areas such as substandard acceleration lanes. Elimination of loop ramps in specific areas will also improve safety. |
| ***Capital Cost*** | $160.3 million |

**North Subcorridor**
**Discrete Strategy C: Add Highway Lanes, I-170**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability*** | |
| • R/W Required (acres) | 2.7 |
| • Businesses Displaced | 0 |
| ***Congestion*** | |
| • Increase in Capacity | The additional highway lanes (or HOV lane for Strategy Sets 7&10) would increase the capacity of I-170. |
| • Level of Service (Highway) | The level of service on I-170, with the highway widening, will improve by a level of service in the morning peak south of Olive. It will also improve the evening peak south of Olive by two levels of service, while the level of service south of I-270 would remain the same as a no-build condition. |
| • Level of Service (Arterials) | The level of service on Hanley would improve by a level of service in the morning peak hour with this strategy. The evening peak hour level of service does not improve with this strategy. |
| ***Neighborhoods*** | |
| • Residential Displacements | 0 |
| • Community Facilities Displaced | 0 |
| • Parkland Taken (acres) | 0 |
| ***Safety and Security*** | |
| • Eliminates highway hazards | This strategy improves the safety of I-170 by eliminating weaving problems and improving the operation of the roadway. |
| ***Capital Cost*** | $30.5 million |

**North Subcorridor**
**Discrete Strategy D: Rail Transit Extension**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability***<br>• R/W Required (acres)<br>• Businesses Displaced | 61.8<br>10 |
| ***Congestion*** | Minor benefits to arterials and highways. |
| ***Access***<br>• Added Transit Stations | 7 |
| ***Mobility***<br>• Daily ridership added to the existing system in 2015 | 15,100 additional daily rail transit riders (assumes rail extensions in east and south corridors) |
| ***Neighborhoods***<br>• Residential Displacements<br>• Community Facilities Displaced<br>• Parkland Taken (acres) | 6<br>3<br>1.0 |
| ***Noise***<br>• Added housing units above 65 dB | There are no units estimated to be impacted above 65 dB due to MetroLink operations. |
| ***Capital Cost*** | $397.2 million |

**North Subcorridor**
**Discrete Strategy E: Add Highway Lanes and Rail Transit Extension**

| Problems/Issues | Impacts |
|---|---|
| | Impacts of this multimodal strategy would generally consist of the sum of the impacts of Discrete Strategies C and D, above. |
| ***Capital Cost*** | $427.7 million |

**South Subcorridor**
**Discrete Strategy F: New Parkway, I-64 to I-44**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability*** | |
| • R/W Required (acres) | 34-91 acres |
| • Businesses Displaced | 43-48 businesses |
| ***Congestion*** | |
| • Level of Service (Highway) | Adverse impact on I-170 south of Olive and minor impact on I-64 west of I-170 due to traffic reassignment to I-170 from I-70 and I-270. |
| • Level of Service (Arterials) | Significant benefit for arterials north of I-44, adverse impact on arterials south of I-44. |
| ***Access*** | Generally improved travel times for intra-county travel, especially for southwest county locations. |
| ***Neighborhoods*** | |
| • Residential Displacements | 12-63 homes |
| • Community Facilities Displaced | 0 |
| • Parkland Taken (acres) | 1-15 acres |
| ***Noise*** | |
| • Added housing units above 65 dB | 1,357 homes |
| ***Capital Cost*** | $522.1 million |

**South Subcorridor**
**Discrete Strategy G: New Highway, I-64 to I-55**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability*** | |
| • R/W Required (acres) | 281-287 acres |
| • Businesses Displaced | 88-94 businesses |
| ***Congestion*** | |
| • Level of Service (Highway) | Adverse impact on I-170 south of Olive and on I-64 west of I-170 due to traffic reassignment to I-170 from I-70 & I-270. |
| • Level of Service (Arterials) | Significant operational benefit to a majority of south arterials. |
| ***Access*** | Generally improved travel times for the greater south county area, as well as for south St. Louis City, and Jefferson County. |
| ***Neighborhoods*** | |
| • Residential Displacements | 98-195 homes |
| • Community Facilities Displaced | 1-3 |
| • Parkland Taken (acres) | 5-27 acres |
| ***Noise*** | |
| • Added housing units above 65 dB | 2,511 homes |
| ***Capital Cost*** | $763.2 million |

**South Subcorridor**
**Discrete Strategy H: Parkway Extension, River Des Peres Parkway to Big Bend**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability*** | |
| • R/W Required (acres) | 15 acres |
| • Businesses Displaced | 14 |
| ***Congestion*** | |
| • Level of Service (Highway) | Operational improvements experienced on Shrewsbury with extension of River Des Peres Boulevard. There is also evidence to suggest that the congestion on Hanley and Big Bend would be "balanced-out" by this strategy. |
| • Level of Service (Arterials) | |
| ***Access*** | A more efficient arterial street connection between north and south of I-44. |
| ***Neighborhoods*** | |
| • Through Traffic | Reduces through traffic in Shrewsbury residential neighborhoods. |
| • Residential Displacements | 1 home |
| • Community Facilities Displaced | 1 facility |
| • Parkland Taken (acres) | 2 acres |
| ***Noise*** | |
| • Added housing units above 65 dB | None |
| ***Capital Cost*** | $50.3 million |

**South Subcorridor**
**Discrete Strategy I: Rail Transit Extension, Clayton to I-44**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability*** | |
| • R/W Required (acres) | 18.1 |
| • Businesses Displaced | 9 |
| ***Congestion*** | Minor benefits to arterials and highways. |
| ***Access*** | |
| • Added Transit Stations | 5 |
| ***Mobility*** | |
| • Daily ridership added to the existing system in 2015 | 11,600 additional daily rail transit riders (assumes rail extension in east subcorridor). |
| ***Neighborhoods*** | |
| • Residential Displacements | 0 |
| • Community Facilities Displaced | 0 |
| • Parkland Taken (acres) | 0 |
| ***Noise*** | |
| • Added housing units above 65 dB | There are no units estimated to be above 65 dB due to MetroLink operations. |
| ***Capital Cost*** | $182.7 million |

**South Subcorridor**
**Discrete Strategy J: Rail Transit Extension, I-44 to Butler Hill Road**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability***<br>• R/W Required (acres)<br>• Businesses Displaced | 47.8<br>6 |
| ***Congestion*** | Minor benefits to arterials and highways. |
| ***Access***<br>• Added Transit Stations | 5 |
| ***Mobility***<br>• Daily ridership added to system in 2015 | 9,900 additional daily rail transit riders (assumes rail extension in east and south to I-44). |
| ***Neighborhoods***<br>• Residential Displacements<br>• Community Facilities Displaced<br>• Parkland Taken (acres) | 1<br>0<br>0 |
| ***Noise***<br>• Added housing units above 65 dB | There are no units estimated to be above 65 dB due to MetroLink operations. |
| ***Capital Cost*** | $298.9 million |

**South Subcorridor**
**Discrete Strategy K: Add New Parkway and Rail Transit Extension, I-64 to I-44**

| Problems/Issues | Impacts |
|---|---|
| | Impacts for this multimodal strategy are generally equal to the combined impacts of Discrete Strategies F and I above. |
| ***Capital Cost*** | $704.8 million |

**South Subcorridor**
**Discrete Strategy L: Add New Freeway and Rail Transit Extension, I-64 to I-55**

| Problems/Issues | Impacts |
|---|---|
| | Impacts for this multimodal strategy are generally equal to the combined impacts of Discrete Strategies G, I, and J. |
| ***Capital Cost*** | $1,244.8 million |

**East Subcorridor**
**Discrete Strategy M: Reconstruct I-64 Interchanges**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability*** | |
| • R/W Required (acres) | 13 |
| • Businesses Displaced | 1 |
| *Congestion* | |
| • Increases capacity | There is an approximate 12% increase in the vehicular capacity of I-64 by improving interchanges and auxiliary lanes. By implementing these strategies plus ramp metering, the operational improvements will yield an increase in capacity of approximately 20%. There will be a decrease in the traffic demand using the adjacent parallel arterials such as Clayton Road and Forest Park Parkway due to the increase in I-64 throughput and increased travel speeds. |
| • Level of Service (Highway) | The morning peak hour traffic will operate at the same level of service as the no-build condition except between McCausland and Clayton where the highway will drop a level of service due to an approximate 15% increase in demand. In the evening peak hour, the level of service on I-64 improves between Big Bend and I-170 and between Grand and Kingshighway, but again at Oakland, the highway will drop a level of service. |
| Level of Service (Arterials) | The increase in traffic using I-64 will decrease the traffic using the nearby arterials such as Clayton Road and Forest Park Parkway. The evening peak hour level of service on Clayton and Manchester improves from a no-build condition, while Forest Park Parkway remains at the same service level. The level of service for all east-west routes remains the same as the no-build in the morning peak hour. |
| ***Neighborhoods*** | |
| • Residential Displacements | 55 |
| • Community Facilities Displaced | 1 |
| • Parkland Taken (acres) | -8.5 (land returned to Forest Park) |
| ***Safety and Security*** | |
| • Eliminates highway hazards | This strategy significantly improves substandard roadway features such as lateral and vertical clearances to Interstate standards, which will improve the safety for traffic using I-64. The strategy will improve operations on I-64 by allowing adequate weaving for entering and exiting traffic at closely-spaced interchanges and will also improve existing merging problems relating to short acceleration distances. |
| ***Noise*** | |
| • Added units over 65 dBA | There were no additional residences in this corridor that will be above 65 dBA that are not presently at or above this level. Detailed noise analysis would be done if the strategy carries forward to address these impacts. |
| ***Capital Cost*** | $184.7 million (with no southern extension of I-170) |

**East Subcorridor**
**Discrete Strategy N: Rail Transit Extension to Clayton**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability***<br>• R/W Required (acres)<br>• Businesses Displaced | (Specific impacts depend on which of four alignment options is selected.)<br>4.7-8.2<br>0 |
| ***Congestion*** | Minor benefits to arterials and highways. |
| ***Access***<br>• Added Transit Stations | 4-8 |
| ***Mobility***<br>• Daily ridership added to the existing system in 2015 | 13,200 additional daily rail transit riders (based on the through-the-Park option, N.2). |
| ***Neighborhoods***<br>• Residential Displacements<br>• Community Facilities Displaced<br>• Parkland Taken (acres) | 0-8<br>2-7<br>0-4.5 |
| ***Noise***<br>• Added housing units above 65 dB | There are no units estimated to be impacted above 65 dB due to MetroLink operations. |
| ***Capital Cost*** | $275.0 million (average of 4 options) |

**West Subcorridor**
**Discrete Strategy O: Reconstruct I-64 Interchanges**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability*** | |
| • R/W Required (acres) | 4 |
| • Businesses Displaced | 5 |
| ***Congestion*** | |
| • Increase in Capacity | There is an increase in capacity to I-64 with this strategy due to the operational improvements, see Discrete Strategy M. |
| • Level of Service (Highway) | The increase in I-64 throughput and travel speeds with this strategy attract enough additional traffic to cause the levels of service for this strategy to remain the same as in the no-build condition in both the morning and afternoon peaks |
| • Level of Service (Arterials) | The increase in traffic using I-64 will decrease the traffic using Clayton Road with this strategy but it is not enough to improve the level of service by a whole grade. |
| ***Neighborhoods*** | |
| • Residential Displacements | 11 |
| • Community Facilities Displaced | 1 |
| • Parkland Taken (acres) | 0 |
| ***Safety and Security*** | |
| • Eliminates highway hazards | There is a significant improvement in safety with this strategy by improving substandard roadway features such as lateral and vertical clearances and upgrading to Interstate standards. The strategy will improve existing merging problems relating to short acceleration distances. |
| ***Noise*** | |
| • Added units above 65 dBA | There were no additional residences in this corridor that will be above the 65 dBA that are not presently at or above this level. Detailed noise analysis would be done if the strategy carries forward to address noise impacts. |
| ***Capital Cost*** | $88.4 million |

**West Subcorridor**
**Discrete Strategy P: Add I-64 Highway Lanes**

| Problems/Issues | Impacts |
|---|---|
| ***Community Viability*** | |
| • R/W Required (acres) | 5.6 |
| • Businesses Displaced | 0 |
| ***Congestion*** | |
| • Increase in Capacity | There will be an improvement in capacity on I-64. |
| • Level of Service (Highway) | There is improvement in the operation of the highway in the evening peak by one level of service with this strategy. The morning level of service remains the same due to the increase in I-64 throughput and travel speeds. In all cases, the capacity on I-64 is increased when lanes are added in this subcorridor. |
| • Level of Service (Arterials) | The increase in traffic using I-64 will decrease the traffic that will use Clayton Road but not enough to change the rating of the level of service on this arterial. |
| ***Neighborhoods*** | |
| • Residences Displaced | 0 |
| • Community Facilities Displaced | 0 |
| • Parkland Taken (acres) | 0 |
| ***Safety and Security*** | |
| • Eliminates highway hazards | This strategy will provide an improvement to safety by improving the weaving and merging conditions in this subcorridor and reducing its effects on through traffic. |
| ***Noise*** | |
| • Added units over 65 dBA | There were no additional residences in this corridor that will be impacted above the 65 dBA that are not presently at or above this level. Detailed noise analysis would be done if the strategy carries forward to address noise impacts. |
| ***Capital Cost*** | $5.9 million |

## 8.0 FINDINGS AND RECOMMENDATIONS

The structure of the Cross-County Corridor MTIA placed the responsibility for policy level decisions with the project's Study Management Group (SMG), comprised of local, state and federal representatives. This structure was determined and implemented by the sponsoring agencies, prior to the selection of the study consultant. Agencies and organizations represented on the SMG are listed below. In a letter to the sponsoring agencies dated February 11, 1997, the FTA requested their agency be listed as "ex-officio" with the reason given that federal agencies do not participate in the local decision-making process.

- St. Louis County
- St. Louis City
- St. Louis County Municipal League
- Citizens for Modern Transit
- Regional Commerce and Growth Association
- East-West Gateway Coordinating Council
- Missouri Department of Transportation
- Bi-State Development Agency
- Missouri Department of Natural Resources
- Federal Highway Administration
- Federal Transit Administration
- U.S. Environmental Protection Agency

At the conclusion of the MTIA process, it was the task of the Study Management Group to make a final recommendation to the East-West Gateway Coordinating Council's Board of Directors regarding the Cross-County Corridor MTIA strategies that should be included in the region's long range transportation plan, Transportation Redefined. In making these decisions, the SMG took into account how each of the Strategy Sets addressed the transportation goals and objectives at the national, regional, and local levels. As identified in Transportation Redefined, these goals and objectives were grouped for decision-making purposes into seven focus areas: 1) preservation of existing infrastructure, 2) safety and security in travel, 3) congestion management, 4) access to opportunity, 5) sustainable development, 6) the efficient movement of goods, and 7) resource conservation.

### 8.1 STUDY MANAGEMENT GROUP MEETINGS

In order to allow the SMG members to make an informed decision, two working meetings of the SMG were held to brief the group on the study findings. On January 7, 1997, a presentation was made by the Consultants which reviewed the purpose of the Cross-County Corridor MTIA, the Problem Statement developed as a result of the information gathered by the study team, and strategies reviewed and eliminated during

Phase 1 of the MTIA. Each of the discrete strategies studied in Phase 2 were presented, as well as pertinent information relative to each strategy set. Information presented included a description of each strategy set; computer-generated renderings for at least one strategy in each subcorridor which showed how the strategy might appear, along with a "before" photo of the actual location; problems and issues addressed by the strategy; known constraints (such as property-specific limitations) or issues that may develop as a result of the strategy (displacements); and typical cross-sections of the various strategies which were studied. Background documents were also made available to the group for their review. These included evaluation and comparison results for each strategy set for criteria such as number of potential displacements, noise impacts, floodplain encroachments, air quality impact, cost, and financial feasibility analysis results. This information can be found in Technical Memorandum 6, Evaluation and Comparison of Alternatives.

The entire meeting was videotaped by the Missouri Department of Transportation, with copies provided to cable station outlets in St. Louis City and County. In addition, the entire video was played at the public open house meeting on January 22, 1997, to provide members of the general public the same information presented to the SMG, as well as allowing them the benefit of hearing the discussion among SMG members as the information was presented.

After the members had time to review and discuss the study results with their respective agencies/organizations, the group was reconvened on February 25, 1997, to allow questions to be asked and clarifications given. The group also discussed the manner in which consensus on the recommendation would be reached. Updated summaries of the structural evaluation results (described in Section 7 of this report) were provided to the SMG at this meeting.

## 8.2 STUDY MANAGEMENT GROUP RECOMMENDATION

The SMG met on March 24, 1997, at the East-West Gateway Coordinating Council office to make a recommendation on the proposed alternatives. Members came to the meeting, well aware of the various public views on the strategies. At the public open house held on January 22, names and addresses of SMG members were made available to individuals wanting to communicate directly with the decision-makers their positions on the various strategies. Consequently, many interests (both pro and con for specific strategies) employed targeted "lobbying" of many, if not all, of the SMG members. To complement the direct information received from the public, two handouts developed by the study managers from East-West Gateway and the Missouri Department of Transportation were provided to members. Both of these handouts are contained in Appendix B of this document.

The first study manager's handout, "Timelines for Projects Developed from Strategies," showed in tabular form each improvement by subcorridor, and how long it was estimated the improvement would take to develop and construct. These timelines were a factor of reasoned assessments of financing, developmental planning, design and (as

required) right-of-way acquisition, and construction durations. In a very real sense, these timelines evidenced for the SMG decision-makers a practical measure of when the variety of proposed alternatives might (if at all) be in place to generate ultimate, forecasted impacts on the transportation system and the communities this system serves. Concurrently, this information provided a basis for the SMG to assess the relative financial capacity of the region to implement strategies. Given competing transportation projects elsewhere in the region (i.e., outside the Cross-County Corridor) and the uncertainties associated with probable sources of (local, state and federal) funds, the SMG had another tool by way of these timelines to gauge the short- and long-range project implementation possibilities of Discrete Strategies.

The second handout provided to SMG members contained staff recommendations on specific Discrete Strategies. Along with these recommendations and serving as bases for same, this handout outlined in which subcorridor(s) the strategy applied, a description of the improvement, cost factors, and indicators of how well the strategies addressed the problems and issues identified through the study process. The quantitative and qualitative data contained in this second handout was derived from (or, in some cases, is identical to) the tabulations presented in Section 7 of this Final MTIA Report, and/or the results of the evaluation and comparisons of the Strategy Sets and the Discrete Strategies found in Technical Memorandum No. 6.

Members of the SMG decided to vote to accept the staff recommendations as the SMG's recommendation, with each member having the opportunity to provide footnotes on specific strategies if they desired. Having all agreed to this process, the SMG unanimously approved that the following strategies for the Cross-County Corridor MTIA be recommended to the Board of Directors of the East-West Gateway Coordinating Council for inclusion in the region's long-range plan. The adopted strategies are shown on Figure 8-1 on the following page.

**Cross-County Corridor**
Major Transportation Investment Analysis

# Adopted Strategies

**Figure 8-1**

LEGEND

- Interchange Improvements
- Interstate Widening
- Rail Transit Extension
- Existing MetroLink
- Existing Interstate Highways

## General Strategy/Location Table

| General Strategy/Location | Description | Basis for Decision |
|---|---|---|
| Roadway Improvements North Subcorridor | * I-170 interchange improvements at I-64 to north of Page Ave. and at I-270, including:<br><br>- Forest Park Pkwy<br>- Ladue Road<br>- Delmar Blvd.<br>- Olive Street<br>- Page Avenue<br><br>* Add new highway lanes from Scudder Road north to I-270. | I-170/I-64 interchange is considered to be woefully inadequate to handle the volume of traffic currently using and projected to flow through this major crossroads. Immediate intersection roadways and adjacent intersection roadways (north on I-170 through Page Avenue and east on I-64 through Hanley Road) can be replaced with resultant improvement in highway and ramp capacities, highway hazard elimination, reduced travel time and delays, and enhanced accessibility for commercial and office land uses. Given available right-of-way and current land uses, minimal impacts on neighborhoods and community facilities can be achieved within the candidate design options. However, it should be noted that the official position of the City of Richmond Heights is to not support any improvements which would negatively impact any neighborhood.<br><br>The I-170/I-64 interchange has been viewed as a major bottleneck in the system by both the general public and their elected officials for more than a decade. The existing performance measures bear this assessment out, and the positive impacts of the proposed improvements weigh heavily in warranting these as priorities for the region. |

| General Strategy/Location | Description | Basis for Decision |
|---|---|---|
| Roadway Improvements East Subcorridor | * I-64 interchanges from I-170 to Laclede Station Road, with collector distributor roads.<br><br>* I-64 interchanges from Laclede Station Road to McCausland, with auxiliary lanes.<br><br>* I-64 interchange improvements at Hampton and Kingshighway<br><br>* Pavement replacement and auxiliary lanes from Kingshighway to Tower Grove.<br><br>* Replace several existing bridges over I-64. | Virtually all of these interchanges have outdated geometries for the volume and speed of current and projected traffic. Mainline (I-64) and ramp speeds, travel times and highway hazard reduction can be noticeably improved with these interchange and collector distributor roadway alterations and resultant capacity increases. In tandem are improved accessibility for commercial and other land uses to the north and south of I-64, and reduction in through traffic in residential neighborhoods due to reduced congestion along I-64 and at interchanges.<br><br>It has long been recognized by the general public and their elected officials that this stretch of I-64 needed significant upgrading of capacity on the mainline roadway (I-64) and at most, if not all, interchanges. Previous studies had looked at total widening of I-64 between I-170 and Vandeventer, only to see such levels of roadway expansion vehemently opposed by adjacent communities.<br><br>Taking of parkland in Forest Park was especially viewed as unacceptable result. The proposal as it exists provides a significantly reduced negative impact on those same communities; it is achievable by incremental project advancement; and it will achieve nearly the same overall benefits to this stretch of I-64 and the transportation system. A major component of the proposal which is viewed as being extremely positive is the design concepts for the interchanges which, in fact, "give back parkland" to Forest Park.<br><br>Richmond Heights and the McCausland/Oakland neighborhoods, however, will remain protective of their neighborhoods. Close coordination with them will be critical in the design phase. |

| General Strategy/Location | Description | Basis for Decision |
|---|---|---|
| Roadway Improvements West Subcorridor | * I-64 highway interchanges and pavement replacement west of I-170 to Spoede Road.<br><br>* Add new highway lanes along I-64 from I-170 to Spoede. | As I-64 interchanges east of I-170 are geometrically outdated, so too are those interchanges west to Spoede Road. The current lane drop on I-64 at Spoede can be eliminated by constructing one lane in each direction between Spoede and Brentwood, with little impact on existing neighborhoods or community facilities. Overall roadway and interchange capacity will be increased, with improved roadway safety, decreased travel times and delays, and reduced congestion the result.<br><br>Generally considered by the general public to be necessary improvements that will far exceed the modest costs in residential displacements and business displacements. Those living closest to the interchanges, or those who would be directly impacted will be less supportive. When viewed together with the I-170/I-64 interchange improvement, and proposed interchange improvements from I-170 east, the system benefits of these recommended west subcorridor highway and interchange projects are considered even more beneficial. |

| General Strategy/Location | Description | Basis for Decision |
|---|---|---|
| Roadway Improvements South Subcorridor | **Not recommended:** Extension of I-170 South as a highway or parkway; parkway connection between Big Bend and River Des Peres Blvd. | Adding a parkway or an interstate highway to connect I-64 to either I-44 or I-55, or both, would entail substantial right-of-way acquisition with concommitant residential, commercial and community facilities displacements. Operational improvements on existing arterials (due to traffic reassignment to highway), reduced travel times for south county residents would, however, result from such highway alternatives.<br><br>Regardless of the apparent positive results from such highway options, even the short connection of River Des Peres Boulevard to Big Bend and I-44 the general public expressed overriding concern for the quantified and unquantified negative impacts on neighborhoods, noise levels, community viability (due to highway "barriers"), and real estate values. Considering the sentiments of the public impacted there was insufficient political will to pursue these highway options further. |

Footnotes to Roadway Improvements:

1. Larry Mooney, St. Louis County, emphasized the need to minimize residential displacements, citing the number of "worse case scenario" figures for improvements to the interchanges of Ladue and Forest Park Parkway and I-170. He felt that those two locations, especially, need to be reviewed and displacements minimized to the extent possible.

2. Jim Farrell, RCGA, raised concern about I-64, east of Oakland, remaining 6 lanes and suggested that MoDOT review that section in the design stage where the highway drops from 8 to 6 lanes causing rush hour bottleneck.

3. David Edwards, Federal Highway Administration, voiced concern that even if I-170 is not extended now, the region needs to be open to considering it again in the future if conditions merit it.

| General Strategy/Location | Description | Basis for Decision |
|---|---|---|
| Transportation System Management (TSM)<br>All Subcorridors | Transportation management techniques to reduce congestion and to make better use of the existing systems<br><br>• arterial street improvements<br><br>• bridge reconstruction<br><br>• improvements to bus service<br><br>• traffic control measures<br><br>• ramp metering<br><br>• incident management systems | Generally, the full range of TSM approaches appear to positively impact transportation problems and issues. None of the approaches in themselves, or even taken together where they can be applied, reveal as significant the impacts to be derived from several build options. But, particularly on major arterials in the corridor and within the existing bus system, implementing TSM projects appears to lead to meaningful improvements with few negative impacts.<br><br>Public sentiment toward TSM options runs high, and the various TSM techniques that may fit each subcorridor should be fully evaluated. In the south subcorridor, there will be, in the absence of new highways, the opportunity to achieve travel enhancements with TSM that could quickly pay dividends for south county and south St. Louis city publics. |

Footnotes Regarding TSM's

1. Tim Fischesser, St. Louis County Municipal League, requested that TSM techniques be reviewed to address the problems of southbound traffic on I-170 at the Brentwood Blvd. ramp in terms of it's relationship with Clayton Road.

2. Lars Etzkorn, St. Louis Development Corp., expressed importance of developing TSM's to address needs on River Des Peres Blvd. and Manchester Road.

3. Tim Fischesser wanted to be certain that the TSM strategy in the south subcorridor be looked at closely given the fact that the SMG did not recommend extending I-170. Special attention should be given to the arterials in terms of applying different types of operational improvements.

4. Larry Mooney expressed need to address mobility issues in the south subcorridor since the extension of I-170 is off the table.

| General Strategy/Location | Description | Basis for Decision |
|---|---|---|
| Rail Transit<br><br>North, South and East Subcorridors | * Light rail was recommended to extend from the existing line into Clayton and south to I-55, as the first priority.<br><br>* The north rail extension was recommended as Stage II. | Lack of competitive (to auto) transit service in each subcorridor bodes ill for reducing commuter travel by private auto to Clayton, Downtown St. Louis and other major activity centers (civic, educational, recreational). Air quality, congestion and accident costs will be negatively impacted without suitable transit service to serve both transit dependent and choice rider populations.<br><br>Available rights-of-way can permit rail transit to be implemented without major property acquisition and dislocation of residences or businesses. Station areas in numerous communities can enhance economic development and revitalize stagnant (or diminishing) economies of inner-most suburbs. Access by inexpensive public transit to key peak and off-peak regional destinations can reduce reliance on private auto and begin to pay dividends with less auto trips being made.<br><br>It should be noted that rail transit in the south was supported by elected officials and citizens as a preferred alternative to a new highway. Even so, concerns were raised relative to displacements and the perception of rail dividing neighborhoods by many. |
| Rail Transit<br>West Subcorridor | No immediate plan. However, all highway and interchange improvements between I-170 and I-270 along I-64 will account for possible future rail transit in right-of-way. | Detailed investigation was postponed due to need to analyze rail along the I-64 corridor as far out as St. Charles County. Rail will be evaluated in near term future MTIA by EWGCC and MoDOT. |

Footnotes Regarding Rail Transit

1. Jim Farrell stated that transit was not the end all to transportation problems and we, as a region, need to focus on more efficient and effective movement of people and goods in the south subcorridor.

2. Lars Etzkorn pointed out that while the City of St. Louis was supporting a full-build for MetroLink to Butler Hill Road, it should be noted said recommendation is "divorced" from an alignment decision in the east subcorridor.

## 8.3 EAST-WEST GATEWAY BOARD ACTION

On March 26, 1997, the Board of Directors of the East-West Gateway Coordinating Council met to consider the Study Management Group's recommendations for the Cross-County Corridor MTIA. The Board voted unanimously to amend the Council's long-range transportation plan to include the Cross-County Corridor's Study Management Group recommendation of a preferred strategy, with project scheduling subject to the region's financial capacity. A copy of the EWGCC staff recommendation to the Board is included in Appendix C of this document. The Board specifically voted to amend the long-range plan to include the following preferred strategies, which are shown graphically on Figure 8-1 at the end of this section.

- Transportation Systems Management
- Arterial street and signalization improvements
- Incident management and signalization improvements
- Freeway ramp metering
- Bus service improvements
- MetroLink Expansion
- Stage 1: Existing MetroLink to Clayton and south to Butler Hill Rd.
- Stage 2: Clayton north to I-270/Florissant
- I-170 (North) Interchange Improvements
- Interchanges: Forest Park Parkway, Ladue, Delmar, Olive, Page, I-270
- Lane additions: Scudder to I-270
- Pavement reconstruction: I-64 to north of Page
- I-64 (East) Interchange Improvements
- Interchanges: Brentwood/I-170/Hanley, Big Bend, McCausland/Clayton/Oakland, Hampton, Kingshighway, Tower Grove (eliminate interchanges at Laclede Station Road and Bellevue)
- Auxiliary lanes
- Pavement reconstruction
- I-64 (West) Interchange Improvements and Lane Additions
- Interchanges: McKnight, Clayton, Lindbergh, Spoede
- Lane additions: I-170 to Spoede
- Pavement reconstruction

The array of discrete transportation strategies recommended by the Study Management Group for implementation in the Cross-County Corridor will provide significant progress toward the local and regional goals in each of these areas. In both the I-64 and I-170 corridors, the recommended reconstruction of the existing highways will allow this infrastructure to serve as major transportation arteries well into the 21st century. This reconstruction will also eliminate a number of physical traffic safety problem areas, thereby improving overall highway safety. Improvements to the interchanges and Transportation System Management improvements will have a significant effect on reduction of peak period congestion on these facilities, and the recommended extension of the MetroLink system will further reduce highway congestion in the crowded central corridor. The MetroLink extensions to Clayton and north and south St. Louis County will

provide greatly increased access to jobs and services for all those who must rely on the public transit system for their transportation.

By focusing all of these transportation improvements in the older, developed core of St. Louis, the recommended strategies will serve to encourage sustainable development by inducing more redevelopment in the area and reducing the impetus for greater and greater sprawl outward to the region's rural fringes. To the extent that these strategies reduce congestion on the region's highways, this will aid the efficient movement of goods within and through the region. Finally, the recommended strategies will result in reduced emissions of air pollutants and more efficient travel within the corridor.
In aggregate, the recommended improvements will increase the viability of the central corridor and the inner-ring suburbs, encourage reinvestment in these established areas, and - by directly linking downtown St. Louis and Clayton - reinforce the role of these two areas as the principal centers of commerce in the region. By maintaining the vigor of these areas, and supporting existing development and encouraging further redevelopment, the recommended strategies will directly contribute to maintaining and improving the livability of the communities in the Cross-County Corridor.

It should be noted that the SMG deferred to the Board the decision on a specific alignment for MetroLink in the east subcorridor (existing MetroLink to Clayton). The Transit Steering Committee of the Board had earlier recommended to the full Board that a more detailed assessment of the several options be conducted before a MetroLink alignment decision is made in the east subcorridor. Staff anticipates that the assessment will be complete by September, 1997, and based on that the Board deferred a MetroLink alignment decision in the east subcorridor.