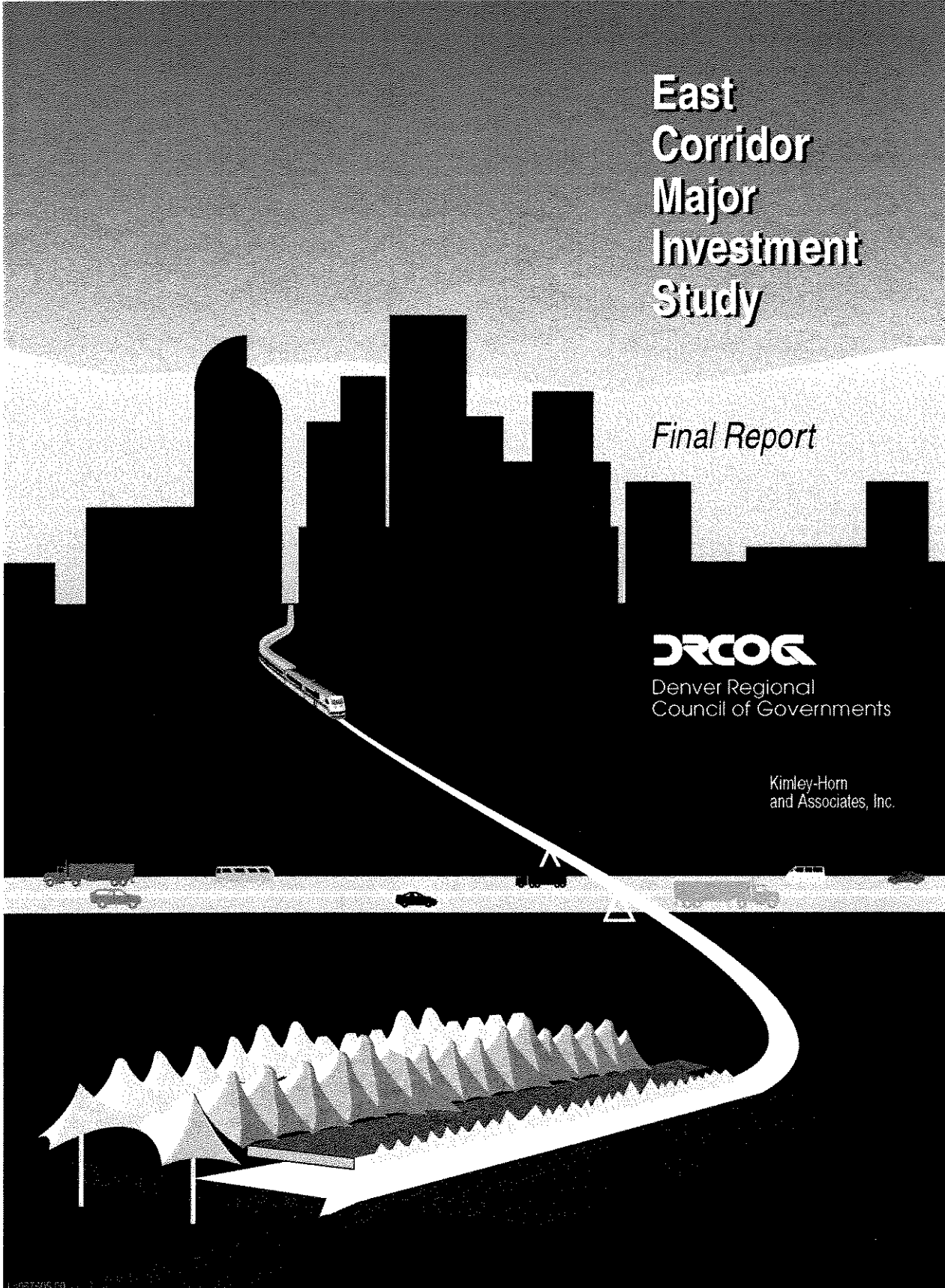


# East Corridor Major Investment Study

*Final Report*

**DRCOG**  
Denver Regional  
Council of Governments

Kimley-Horn  
and Associates, Inc.



**EAST CORRIDOR MAJOR INVESTMENT STUDY  
FINAL REPORT**

July 1997

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## **EXECUTIVE SUMMARY**

### ***Introduction***

The 2015 Interim Regional Transportation Plan (RTP) for the Denver metropolitan area, adopted by the Denver Regional Council of Governments (DRCOG) in 1993, designated the East Corridor, defined as the area between downtown Denver and Denver International Airport (DIA), as a Major Transportation Investment Study corridor. The East Corridor Major Investment Study (MIS) fulfills the intent of the 2015 RTP designation. **Specifically, the objective of this MIS is to identify the mix of transportation improvements that can be most effective in improving travel in the corridor within anticipated funding constraints while considering environmental and community impacts.** The East Corridor MIS also addresses the requirements for such studies as defined in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991.

The East Corridor Major Investment Study was one of three MIS projects conducted simultaneously in the Denver region over a two-year period. The transportation investment this study recommends will be advanced as a component of, or an amendment to, the region's fiscally constrained 2020 transportation plan. An initial budget target was established for major transportation investments in each of the three corridors, derived from estimates developed during the 2015 regional transportation plan process. The budget is for major capital expenditures and is considered above funds already programmed

for maintenance, operations, and major rehabilitation or reconstruction of transportation facilities in the corridor. For the East Corridor, this initial budget was \$390 million (in 1995 dollars). Recommendations were permitted to overrun the initial budget target somewhat in recognition of new funding initiatives and updated revenue calculations for year 2020.

### ***Corridor Purpose and Need***

The purpose and need for transportation improvements in the East Corridor were determined through the identification of key transportation and development issues and major travel markets using the Corridor. In addition, Regional Transportation Plan goals and policies relevant to the East Corridor were identified. These issues, travel markets, and regional goals and policies were used to assess the relative benefits of alternative transportation investments.

### ***Evaluation Process***

A multi-step evaluation process examined numerous transportation modes and alignment options in the Corridor. The process moved from a broad assessment of preliminary concepts to the detailed analysis of very specific alternatives. The specific steps included:

- ▶ pre-screening of a long list of mode and alignment options;
- ▶ screening of conceptual level alternatives;
- ▶ detailed evaluation of alternatives; and

- ▶ detailed evaluation of investment "packages" (based on combined elements from different alternatives).

The evaluation criteria and methodologies used in the East Corridor MIS were consistent with those used in the other two Major Investment Studies in the region.

### ***Recommendations***

The transportation investment recommended for the East Corridor includes commuter rail and light rail elements, a highway widening component, and transportation management elements. The major components of the recommended corridor investment are shown in **Figure ES-1**.

#### *Commuter Rail and Light Rail Components*

The rail concept proposed for the East Corridor includes the following elements:

- A single-track commuter rail line with passing track sections would be constructed between the Denver Union Terminal (DUT) in lower downtown Denver and DIA, generally following the Union Pacific Railroad alignment to east of Chambers Rd., where it turns north through the I-70/Peña Blvd. interchange, and then runs along the east side of Peña Blvd. into the south end of the DIA terminal. Total distance: approximately 23 miles.
- The Central Corridor light rail transit (LRT) line would be extended one mile north to intersect the commuter rail line.

- Intervening stations would be established at the LRT/commuter rail interface (40th St./40th Ave.), at Stapleton, and in the Gateway area. An additional light rail station would be constructed at 33rd and Downing.
- New and existing Regional Transportation District (RTD) bus service would be oriented to feed commuter rail as appropriate.
- Vehicle technology recommended for use on the commuter rail line is a self-propelled diesel car operating singly or in short trains (called diesel multiple-units or DMUs). The specific DMU technology envisioned is large vehicles with performance characteristics superior to conventional diesel push/pull technology.

#### *Freeway Components*

Highway capacity is increased on the most highly congested segment of the East Corridor, between I-270 and I-225, in the recommended investment package. I-70 would be reconstructed and widened to five through lanes in each direction in this "inner beltway" segment. I-70 also would be widened in each direction between I-225 and Peña Blvd. to transition this additional laneage.

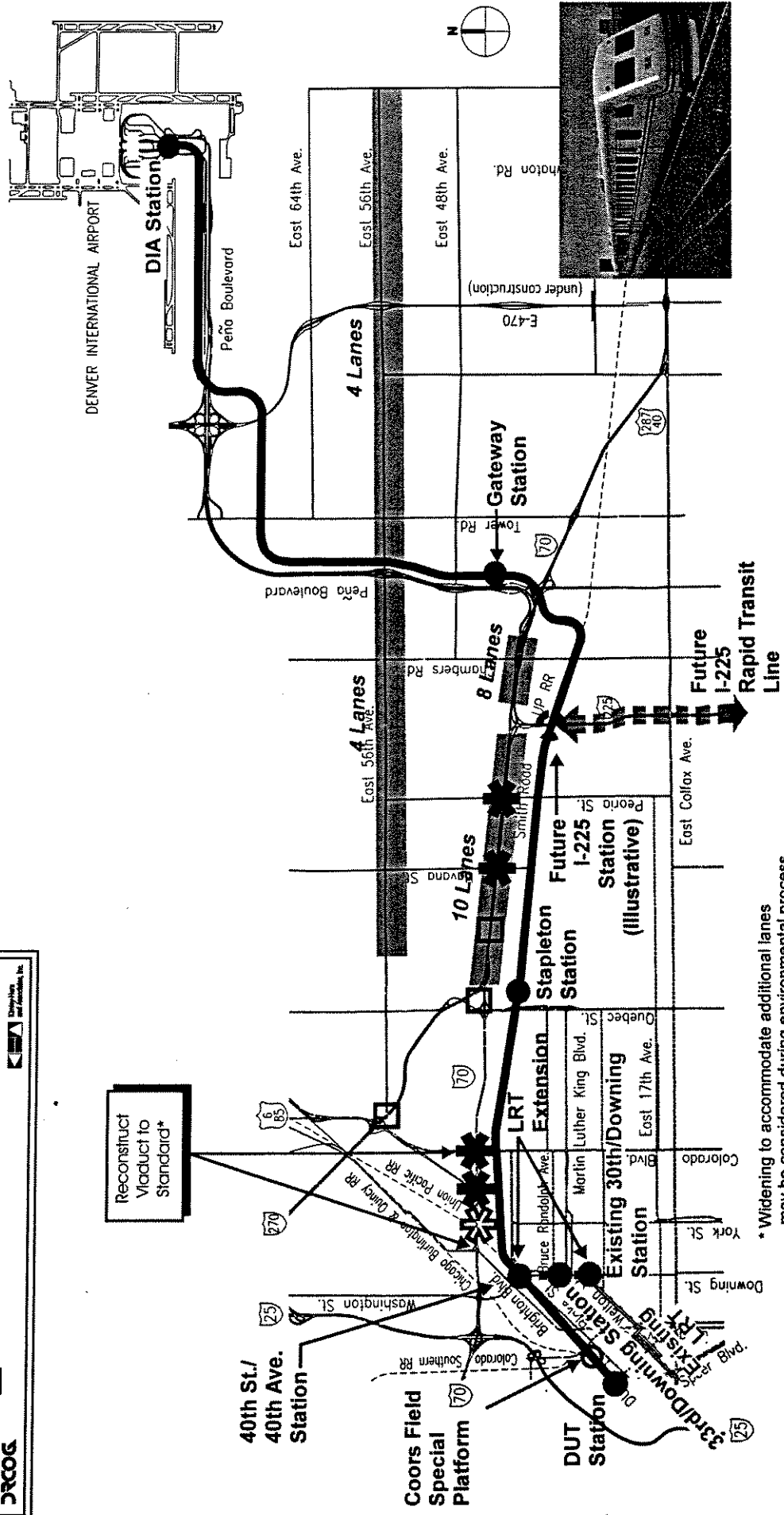
The I-70 viaduct between Brighton Blvd. and Colorado Blvd. would be reconstructed. The East Corridor MIS Policy Level Advisory Committee recommended that viaduct reconstruction only include widening to bring the inside and outside

Figure ES-1

**EAST CORRIDOR MAJOR INVESTMENT STUDY**  
**RECOMMENDED IMPROVEMENTS**  
 (Major Components)

- Commuter Rail Line and Station
- Road Widening
- Interchange Improvement
- Interchange Deletion
- Bridge Reconstruction

**DRCOG** Design/Plan and Illustration, Inc.



\* Widening to accommodate additional lanes may be considered during environmental process

shoulders to standard, but it was noted that, during the Environmental Impact Statement (EIS) process, widening to accommodate additional lanes may be considered. The EIS process would incorporate meaningful, proactive public participation. The cost of viaduct reconstruction was not counted against the corridor budget.

The highway improvements recommended are in addition to East Corridor improvements that are already approved (and thus not included in the Corridor budget), including reconstructing and widening of the freeway between Washington and Brighton, reconstructing the I-70/I-225 interchange, and replacing the Broadway viaduct with a four-lane underpass.

#### *Transportation Management Components*

The Transportation Management elements of this package are a collection of smaller, mutually supportive projects intended to improve operations and modify or reduce the demand for travel in the East Corridor. The Transportation Management elements are divided into two major types of improvements: *supply-related* or Transportation System Management (TSM) projects, and *demand-related* or Transportation Demand Management (TDM) strategies. TSM components in the East Corridor include arterial improvements such as the widening of 56th Ave. from Quebec to DIA, new bus service in eastern Aurora and Denver, Intelligent Transportation Systems infrastructure, and bicycle/pedestrian facility improvements. TDM recommendations include various

actions designed to increase use of the rail investment and reduce congestion.

#### *Costs*

The recommended corridor investment is estimated to have a total capital cost of approximately \$441 million, comprised of:

- ▶ \$316 million for the commuter rail line;
- ▶ \$14 million for the light rail extension on Downing;
- ▶ \$38 million for widening of I-70; and
- ▶ \$73 million for transportation management improvements.

The corridor investment's annual operating and maintenance costs are estimated at \$31.7 million.

The recommended single-track commuter rail with the light rail extension would be about \$100 million less expensive than double-track commuter rail with a light rail extension and about \$190 million less than double-track light rail along the same alignment.

The City and County of Denver has been pursuing commuter rail to DIA as a public-private partnership for several years. Denver staff members have indicated that commuter rail can be delivered at an "on-budget" capital cost not to exceed \$220 million through cost-savings due to private-sector design-build efforts, or with other revenues controlled by Denver. It is recommended that the implementing agency work with Denver to realize this proposal.

### *Benefits*

The investment would provide a number of transportation benefits to the East Corridor in year 2020, including:

- reducing regional vehicle miles of travel by 41,000 miles per weekday;
- reducing regional weekday person hours of delay by almost 9%;
- increasing weekday transit ridership in the Corridor by nearly 9,000 persons.

Of the estimated 108,800 weekday users of the major elements in the recommended corridor investment, about 95,900 would be highway users and the remaining 12,900 would be rail users.

The largest increase in person-carrying capacity would be between I-270 and I-225, where commuter rail and four additional general traffic lanes would accommodate a total of 6,365 more persons per hour in each direction. Projected weekday use of the additional capacity provided in that segment by peak-hour, peak-direction travelers would exceed 90 percent.

Weekday morning and afternoon peak-hour travel times between the Denver central business district (CBD) and DIA would improve for all modes. The greatest improvement would be for transit riders traveling between the CBD and DIA during the afternoon peak hour, who would save about 17 minutes of travel time with the recommended corridor investment. This time savings, coupled with the increased reliability of commuter rail (which is not

influenced by highway congestion), would provide a substantial benefit for one key travel market in the East Corridor.

The segment of I-70 between Brighton Blvd. and Colorado Blvd. would experience severe congestion during peak periods under the proposed six through-lane cross-section.

### *Impacts*

The evaluation process also assessed potential impacts to communities and natural resources of transportation improvements in the Corridor.

#### *Community Impacts*

The recommended corridor investment is estimated to require acquisitions of a minimum of two residences and two businesses; mitigation of neighborhood concerns could result in additional residential displacements. While more than 300 homes would remain within 300 feet of an improved transportation facility in the Corridor, most of these are already within 300 feet of an existing transportation facility. All of the acquisitions and homes remaining within 300 feet of an improved transportation facility are within predominantly low-income or minority neighborhoods, since such neighborhoods ring downtown Denver to the east and northeast.

#### *Natural Resources Impacts*

There are no significant anticipated impacts to natural resources as a result of the recommended corridor investment.



# 1 MIS BACKGROUND

## 1.1 Study Purpose/Relationship to Regional Transportation Plan and Regional Planning Process

The 2015 Interim Regional Transportation Plan (RTP) for the Denver metropolitan area, adopted by the Denver Regional Council of Governments (DRCOG) in 1993, designated the East Corridor, defined as the area between downtown Denver and Denver International Airport (DIA), as a Major Transportation Investment Study corridor. The East Corridor Major Investment Study (MIS) fulfills the intent of the 2015 RTP designation. Specifically, the objective of this MIS is to identify the mix of transportation improvements that can be most effective in improving travel in the corridor within anticipated funding constraints while considering environmental and community impacts. The East Corridor MIS also addresses the requirements for such studies as defined in the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991.

The primary purpose of a Major Investment Study is to provide a rigorous decision-making process for determining transportation investments. As such, this East Corridor MIS includes information that is sufficient to measure and evaluate a range of investment options. It included careful consideration of a full range of mobility alternatives, quantitative and qualitative measures to assess and evaluate alternatives against a baseline, and an open process including community input for determining the preferred investment. Transportation alternatives were examined in corridor- and

system-wide contexts and analyzed for their impacts on air quality. Costs were estimated for each alternative and related to a financially constrained corridor budget. The transportation investment this study recommends will be included in the region's fiscally constrained 2020 transportation plan to the extent that funding is available.

## 1.2 ISTEA Requirements/the MIS Process

The ISTEA metropolitan planning rules and regulations governing the conduct of Major Investment Studies outline a number of characteristics that an MIS must include. The East Corridor MIS was conducted with those characteristics in mind:

- It included a cooperative and collaborative process comprised of major participants in the regional planning process, with the aim of coming to a regional consensus on the range of alternatives that were studied and the factors used to evaluate them.
- It included an evaluation of the effectiveness and cost-effectiveness of alternatives in attaining regional transportation goals and policies.
- The MIS considered the capital and operating costs of alternatives studied, along with a variety of other key factors such as mobility benefits; community and environmental effects; safety; and land use and economic development.

- The East Corridor MIS used a proactive public involvement process that provided a variety of opportunities for the public and various interest groups in the Corridor to participate in the deliberative process.
- Finally, the East Corridor MIS has provided documentation of the consideration given to all transportation alternatives developed and their impacts. This report, and the reports and appendices that support it, are the result of that documentation process.

The ISTEA metropolitan planning rules outline two options for linking Major Investment Studies to the National Environmental Policy Act (NEPA) documentation process. The option chosen for the East Corridor MIS requires that the results of this study be documented in a final report that serves as input to the subsequent formal NEPA process and documentation. The MIS has resulted in the identification of a recommended corridor investment, and the process has developed sufficient information to support elimination of modal alternatives and avoid re-examination in the NEPA process. This MIS adhered to the principles of the NEPA process, including the consideration of alternatives and their environmental effects, interagency coordination, a systematic interdisciplinary approach, and public involvement, but does not include NEPA documentation.

### 1.3 Coordinated MIS Approach within the Region

The East Corridor Major Investment Study was one of three MIS projects conducted simultaneously in the Denver region over a two-year period. In 1994, the region's major planning agencies -- the Denver Regional Council of Governments (DRCOG), the Regional Transportation District (RTD), and the Colorado Department of Transportation (CDOT) agreed to initiate three Major Investment Studies in three critical corridors in the Denver region:

- the East Corridor (along I-70 from Downtown to DIA);
- the West Corridor (along U.S. 6/W. Colfax from Downtown to Golden); and
- the Southeast Corridor (along I-25 from Downtown to Lincoln Ave., including I-225 to Parker Rd.).

The three agencies agreed to coordinate these Major Investment Studies and share certain management responsibilities for them. Overall direction was provided by the DRCOG Transportation Committee, comprised of policy board members and executive staff from CDOT, RTD, and DRCOG. Detailed coordination was addressed by the MIS Coordinating Committee, which included project management staff from the three agencies and their consultant teams. The levels of analysis and other key details for the three MIS projects were developed based on this coordination structure between the three sponsoring agencies, and from input by

relevant federal, state and local government agencies.

Briefings on the three Major Investment Studies were given to regional bodies on a regular basis, including:

- DRCOG Board of Directors;
- DRCOG Transportation Committee;
- DRCOG Transportation Policy Committee;
- DRCOG Transportation Advisory Committee;
- DRCOG Regional Review Team;
- DRCOG Regional Planning Advisory Committee;
- RTD Board of Directors; and
- Colorado Transportation Commission.

The three agencies and their consultants developed a "Guidance Manual" that established common criteria, methodologies, and procedures for conducting the technical analysis of the transportation alternatives developed in the three corridors. This common analysis process was aimed at giving regional decisionmakers consistent information as to benefits, costs, and impacts of the various transportation alternatives developed in the three corridors.

A budget was established for major transportation investments in each of the three corridors, derived from estimates developed during the 2015 regional transportation plan process. The budget is for major capital expenditures and is considered above funds already programmed for maintenance, operations, and major rehabilitation or reconstruction of transportation facilities in the corridor. For the East Corridor, this budget was initially

established at \$390 million (in 1995 dollars). In recognition of new funding initiatives and revenue forecasts for 2020, moderate overrun of the budget target was considered permissible.

#### **1.4 Coordination with Denver's Air Train Proposal**

The City and County of Denver has been pursuing a commuter rail concept to Denver International Airport (called the "Air Train") with private sector participation. Air Train project participants were consulted at several key points throughout the East Corridor MIS process and attended technical and policy meetings for the MIS. Specific details regarding commuter rail alignment options, operating plans, and cost estimates were discussed with Air Train interests.



## 2 CORRIDOR STUDY PROCESS

### 2.1 Overview of Tasks/Technical Work Process

The work program for the East Corridor Major Investment Study was patterned after federal regulatory requirements contained in the metropolitan planning rules as adapted to meet the specific characteristics of the Corridor and the region. The key elements of the East Corridor MIS work program included:

- Task 1: Project Management.
- Task 2: Public and Agency Involvement Process
- Task 3: Project Initiation, including:
  - Preparation of a project Guidance Manual to develop consistent evaluation criteria and processes;
  - Preparation of a comprehensive summary of past studies within the corridor;
  - Collection of data on existing and future conditions in the corridor; and
  - Preparation of a "Purpose and Need Report" to provide a definition of the transportation problems and conditions in the corridor.
- Task 4: Conceptual Level Screening, including
  - Definition of conceptual alternatives;
  - Evaluation of conceptual alternatives using several key screening criteria

(consistency with regional goals and policies; capital cost and affordability; mobility levels; environmental impacts; and community impacts); and

- Preparation of a screening evaluation technical report, resulting in a "short list" of alternatives recommended for more detailed evaluation.
- Task 5: Detailed Level Evaluation, including:
  - Definition of detailed alternatives; and
  - Evaluation of detailed alternatives (using detailed evaluation criteria including effectiveness/benefits; costs/affordability; cost-effectiveness; and environmental and community impacts).

Each major step in the MIS process was documented in a technical report. These reports served as important milestones in the process, and allowed different audiences and advisory groups to comment on specific details. The full series of technical reports, available from DRCOG, includes:

- *Technical Report No. 1: Project Management Plan*
- *Technical Report No. 2: Guidance Manual* (developed by all three MIS teams)
- *Technical Report No. 3: Purpose and Need*

- *Technical Report No. 4: Definition of Conceptual Level Alternatives*
- *Technical Report No. 5: Evaluation of Conceptual Level Alternatives*
- *Technical Report No. 6: Description of Detailed Level Alternatives*
- *Technical Report No. 7: Evaluation of Alternatives*
- *Technical Report No. 8: Recommendations*
- *Technical Report No. 9: Recommended Corridor Investment Plans, Profiles, and Cost Sheets*
- *East Corridor MIS Public Involvement Record*

## 2.2 Policy-Level Advisory Committee

A key element of the East Corridor MIS evaluation and decision process was the ongoing involvement of elected and appointed officials from throughout the Corridor. The formal structure for the participation of those individuals was the study's Policy-Level Advisory Committee. These individuals provided ongoing review and comment on all aspects of the study, particularly at key project milestones. This committee was composed of representatives of local, regional, and state government policy bodies (including some quasi-governmental bodies). Bodies represented included:

- the City and County of Denver;
- the City of Aurora;
- the City of Commerce City;
- Adams County;
- the City of Arvada;
- the Colorado Transportation Commission;
- the Regional Transportation District; and
- the E-470 Authority.

## 2.3 Committee of Technical Staff

Another key Corridor committee was composed of federal, state, regional and local government staff who had an interest or stake in the project, in addition to other agency representatives as appropriate. This Committee was asked to review all technical reports developed for the study. This Committee included representatives from:

- the City and County of Denver;
- the City of Aurora;
- the City of Commerce City;
- Adams County;
- the City of Arvada;
- Denver Regional Council of Governments ;
- Colorado Department of Transportation;
- Colorado Department of Health and the Environment;
- Regional Transportation District;
- Regional Air Quality Council;
- Federal Highway Administration;
- Federal Transit Administration;
- Federal Aviation Administration;
- Union Pacific Railway;
- Public Utilities Commission;

- E-470 Authority
- Denver Union Terminal; and
- the Downtown Denver Partnership.

citizens and organizations throughout the corridor.

Complete details of all public involvement activities, meetings, and briefings have been assembled in a *Public Involvement Record*.

## 2.4 Public Involvement Process

The East Corridor Major Investment Study relied on an intensive and comprehensive public involvement process. The public involvement process was designed to meet federal planning regulations in that it was proactive, early and continuing, complete, timely, broad in its outreach, and responsive. Community involvement techniques used throughout the course of the study included:

- a series of general public meetings at key points in the study process;
- specific issue meetings with government officials and community leaders to discuss issues of concern to those individuals;
- meetings with community and neighborhood groups in the Corridor throughout the project, but especially during key decision points (groups were informed that Spanish-speaking members of the MIS project team would be made available at their request);
- an ongoing media relations effort;
- an MIS newsletter for all three corridors, with special inserts highlighting East Corridor activities; and
- the development and maintenance of a comprehensive mailing list of interested



### 3 CORRIDOR PURPOSE AND NEED SUMMARY

#### 3.1 Corridor Description/Overview

On February 28, 1995, the new Denver International Airport (DIA) began operations, replacing Stapleton International Airport as the Denver metropolitan area's major air terminal. Before DIA opened, traffic on Interstate 70 was at or near capacity on many of its segments. For example, in 1988, the segment of I-70 between I-270 and I-225 carried an average of 116,800 vehicles per day; by 1993, it was used by 138,600 vehicles per day. Two weeks after the opening of DIA, traffic on this same segment of I-70 had increased to more than 170,000 vehicles per day, an increase of 24%.

The opening of DIA, with its associated traffic patterns, focused attention on the need to improve mobility throughout the I-70 corridor from downtown Denver to DIA. The area shown in **Figure 3-1** and loosely defined by East Colfax Ave. to the south, 56th Ave./Peña Blvd. to the north, I-25 and the Denver Central Business District to the west, and DIA to the east is the East Corridor Study area. The East Corridor stretches about 25 miles and includes portions of three cities (Denver, Aurora, and Commerce City) and two counties (Denver and Adams).

I-70 fulfills a number of important transportation functions for the region:

- it serves both interstate and intrastate travel;
- as the only east-west freeway on the east side of metro Denver, it provides important regional access to downtown Denver from the eastern part of the metropolitan area;
- it is the most crucial link for people and goods between central Denver and DIA;
- it is a critical link of an "inner beltway" that includes I-270 and I-225;
- it provides vital access to adjacent employment areas and intermodal freight facilities; and
- it serves key development and redevelopment areas, including the Stapleton Airport site and the Gateway development.

Travel demand through the East Corridor, including demand associated with DIA, has resulted in congestion, especially during peak periods (which are growing longer every year). This increased traffic growth, coupled with the age of I-70 (more than 30 years), suggests that planning for a comprehensive set of long-range transportation improvements in the Corridor would be appropriate.

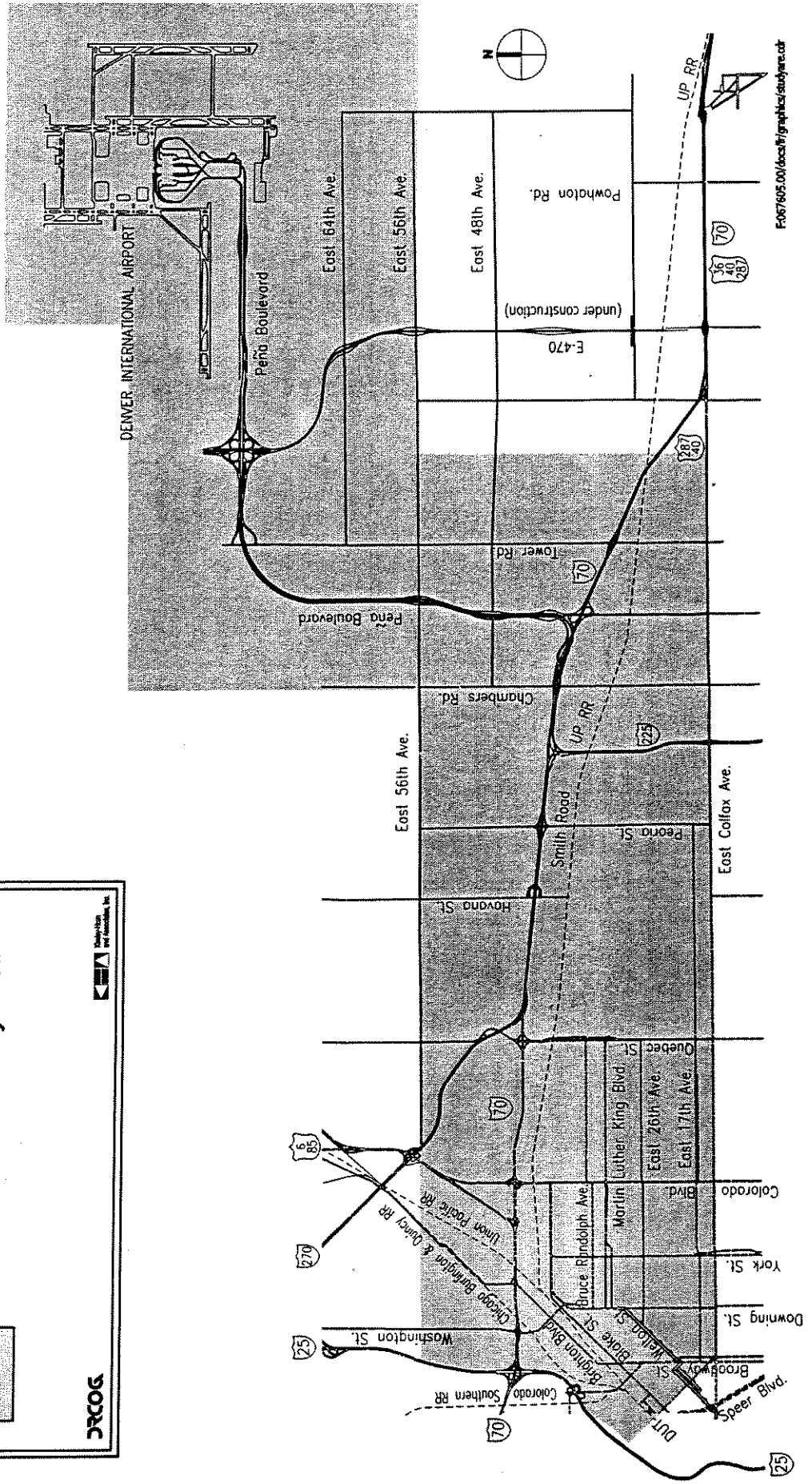
#### 3.2 Land Use and Development Issues

Several existing and projected East Corridor land use and demographic dynamics were considered as transportation alternatives were developed, including:

Figure 3-1

**EAST CORRIDOR MAJOR INVESTMENT STUDY**

**The East Corridor Study Area**



- **Residential population in the East Corridor is projected to increase by 23% between 1995 and 2015.** In addition, there are generally higher residential densities projected for the Corridor in the future, primarily the result of the multi-family residential areas proposed for the Gateway and Stapleton developments. Higher densities generally require more concentrated transportation improvements, including transit.
- **Employment in the East Corridor is projected to increase by 40% over the next twenty years, with employment expected to increase faster in the non-CBD areas of the Corridor.** Overall employment growth will be focused on the Denver CBD, the Stapleton Redevelopment area, along Peña Blvd. at the Airport Gateway, and at DIA. These concentrations of employment growth could impact the shape and course of future transportation improvements, especially directly along I-70. In addition, future employment in the Corridor is forecast to be almost twice the Corridor's projected population, indicating that the Corridor is a major regional destination for employment purposes.
- **Several East Corridor neighborhoods have high minority populations and are subject to special considerations whenever major transportation improvement decisions are being contemplated.** Environmental justice addresses the potential for minority or low-income neighborhoods to be disproportionately impacted by transportation improvements. Areas with high concentrations of minority population include the Swansea, Globeville, Elyria, Cole, Whittier, Clayton, Skyland, North Park Hill, Northeast Park Hill, and Montbello neighborhoods of Denver.
- **Several areas in the East Corridor have relatively high proportions of traditionally transit-dependent residents.** The low-income population in the Corridor is concentrated in the northeast Denver area (including south Montbello) and northwest Aurora. Downtown Denver and the Five Points/North Capitol Hill, City Park West, and Park Hill areas have high concentrations of elderly residents. Areas with households averaging less than one car per household include downtown Denver and the Five Points, North Capitol Hill, and City Park West neighborhoods. These findings suggest one element of the study would be to assure convenient and affordable public transit service in those neighborhoods, linking those residents particularly to newly developing job opportunities.
- **New development in the Corridor will need improved access.** Residential and commercial growth projected for the Corridor (primarily associated with the new developments proposed for the Stapleton and Gateway areas), growth in air cargo activity in and around Denver International Airport (DIA), and future parks and open space plans (including the conversion of the Rocky Mountain Arsenal into a wildlife refuge) will all

cause the need for improved access in the East Corridor.

- **Outside of I-70, the only significant continuous through roadways in the Corridor are East Colfax Ave. and 56th Avenue (which was built through the Stapleton site after the East Corridor MIS was started).** Major physical barriers -- including Stapleton, Lowry Air Force Base, Fitzsimons Medical Center, and the Rocky Mountain Arsenal -- have prevented the construction of more through roads in the Corridor. Redevelopment of those areas will provide some improved access, but their specific development plans prepared to date call for either no through access (such as at the Rocky Mountain Arsenal) or limited through access in those areas.
- **Several existing sites in the East Corridor pose potential barriers to transportation improvements.** Major barriers include interstate highways, residential areas, railroads, the Rocky Mountain Arsenal/Wildlife Refuge site, and the former Stapleton Airport. Crossing or penetrating any of these barriers with major transportation projects could result in higher costs and community or environmental impacts that must be taken into account as new transportation corridors are planned.

### 3.3 Transportation Issues

Several major transportation related issues exist in the East Corridor that must be

considered when developing transportation alternatives:

- **The East Corridor is being called upon to accommodate the ever-increasing levels of passenger and goods movement with a deteriorating infrastructure.** I-70, the primary highway facility in the Corridor, was constructed in the early 1960s. Its bridges and viaducts originally were designed to serve a useful life of 30 years. Now past that designed life span, the facility is experiencing deterioration and faces the need for major rehabilitation or reconstruction within the time horizon of this study. Several portions of the freeway's elevated structures are classified as structurally deficient or functionally obsolete and are scheduled for replacement or rehabilitation. However, the portion of the viaduct segment between Brighton Blvd. and Colorado Blvd. is rated as "structurally deficient," but neither its replacement nor rehabilitation is funded as of yet.
- **Travel volumes on I-70 are far in excess of those anticipated when the facility was designed and built.** When I-70 opened in 1964, the Denver metropolitan area had a population of approximately one million. By 1995, that population had grown to two million. That regional population increase resulted in substantially higher travel volumes on I-70 than was expected when it was first constructed. Moreover, the construction of new "linking" freeways in the area (including I-270 and I-225) has funneled additional

traffic onto critical segments of I-70. Traffic on the most heavily used section of I-70 (from I-270 to I-225) increased from 138,800 vehicles on an average weekday in 1993 to more than 170,000 on one day in May 1995 (just after the opening of Denver International Airport) -- an increase of more than 20% in just two years.

- **I-70 operates at Level of Service "F" during peak hours in both directions.** Peak periods on the freeway have increased to 2-3 hours in the mornings and up to four hours in the afternoons. Moreover, traffic is almost equally split between eastbound and westbound vehicles at all hours of the day. During peak periods, traffic volumes on I-70 between I-270 and I-225 are in the Level of Service (LOS) E range, where even minor disruptions can cause significant delays. In addition, the segment between I-25 and I-270 operates close to capacity in the LOS E to F range during peak periods. The substandard side clearances and interchange geometry of this segment (much of which is elevated) contributes to those problems. Even with existing and committed roadway improvements, most major arteries in the Corridor (and not just freeways) will experience significant amounts of congestion by the year 2015.
- **I-70 through the East Corridor experiences accidents at a rate 40% higher than the state average for urban freeways.** The segments between I-25 and Brighton and between I-225 and Chambers have accident rates almost twice the state average, though some of

those rates can be attributed to highway construction. The segment between Brighton and Colorado experiences an accident rate 60% above the statewide average, mainly due to substandard geometry and ramps.

- **Truck traffic comprises a significant portion of all traffic in the Corridor.** The northwest corner of the Corridor contains the highest concentration of truck terminals in the state. In addition, truck traffic comprises up to 14% of total daily traffic on I-70 throughout the Corridor, increasing to almost 20% of all traffic east of Peoria.
- **An average of 5,300 commercial vehicles enter and exit DIA each day.** While that total is a relatively insignificant percentage of total East Corridor traffic, it comprises roughly 10% of all traffic on Peña Blvd. between DIA and I-70.
- **There is a sparsity of transit service and park-and-ride lots in the eastern reaches of the Corridor.** The Regional Transportation District (RTD) provides good local bus service in the densely populated southern and southwestern parts of the Corridor, but relatively little service in less populated areas. Outside of skyRide service to DIA, only one traditional express route operates in the Corridor on I-70, and it experiences an average weekday ridership lower than most routes in the Corridor. The most-used transit route in the Corridor is the local and limited service provided along East Colfax Ave. Only three park-and-

ride lots are located in the East Corridor east of the 30th/Downing LRT station.

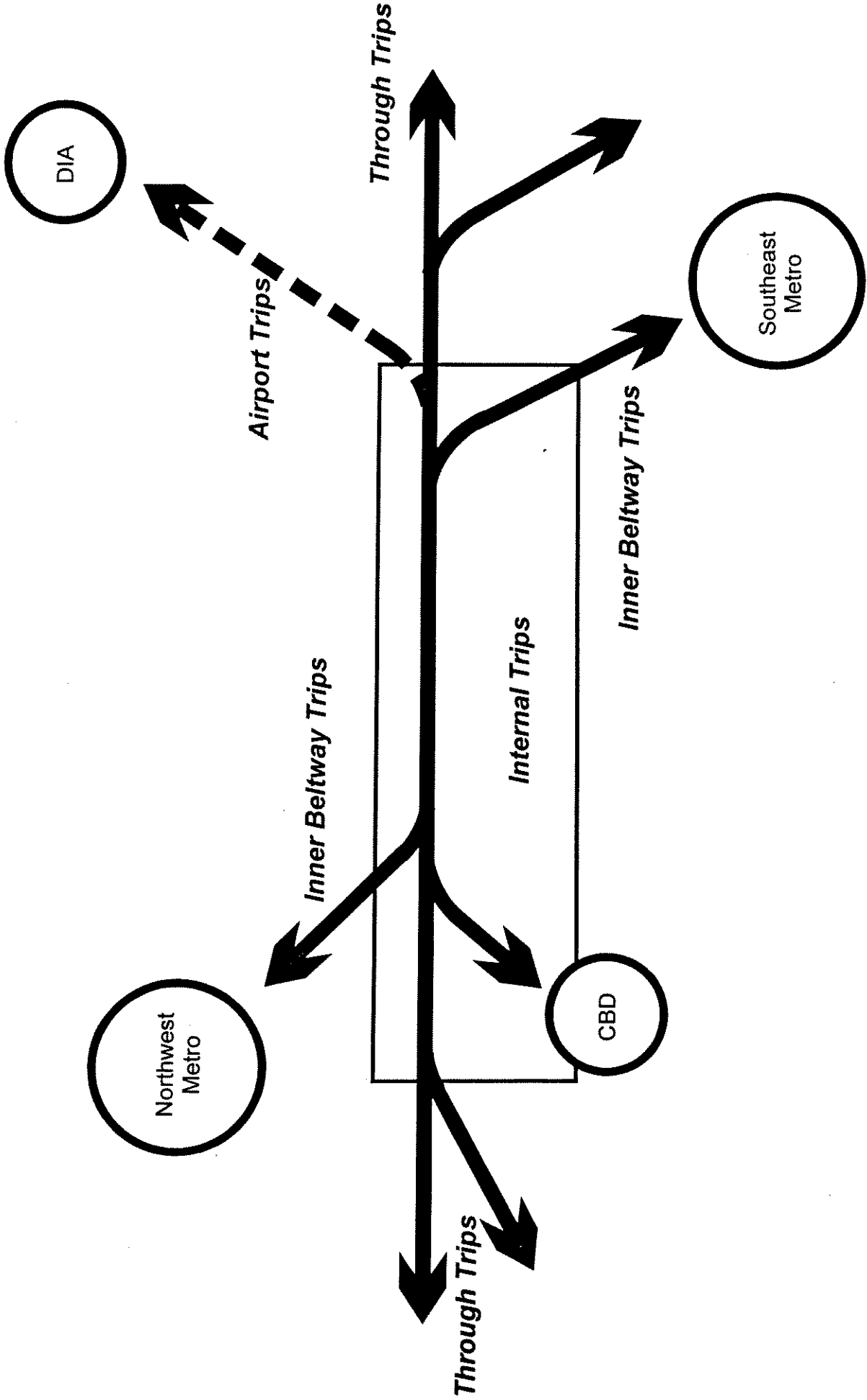
■ **The UP railroad corridor stretches the length of the study area and presents an opportunity for enhancement as a multi-modal transportation facility.**

Approximately 83 trains operate every day through the East Corridor, but most of those operations occur generally north-south on the western edge of the Corridor. The Union Pacific operates eight trains per day through the heart of the East Corridor, from Denver Union Terminal paralleling I-70 along Smith Rd. to the eastern edge of the Corridor, and this could double or more when the operations of the merged Union Pacific/Southern Pacific are revised. UP has a major intermodal yard northeast of downtown between Downing and York. At least 17 grade crossings exist on the UP railroad between the CBD and Airport Blvd. The amount of freight train traffic in this corridor now and in the future could act as a barrier to transportation improvements.

In summary, the following issues from those identified above were considered most important for recommending the Corridor Investment:

- ▶ Substantial heavy truck traffic;
  - ▶ An aging and deteriorating infrastructure;
  - ▶ Relatively high proportions of transit-dependent residents in certain areas of the Corridor; and
  - ▶ Large quantities of vacant land with the potential for substantial residential and business growth.
- 3.4 Major Travel Markets
- Interstate 70 was designed to be a part of the National Defense Highway System with the express purpose of facilitating interstate travel. I-70 is the major east-west highway through Colorado. As such, the accommodation of regional trips was a secondary purpose of the facility. The accommodation of local trips was not a significant original purpose of the interstate system.
- A travel demand analysis conducted for the East Corridor MIS at the former location of the airport tunnels on I-70 showed several significant current and future travel markets, (as shown in **Figure 3-2**) including:
- ▶ The lack of significant continuous east-west roadways (and other transportation facilities) in the Corridor;
  - ▶ Current traffic congestion during peak periods on several segments of I-70;
  - ▶ An accident rate on I-70 higher than the state average for freeways;
  - ▶ "Inner beltway" trips between the southeastern and northwestern portions of the metropolitan area, primarily using I-70 as a link between I-225 and I-270;
  - ▶ "Airport" trips, including to and from downtown Denver and the mountain areas west of Denver;

**Figure 3-2**  
**Major Travel Markets in the East Corridor**



- ▶ **"Through"** trips from east or southeast of the Corridor to areas west of the Corridor; and
- ▶ **"Internal"** trips that use I-70 to travel between East Corridor neighborhoods and employment centers (such as downtown).

The travel demand analysis shows that only 11% of all traffic through the I-70 segment between I-270 and I-225 is currently generated by Denver International Airport; that percentage is forecast to grow to 16% by 2015.

### 3.5 Relevant Regional Policies and Goals

The transportation improvement projects recommended in this East Corridor MIS were developed within a regional context, based on goals and policies to ensure coordination with the regional transportation planning process. These goals and policies are derived from the 2015 *Interim Regional Transportation Plan* (RTP, adopted by DRCOG in October 1993) and are designed to encourage the

"... development of a multimodal and intermodal transportation system with strong ties to the development planning process. They recognize that regional solutions must be found to regional transportation and air quality problems; and that the region's development growth, transportation and air quality problems must be jointly addressed."

The RTP's goals and policies reflect a need to:

- Reduce congestion and provide access through multimodal solutions;
- Support economic development through the provision of high-priority facilities; and
- Preserve and enhance the natural and built environment.

Because the RTP's goals and policies address the broad array of activities required of a *regional* long-range transportation planning process, not every one is specifically applicable to a corridor-focused MIS. The regional multimodal goals and policies from the 2015 RTP considered most applicable in this study are:

#### **RTP Goal: "Provide Accessibility and Mobility for People and Goods"**

##### *Related RTP Policies Appropriate to East Corridor MIS:*

- ▶ "Increase the regional system's capability to efficiently move people and goods."
- ▶ "Implement rapid transit to reduce vehicle miles traveled and the need for additional roadway capacity."
- ▶ "Design the rapid transit system to have a significant time savings over highway travel during the peak period."

**RTP Goal: “Enhance the Quality of Life and Minimize Adverse Impact on the Natural Environment. Integrate Planning for Regional Development, Transportation, and Air Quality.”**

*Related RTP Policies Appropriate to East Corridor MIS:*

- ▶ “Reduce mobile source emissions and conform to state implementation plans for attaining and maintaining the national ambient air quality standards. Incorporate transportation control measures adopted in state implementation plans.”
- ▶ “Emphasize the use of alternative modes rather than adding significant roadway capacity within the areas at immediate risk of exceeding the national ambient air quality standards.”
- ▶ “Provide multimodal options and multiple access points to major destinations such as regional shopping centers, business districts, and airports.”
- ▶ “Minimize energy consumption and reduce reliance on petroleum energy sources.”

**RTP Goal: “Implement the Adopted Regional Transportation Plan (RTP)”**

*Related RTP Policies Appropriate to East Corridor MIS:*

- ▶ “Make major transportation corridor operations more efficient by implementing Intelligent Transportation System strategies.”

- ▶ “Design safe and efficient transportation facilities.”

**3.6 Conclusions: Purpose and Need for Major Transportation Investments in the East Corridor**

In the years ahead, as population and employment growth continue in the East Corridor and major new developments (including those at Stapleton and Gateway) are implemented, conditions on I-70 will worsen: increasing congestion for longer periods of the day; slow travel speeds; large amounts of truck traffic; spillover traffic to local arterials; an increased number of accidents and incident-related congestion; and environmental consequences (especially degradation of air quality). All the while, the existing freeway infrastructure will continue to age and deteriorate.

Clearly, there is a need to develop and evaluate a wide range of alternatives for passenger and goods movement to address the East Corridor's growing transportation problems. The need for transportation improvements in the East Corridor is specified in the adopted RTP, which calls for implementation of projects that increase needed person-carrying capacity. This MIS is necessary to identify appropriate modal investments, and to ensure that federal funds can potentially be used for funding these projects.

