2.0 METHODOLOGY

This chapter summarizes the project study area limits and the goals and objectives of the project. The study approach, including the screening process is also summarized in this chapter.

2.1 C-470 STUDY AREA

The study area is bounded by I-70 to the north and I-25 to the east. Naturally, traffic analysis zones (TAZs) used in the travel demand model extended outside of this area, but for the purposes of using a micro-simulation model and determining potential impacts to the area, the limits noted above were used. All surface streets paralleling C-470, including Dry Creek Road/Mineral Avenue/Ken Caryl Avenue, County Line Road, Plaza Drive, Town Center Drive, Highlands Ranch Parkway, Lincoln Avenue, and Dad Clark Drive were included in the study area limits. On the western portion of C-470 where the alignment is orientated more north/south, Kipling Parkway, Bear Creek Boulevard, and Simms Street were included in the evaluation of the parallel surface street facilities. All streets with existing interchanges along C-470, in addition to locations where future interchanges has been proposed, were included in the study area. The locations where future interchanges have been discussed include Alameda Parkway, Yale Avenue, and Colorado Boulevard. A map of the project study area is shown in Figure 2.1.

2.2 STUDY GOALS AND OBJECTIVES

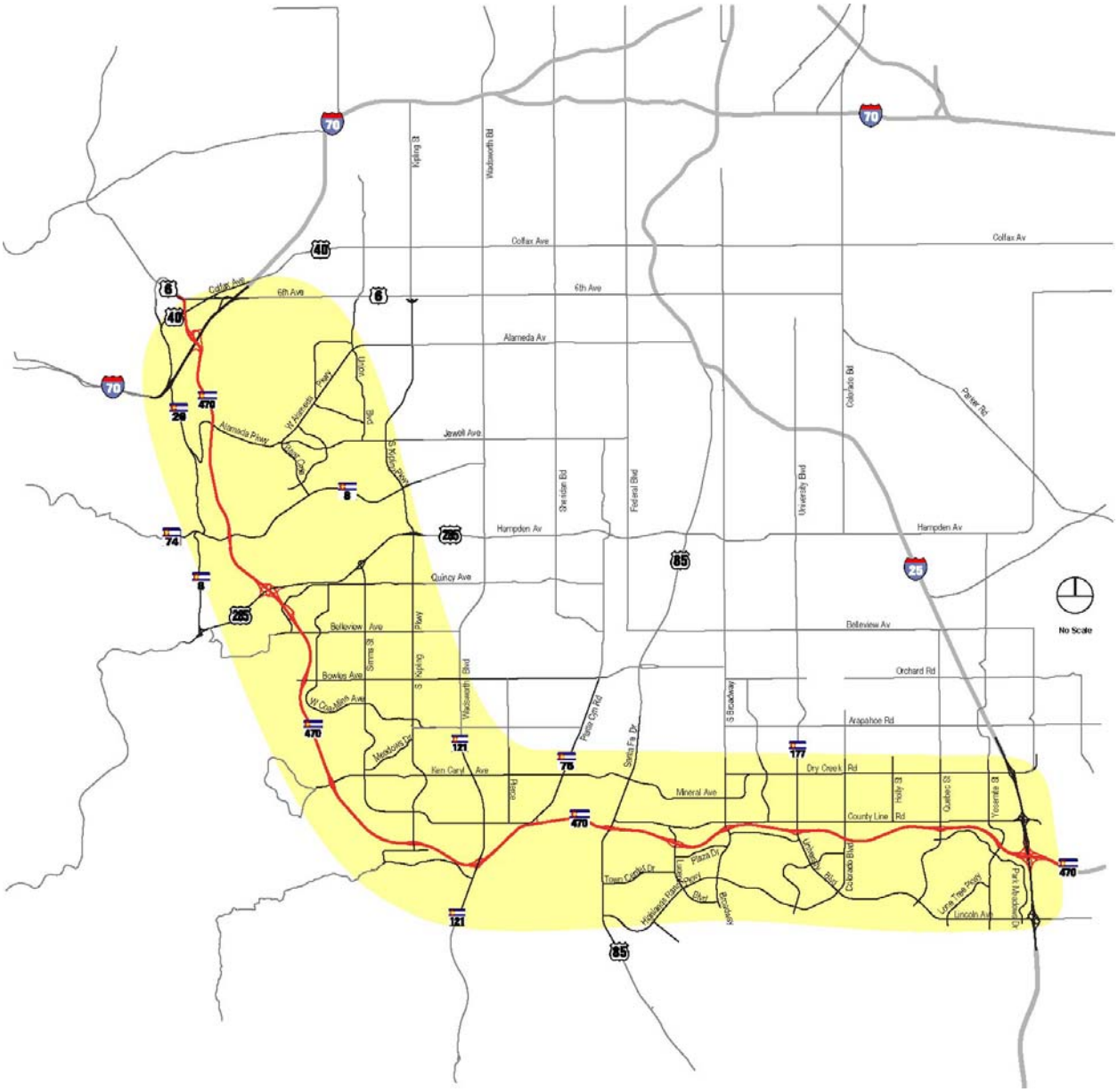
The ELFS had two primary objectives. First, it was intended to confirm the initial findings of the statewide feasibility study which concluded that C-470 had good potential as a candidate toll corridor. Second, it was intended to determine if express lanes could be a viable alternative in the C-470 Corridor EA. It would assess the design, operation, financial feasibility, and public acceptance of implementing potential value pricing options as part of potential solutions to congestion, delay, and reliability along the corridor. The planning horizon used for the study was 2025. Travel demand forecasts were obtained using the regional travel demand model developed by DRCOG, with appropriate land use refinements as discussed with the various local government planning departments. The roadway network used in the travel demand model consisted of the existing network plus committed projects.

2.3 STUDY APPROACH

The ELFS began with traffic data collection along the corridor to assess existing and projected future conditions. A detailed screening process was performed to determine which corridor segments had demand for express lanes, the ultimate access locations, and access types along the corridor. The first level of screening consisted of using the travel demand model to assess existing and projected 2025 volumes to determine which segments were over capacity, and thus had demand for express lanes. The locations that

showed little demand for express lanes were studied at a very cursory level. The segments that showed a higher demand were thoroughly evaluated throughout the remaining screening process.

Figure 2.1
Study Area



The second and third levels of screening evaluated the existing and projected volumes at existing and proposed interchange locations to determine which locations had high enough demand to warrant a potential express lane access. The TP+ model, an

extension of the DRCOG travel demand model, was used to provide a realistic view of an express lane facility and a refined look at access locations. The fourth level of screening used the AIMSUN micro-simulation model to provide a detailed look at operations along the corridor to finalize access locations and types.

Concurrent with the AIMSUN model development, a stated preference survey was administered to corridor users to assess their value of time during their typical commute. This value of time was used in the AIMSUN model to develop the toll rate a driver would be willing to pay for a particular time savings. The output from the AIMSUN model generated the number of express lane users, toll rates, hours in which the toll rate would be applied, and the types of access and laneage required to accommodate the vehicles.

After the screening of access locations and types was completed, the final express lane configuration was refined to optimize traffic volumes, operations, and revenue. A conceptual design on the final alternative was completed to develop project cost estimates and potential environmental impacts. Using the T&R forecasts and the cost estimate, a present value analysis of projected net revenue was completed to assess the project's financial feasibility.

After a financially feasible alternative was established, the alternative was carried forward into the EA to be compared against other alternatives. The study also developed a potential implementation plan for the segments that were not deemed feasible within the 2025 design year.

2.3.1 C-470 Corridor Environmental Assessment

The National Environmental Policy Act (NEPA) requires that the FHWA identify and avoid potential impacts to the social and natural environment when considering approval of proposed transportation projects. The FHWA NEPA project development process is an approach to balanced transportation decision making that considers the potential impacts on the human and natural environment and the public's need for safe, efficient transportation.

NEPA requires that federal agencies disclose the results of their analysis and the effects of project implementation on the environment and solicit comments on the proposals from interested and affected parties. The purpose of documenting the NEPA process is to provide complete disclosure to the public; allow others an opportunity to provide input and comment on proposals, alternatives, and environmental impacts; and provide the appropriate information for the decision maker to make a reasoned choice among alternatives.

CDOT and the FHWA identified the need for improvements along the C-470 Corridor and thus initiated the C-470 Corridor EA to determine potential effects of various

alternative transportation solutions. The purpose of the EA was to address congestion, reduce traveler delay, and improve reliability from Kipling Parkway to I-25. The EA sought to select an implementable transportation alternative that provided reliability, maintained travel times, and provided reliable travel choices to accommodate an expected increase in the intensity and duration of congestion forecasted for the design year of 2025.

2.3.2 Value Engineering (VE) Study

In association with the EA, a VE Study was completed in September 2004 to refine alternatives, identify potential new alternatives, and suggest strategies that would reduce the overall construction cost. Supplemental recommendations were also developed by the VE team to be considered for further study by the project team. The VE team developed 14 proposals and 29 supplemental recommendations for the consideration. The project team reviewed each proposal and accepted three of them for implementation, declined eight, and recommended three for further study. The complete list of suggested proposals and supplemental recommendations is in the *Preliminary Report - VE Study, CDOT Region 6 C-470 EA, Solutions Engineering & Facilitating, Inc., (2004).*