ES.0 EXECUTIVE SUMMARY

ES.1 BACKGROUND

Population and employment growth in the south Denver Metro area have contributed to increased traffic on C-470, the 26-mile beltway around southwest Denver. As traffic volumes increase, congestion, delay, and unreliable travel times have resulted. To evaluate possible solutions to these problems, the Colorado Department of Transportation (CDOT) was awarded a Value Pricing Pilot Program (VPPP) grant from the Federal Highway Administration (FHWA) to study the potential development of managed lanes as a way to alleviate congestion on the corridor.

This C-470 Express Lanes Feasibility Study (ELFS) evaluated the financial and operational feasibility of adding tolled express lanes to C-470 from I-70 to I-25 to the middle of the free general purpose lanes. The C-470 express lanes would charge a variable toll to control the facility volume to maintain reliable, free-flow traffic conditions. The study sought to determine whether traffic demand and willingness to pay tolls might be sufficient to produce a financially viable solution to relieve the congestion. The results of this analysis were then used to formulate recommendations on the appropriate implementation steps.

The ELFS was conducted in parallel with the C-470 Environmental Assessment (EA), which evaluated potential solutions to congestion and reliability problems on the corridor between South Kipling Parkway and I-25. Both studies used 2025 as the planning horizon year. The purpose of the ELFS was to determine whether a tolled express lane alternative was financially and operationally feasible and whether it should be considered as a potential alternative in the EA. As a new concept to the Denver area, tolled express lanes required more evaluation to characterize the alternative and determine its potential viability as an alternative in the EA. The VPPP grant provided the means with which to perform the preliminary financial feasibility of express lanes on C-470.

ES.2 STUDY PROCESS

After development and calibration of regional travel demand and micro-simulation models, a sequential screening process was performed to eliminate unsatisfactory alternatives and to identify those that were viable.

The first step in the ELFS screening process was to perform a cursory capacity assessment of the entire 26-mile C-470 corridor as an initial indication of demand for express lanes. Those sections that did not show a high potential demand were then subjected to a best-case scenario financial feasibility assessment before being dropped from further consideration. Those sections that indicated a higher potential demand were more rigorously screened to determine their feasibility. The second and third

levels of screening evaluated and narrowed down potential access locations. The final step in the process was to identify final access locations and types. After the screening process, the preferred alternative express lane configuration was thoroughly evaluated to optimize T&R and to assess its financial feasibility.

Conceptual design was performed on the preferred alternative, producing horizontal and vertical geometry to be used for the micro-simulation and to develop project cost estimates.

Based on the traffic, revenue, and costs produced, a present value analysis of projected revenue over a 40-year bond retirement period was performed to establish a measure of financial feasibility for the preferred alternative.

The study also investigated potential implementation plans and phasing schemes for the recommended alternative.

ES. 3 SCREENING ANALYSIS

The first level of screening sought to determine which corridor segments would be over capacity in 2025 and therefore would have a demand for express lanes. The segment between Kipling Parkway and I-70 (western segment) showed lower volumes and fewer segments that exceeded capacity; this is because the western segment consists of six lanes from Morrison Road to I-70, and thus can handle the majority of the demand placed on it. The segment between Morrison Road and Bowles Avenue did exhibit demand that exceeded capacity; however, this segment is situated in the center of the corridor and thus presents difficulty in implementing a continuous toll facility. As a result, it was initially determined that the western segment had limited potential for tolling. Upon verifying this initial finding with a cursory revenue analysis, it was determined that the western segment was not feasible in the timeframe of the study's planning horizon, and it was eliminated from further consideration. This conclusion was based on land use and traffic growth assumptions from the adopted 2025 Denver Regional Council of Governments (DRCOG) travel model, and the existing laneage. This approach is a conservative assessment of the financial viability of the western segment; other assumptions, if adequately verified, such as increasing the traffic growth rate or hypothetically changing the existing capacity, could improve the viability of implementing tolls in this segment.

The segment between Kipling Parkway and I-25 (eastern segment) showed the highest volumes and number of segments over capacity, and thus the most potential for express lane usage. This eastern segment was then advanced through the screening process to define and evaluate its feasibility. The second and third levels of screening sought to determine potential access locations for this eastern segment.

Based on interchange locations that showed the highest projected volumes and therefore the highest demand for express lanes, the potential access locations were narrowed to Wadsworth Boulevard, Santa Fe Drive, the University Boulevard/Broadway/Lucent Boulevard area, Colorado Boulevard, Quebec Street, and Yosemite Street/I-25.

The fourth and final level of screening involved a detailed analysis of access locations, operations, and design considerations. At this level, an accurate determination of express lane use was conducted using the MINUTP and AIMSUN travel demand and micro-simulation models. The analysis determined the final access locations to be Wadsworth Boulevard, Broadway/Lucent Boulevard, Colorado Boulevard to and from the east, Quebec Street to and from the west, and Yosemite Street/I-25.

After the screening process, the final express lane configuration was refined to optimize traffic operations and revenue projections. This refinement sought to produce the alternative with the highest financial feasibility and best overall operations. The final alternative, shown in Figure ES.1, proposes a 12.5-mile, four-lane, barrier-separated express lane facility constructed inside the general purpose lane facility from Kipling Parkway to I-25, with the following access points: western terminus at Kipling Parkway, access at Wadsworth Boulevard, Lucent Boulevard/Broadway, Broadway/University Boulevard, Quebec Street, Yosemite Street, and the eastern terminus at I-25.

Figure ES.1
Proposed Access Configuration