

EXECUTIVE SUMMARY

STUDY OVERVIEW

We are pleased to submit this Executive Summary Report of the CTE Preliminary Traffic and Revenue Study for the Colorado Tolling Enterprise (CTE). The various analyses and principal findings contained in the seven chapters of the detailed report are summarized herein. The seven chapters include:

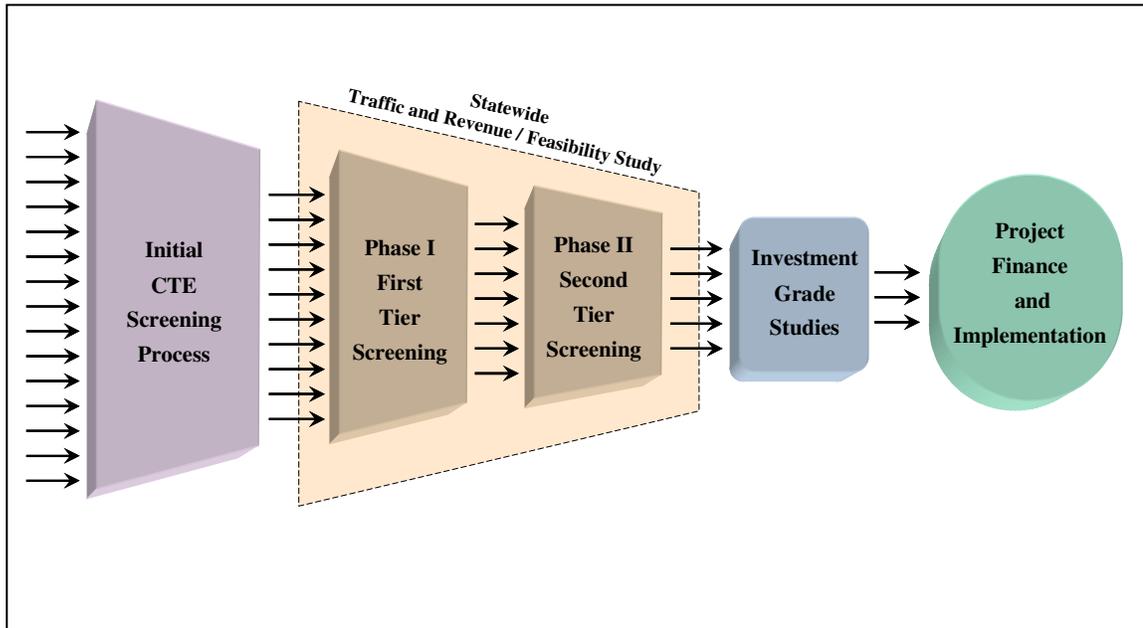
- Chapter 1 – Introduction;
- Chapter 2 – First-Tier Screening Process and Findings;
- Chapter 3 – Preliminary Estimates of Traffic and Toll Revenue, Denver Area Candidate Projects;
- Chapter 4 – Preliminary Estimates of Traffic and Toll Revenue, Candidate Toll Projects;
- Chapter 5 – Preliminary Project Cost Estimates;
- Chapter 6 – Financial Analysis; and
- Chapter 7 – Next Steps Toward Implementation.

Due to an increasing need to identify new potential sources of transportation funding, the Colorado General Assembly authorized the creation of a Statewide Tolling Enterprise in 2002. This resulted in the formation of the Colorado Tolling Enterprise (CTE) which is considering a number of potential candidate toll projects throughout the state. While some relatively new toll facilities already exist, primarily in the Denver area, an expanded use of the toll concept is being considered, primarily as “new capacity” added to the highway system. Following its creation, CTE initiated a process of identifying potential toll projects for possible consideration. Over 90 candidate projects were initially considered and subjected to a very “broad-brush” review process.

Figure ES-1 provides a graphic representation of the tolling evaluation and study process envisioned by CTE. It is a multi-phase process, with each subsequent step adding an increased level of analytical detail. The process eliminates some candidate projects at each phase, culminating in a reduced number of projects being subjected to progressively more detailed analyses. The initial 90-plus candidate projects were subjected to an initial screening process based on “broad-brush” evaluation criteria, including:

- Volume/capacity ratios;
- Average daily traffic volumes in excess of 30,000 vehicles per day (considered at both 2001 and 2030 levels);
- Average daily truck volumes;
- Roadway classifications;
- Projected population growth;
- Inclusion in the state’s 2020/2025 statewide transportation plan;
- Projects identified through the 2003 Strategic Investment Plan process;

- Projects sponsored by private entities; and
- Roadway improvement segments with recently completed or ongoing corridor level studies.



COLORADO TOLL CANDIDATE SCREENING AND STUDY PROCESS
FIGURE ES-1

As a result of this screening process, more than half of the projects on the original candidate list were considered “low priority” and were essentially eliminated from further consideration. Approximately 40 of the projects were considered to have “high” or “medium” potential, meriting further consideration in subsequent analyses.

SCREENING PROCESS AND STUDY PURPOSE

A study team lead by Wilbur Smith Associates (WSA), and including HNTB Corporation (HNTB), Felsburg Holt & Ullevig (FHU), and Citigroup, was selected by CTE to perform the more detailed and refined traffic and revenue analyses envisioned in Phases I and II of the study process. In Phase I of the overall study, a “first-tier” of the screening process was undertaken, starting with all “high” priority and selected “medium” priority projects. This required a new set of screening criteria to be developed by the study team.

This first-tier screening was still a generally subjective analytical approach, albeit somewhat more detailed and rigorous than the initial screening process performed by CDOT. A summary of the first-tier screening process is subsequently discussed.

The surviving projects of the first-tier screening process were subjected to still a more detailed, although still preliminary, second-tier feasibility analyses. Wherever possible, available travel demand models were used to develop preliminary estimates of traffic and revenue potential,

optimum toll levels and revenue growth potential in the second tier analyses. In parallel, the study team also refined project capital, and maintenance and operating cost estimates initially developed during the first tier screening process. Together with the estimates of toll revenue, capital, and maintenance and operating costs, a financial feasibility assessment was performed.

SCOPE OF WORK

This study was intended to provide the CTE with a preliminary feasibility analysis on the list of second-tier candidate toll projects. A number of major work tasks were performed for this analysis as briefly described below.

COORDINATION WITH ON-GOING NEPA STUDIES

There are several corridor studies now underway, largely in and around the Denver area. These include projects which may have toll potential. It was important to coordinate closely with these on-going studies. Representatives of the study team participated in corridor coordination meetings, and provided input on tolling issues as required.

MODEL DEVELOPMENT

Second-tier candidate toll projects were subjected to more detailed, but still preliminary, traffic and revenue analyses. These analyses made use of travel demand models to make traffic assignments at opening and future year levels, and at alternative toll rates.

WSA obtained the latest versions of all available regional travel demand models, including:

- Denver Regional Council of Governments (DRCOG);
- Pikes Peak COG (Ft. Collins area);
- Colorado Springs COG; and
- I-70 West Mountain Corridor model.

TRAFFIC AND REVENUE ANALYSIS

Traffic assignments for all second-tier projects were made at opening (2010) and future (2025 or 2030) years at optimum toll rates. For these, annual estimates of traffic and toll revenue over a 30-year period from 2010 to 2040 were prepared.

CORRIDOR DEVELOPMENT COST ESTIMATES

The second-tier cost estimate methodologies involved updating and refining available information from CDOT to establish typical improvement standards and construction cost build-up tables for the various facility types. These standards were then applied to the various corridors based on the definition of each corridor's improvements. The definition of the necessary improvements to each corridor depended on the current configuration of the existing roadway, if applicable, and the nature and extent of the facility upgrades. The associated construction and on-going maintenance cost estimates were based on the application of the typical standards to the identified improvements to each corridor.

Also included in the capital cost estimate for each project is the cost for electronic toll collection (ETC) equipment and installation. The unit costs for ETC equipment and installation were based on recent bid tabulations from other comparable turnpikes and other toll facilities operating in Colorado, as well as previous team experience on other toll projects.

FINANCIAL FEASIBILITY ANALYSIS

After the traffic and revenue forecasts were developed, the study team brought the various analytical results together into an analysis of the financial feasibility of the second-tier toll candidate projects. Citigroup undertook the analytical responsibility to assess financial feasibility, using their discounted cash flow model.

The analysis determined the capacity of the proposed project to support debt, and also included setting aside sufficient reserves for unplanned major maintenance or construction, for debt service, and for rate/toll stabilization. Each project was analyzed as a stand-alone, single asset facility and then, several select projects were analyzed under an integrated system approach to gauge levels of feasibility.

FIRST-TIER SCREENING

Prior to the commencement of WSA's first-tier screening study, the Colorado Tolling Enterprise (CTE) conducted a preliminary evaluation of potential candidate toll facility projects in Colorado. Through its own broad screening approach, 39 candidate projects were selected out of more than 75 potential projects. These 39 projects, in various configurations, were evaluated by WSA in a first-tier screening, intended to facilitate the selection of projects to be studied in the second-tier phase of evaluation.

The findings of the first-tier evaluation phase resulted from application of 12 first-tier screening criteria developed in "Technical Memorandum No. 1 – Proposed First-Tier Screening Criteria," as well as consideration of public comments. Of necessity, the analytical approach used was largely subjective in nature, making maximum use of available information, such as traffic counts, historical construction costs, information from prior studies, and professional judgments. At this level of study, it was not appropriate to conduct a detailed traffic or engineering analysis of each of the corridors; rather, each project was analyzed using a "broad-brush" approach, with care taken to ensure consistent levels of analysis between projects, to the maximum extent possible.

Twelve "first tier" screening criteria were used, as identified in the aforementioned "Technical Memorandum No.1." These include, in no particular order of importance:

- Potential Safety Impacts;
- Toll Operations Viability Assessment;
- Economic Growth Considerations;
- Consistency with Statewide and Regional Plan Goals;
- Community Impact Assessment;
- Congestion Relief Potential;

- Network Continuity Considerations;
- Order-of-Magnitude Construction Cost Estimates;
- General Constructability Assessment;
- 20th Year Traffic and Revenue Potential;
- Relative Financial Feasibility Index; and
- Other considerations.

Detailed descriptions of these criteria can be found in the previously submitted technical memorandum, “Proposed First-Tier Screening Criteria, Candidate CTE Toll Facility Project.”

CANDIDATE PROJECT LIST OVERVIEW

Table ES-1 presents a list of all 39 projects evaluated in this screening. Indication of the type of each project is also given, using the following categories:

- Managed lanes
- New toll roads
- Managed facilities (new limited-access lanes constructed in the right-of-way of an arterial roadway)
- Truck toll lanes,
- Toll tunnels,
- Conversion of high occupancy vehicle (HOV) lanes to high occupancy toll (HOT) lanes.

Different methodological approaches were used for each of these project types when assessing viability with respect to the aforementioned screening criteria. The particular processes used and factors considered were explained in detail in the previously submitted Technical Memorandum, “First-Tier Screening Process and Findings.”

SUMMARY OF FINDINGS

Table ES-2 presents the final list of project corridors advancing to the second-tier analysis. A total of 12 project corridors are shown, some of which have multiple alternatives. The detailed results of this second-tier analysis are given in the following chapters. While somewhat more detailed than the broad-brush screening analysis documented in this chapter, this analysis is still preliminary in nature. Considerably more detailed studies would be needed, beyond the second-tier analysis, before any of these projects could proceed to actual financing.

Table ES-1
First-Tier Screening Projects

No.	Type	Type Description	Roadway	Project Limits
1	1	Managed Lanes	I-25	I-70 to Fort Collins
2	1	Managed Lanes	I-70	C-470 to I-25
3	1	Managed Lanes	I-70	I-25 to E-470
4	1	Managed Lanes	I-25	C-470 to Colorado Springs
5	1,5	Managed Lanes, Tunnel	I-70	Eagle to C-470
6	6	HOT Lanes	U.S. 36	I-25 to Boulder
7	3,6	Managed Facility, HOT Lanes	U.S. 85	I-25 to C-470
8	1	Managed Lanes	C-470	I-70 to I-25
9	1	Managed Lanes	I-25	Colorado Springs to Pueblo
10	1	Managed Lanes	I-76	I-70 to E-470
11	1	Managed Lanes	6th Avenue	C-470 to I-25
12	3	Managed Facility	U.S. 85	I-76 to U.S. 34
13	1	Managed Lanes	I-70	Utah to Eagle
14	1	Managed Lanes	I-225	S.H. 83 to I-70
15	3	Managed Facility	U.S. 40	C-470 to I-25
16	4	Truck Only Lanes	I-76	E-470 to Nebraska
17	2	New Toll Road	U.S. 24	I-25 to Limon (I-70)
18	3	Managed Facility	U.S. 24	S.H. 67 to I-25
19	1	Managed Lanes	I-25	Fort Collins to Wyoming State Line
20	3	Managed Facility	U.S. 285	Conifer to U.S. 85
21	2	New Toll Road	70 Business	SH 340 to I-70
22	3	Managed Facility	U.S. 34	I-25 to S.H. 85
23	6	HOT Lanes	S.H. 82	Glenwood Springs to Aspen
24	3	Managed Facility	U.S. 85	C-470 to I-25
25	4	Truck Only Lanes	I-70	E-470 to Kansas State Line
26	3	Managed Facility	S.H. 83	I-225 to E-470
27	3	Managed Facility	S.H. 119	Boulder to I-25
28	4	Truck Only Lanes	U.S. 287 Bypass	I-25 to Livermore
29	2	New Toll Road	Powers Boulevard	I-25 North to I-25 South
30	3	Managed Facility	S.H. 121	U.S. 36 to C-470
31	3	Managed Facility	S.H. 391	I-70 to U.S. 285
32	2	New Toll Road	U.S. 50	I-25 (Pueblo) to Kansas State Line
33	1	Managed Lanes	S.H. 58	S.H. 93(Golden) to I-70
34	2	New Toll Road	NW Corridor	U.S. 6 to NW Parkway
35	2	New Toll Road	S.H. 9	I-70 to U.S. 40
36	3	Managed Facility	S.H. 9	I-70 to Breckenridge
37	2	New Toll Road	Front Range	Fort Collins to Pueblo
38	2	New Toll Road	Banning-Lewis Parkway	Colorado Springs from I-25 N. to I-25 S.
39	1	Managed Lanes	I-270	US 36 to I-70

Table ES-2
Final Tier 2 Candidate Toll Facilities

Project Number	Roadway	Project Limits
1	I-25	I-70 to Fort Collins
3	I-70	I-25 to E-470
5	I-70	Idaho Springs/Eisenhower Tunnels
6	U.S. 36	I-25 to Boulder
8	C-470	I-70 to I-25
14	I-225	S.H. 83 to I-70
28	U.S. 287	I-25 to Livermore
29	Powers Boulevard	I-25 North to I-25 South
38	Banning-Lewis Parkway	Colorado Springs from I-25 N. to I-25 S.
34	NW Corridor	U.S. 6 to NW Parkway
37	Front Range	Fort Collins to Pueblo
39	I-270	I-70 to U.S. 36

PRELIMINARY ESTIMATES OF TRAFFIC AND REVENUE

Traffic and toll revenue estimates were prepared for the second-tier toll candidate projects. In total, there are 28 project alternatives in 12 general highway corridors. Seven of the highway corridors were located in the Denver area. The remaining five corridors were located in various areas including Fort Collins, Colorado Springs, the I-70 Mountain Corridor, and the eastern Front Range.

SECOND-TIER SCREENING STUDY APPROACH

This second-tier analysis has been conducted on a reduced number of project corridors and project scenarios, but made use of the travel demand models in developing traffic and revenue estimates. A more detailed analytical approach was also used in developing preliminary estimates of capital, operating and maintenance costs for each candidate toll project. The second-tier analysis also brought together these estimates of revenue and cost to evaluate the financial feasibility of each project.

ANALYSIS METHODOLOGY

Specific traffic models were prepared for managed lane type facilities, new toll routes, and tolling of existing facilities. In addition, a detailed review of the toll collection system was made.

Managed Lane Facilities – The traffic and revenue estimation process for the managed lanes projects was a multi-step process that incorporated actual traffic counts, travel time information collected from travel time runs, the regional travel demand model, and a micro-model of the corridors. Major work elements of this forecasting process included the following:

- Develop an existing traffic operations profile in each corridor;
- Develop a micro-model of each corridor with estimates of opening and future year global traffic demand;
- Estimate market share under tolled conditions; and
- Estimate annual revenue.

Tolling of New and Existing Facilities – The toll projects were represented in the models assuming the proposed highway network details, including interchange configurations and toll collection points. In general, traffic assignments were run for 2010, 2025 or 2030. A toll diversion model was utilized to estimate the market share for the toll road.

Optimum Toll Rates – For each of the project types a series of toll rates were evaluated. Each toll rate produces a unique number of toll transactions and toll revenue yield based factors such as the motorists' value of time, and prevailing operating conditions on the toll and non-toll routes for a particular time period. The optimum toll rate, which maximizes toll revenue, was selected for each of the projects for each time period by direction.

DENVER AREA PROJECTS

Presented in Table ES-3 is a list of the 14 second-tier candidate toll projects in the Denver area. The table provides the project location, limits and a brief description of the type of toll facility, either express toll lanes, of which there are 12 analyzed, or new toll roads of which there are two. These projects are depicted in Figure ES-2. A brief narrative describing each of the projects evaluated is provided below:

I-25 NORTH EXPRESS TOLL LANES – SCENARIOS 1 AND 2

- Scenario 1 - The I-25 North Scenario 1 project spans approximately 26 miles between S.H. 66 and U.S. 36. For this analysis, the project was subdivided into two sections with different improvement types. From S.H. 66 to 120th Avenue, I-25 was assumed to have three general purpose lanes and two express toll lanes in each direction. From 120th to U.S. 36, the assumption was that I-25 would have three general purpose lanes in each direction and two reversible express toll lanes. A separate on-going study is looking at the feasibility of converting the existing two-lane reversible high-occupancy vehicle (HOV) facility from U.S. 36 to downtown Denver to a two-lane reversible high-occupancy toll (HOT) facility. This HOV to HOT conversion has been assumed in this analysis.
- Scenario 2 - The I-25 North Scenario 2 project limits extend from S.H. 7 to U.S. 36, a distance of approximately 12 miles. From S.H. 7 to U.S. 36, I-25 was assumed to have three general purpose lanes in each direction and two reversible express toll lanes. As mentioned above, a separate on-going study is evaluating the feasibility of converting the existing two-lane reversible high-occupancy vehicle (HOV) facility from U.S. 36 to downtown Denver to a two-lane reversible high-occupancy toll (HOT) facility. This conversion has also been assumed in this scenario.

**Table ES-3
Second-Tier Denver Area Candidate Toll Projects**

No.	Location	Limits	Project Description (1)
1	U.S. 36 Express Toll lanes	I-25 to Cherryvale Road	Add one ETL/direction Cherryvale Rd. to McCaslin Blvd. and 2 ETL/direction from McCaslin to Pecos St.
2	C-470 Express Toll Lanes Scenario 1	I-25 to Wadsworth Boulevard	Add two ETL/direction I-25 to Wadsworth. Original DRCOG trip tables.
3	C-470 Express Toll Lanes Scenario 1A	I-25 to Wadsworth Boulevard	Add two ETL/direction I-25 to Wadsworth. Alternative trip table growth assumption.
4	C-470 Express Toll Lanes Scenario 2	I-25 to I-70	Add two ETL/direction I-25 to I-70. Original DRCOG trip tables.
5	C-470 Express Toll Lanes Scenario 2A	I-25 to I-70	Add two ETL/direction I-25 to I-70. Alternative trip table growth assumption.
6	I-25 Express Toll Lanes Scenario 1	U.S. 36 to S.H. 66	Add two express toll lanes (ETL) per direction from SH 66 to north of 120th; add two reversible ETL from 120th to 84th.
7	I-25 Express Toll Lanes Scenario 2	U.S. 36 to S.H. 7	Add two reversible ETL from SH 7 to 84th; convert existing HOV to HOT from 84th to US 36.
8	I-70 East Express Toll Lanes Scenario 1	I-25 to E-470	Add two ETL/direction I-25 to E-470.
9	I-70 East Express Toll Lanes Scenario 2	I-25 to Chambers Road	Add two ETL/direction I-25 to Chambers Rd.
10	I-70 East Express Toll Lanes Scenario 3	Colorado Boulevard to Chambers Road	Add two ETL/direction
11	I-225 Express Toll Lanes	I-70 to S.H. 83	Add two ETL/direction.
12	I-270 Express Toll Lanes	I-25 to I-70	Add two ETL/direction.
13	Northwest Corridor Scenario 1	NW Parkway/U.S. 36 to U.S. 6	New toll road from U.S. 36 to U.S. 6.
14	Northwest Corridor Scenario 2	S.H. 128 to S.H. 58	New four lane freeway from U.S. 36 to U.S. 6, but only tolled from S.H. 128 to S.H. 58.

(1) For analysis purposes only.



I-70 EAST EXPRESS TOLL LANES – SCENARIOS 1, 2 AND 3

Three I-70 east express toll lane scenarios were evaluated. The scenarios are:

- Scenario 1 – A 12-mile express toll lane project between I-25 and E-470, with the express toll lanes on elevated structure between I-25 and I-270. From I-25 to just east of I-270, the section would have three general purpose lanes in each direction, the majority of which is on elevated structure, and two express toll lanes each direction on elevated structure, located adjacent to the existing I-70 alignment on the north side. From just east of I-270 to just west of E-470, I-70 would vary between two (east of Chambers Road to E-470) and four (east of I-270 to east of Chambers Road) general purpose lanes, plus two express toll lanes in each direction located at-grade.
- Scenario 2 – A 9-mile express toll lane project between I-25 and Chambers Road, with the express toll lanes on elevated structure between I-25 and I-270; From I-25 to just east of I-270, the section would have three general purpose lanes in each direction, the majority of which is on elevated structure, and two express toll lanes each direction on elevated structure, located adjacent to the existing I-70 alignment on the north side. From just east of I-270 to Chambers, I-70 would have four general purpose lanes and two express toll lanes in each direction located at-grade. Within this section the express toll lanes are assumed to be located in the median of existing I-70 and separated from the general purpose lanes by a concrete barrier; and
- Scenario 3 – A 6-mile express toll lane project between Colorado Boulevard and Chambers Road, without the need for any portion of the express toll lanes to be on elevated structure. From just east of Colorado Boulevard to I-270, I-70 is assumed to have three general purpose lanes and two express toll lanes in each direction located at-grade. Within this section the express toll lanes are assumed to be located in the median of existing I-70 and separated from the general purpose lanes by a concrete barrier. It was assumed that the existing general purpose lanes would need to be reconstructed between Colorado and Chambers because the current median width is not sufficient to add express toll lanes in the median without impacting the general purpose lanes.

U.S. 36 EXPRESS TOLL LANES – SCENARIO 1

The U.S. 36 project extends from Foothills Parkway near the city limits of Boulder to the eastern terminus at I-25. The project is approximately 18 miles long and is subdivided into three sections with different improvement types. From Foothills Parkway to McCaslin Boulevard, the section is assumed to have two general purpose lanes and one express toll lane each direction. From McCaslin Boulevard to Pecos, it is assumed that U.S. 36 would have two general purpose lanes and two express toll lanes in each direction and from Pecos to I-25, the project assumes the conversion of the existing one-lane reversible high-occupancy vehicle (HOV) facility to a two-lane reversible high-occupancy toll (HOT) facility. The section is assumed to have two general purpose lanes in each direction.

I-225 EXPRESS TOLL LANES – SCENARIO 1

The I-225 project spans approximately eight miles from I-70 to Parker Road (S.H. 83) and was assumed to consist of two express toll lanes and two general purpose lanes in each direction. The express toll lanes were assumed to be located in the median of the existing roadway and separated from the general purpose lanes by a concrete barrier. The section of the corridor from Parker Road to 6th Avenue has received environmental clearance for constructing six general purpose lanes and is included in the current TIP program; however, the project has not been implemented due to a lack of funding. For the purposes of this study, it was assumed that the improvements identified in the 2000 Environmental Assessment would be implemented in conjunction with the express toll lanes with the exception that only four general purpose lanes would be reconstructed instead of six from Parker Road to 6th Avenue, as originally planned. North of 6th Avenue, a total of six general purpose lanes and four express toll lanes were assumed.

I-270 EXPRESS TOLL LANES – SCENARIO 1

The I-270 Scenario 1 project spans approximately five miles between I-25 and I-70. I-270 was assumed to have two general purpose and two express toll lanes in each direction. The express toll lanes were assumed to be located in the median of the existing roadway and separated from the general purpose lanes by a concrete barrier.

C-470 EXPRESS TOLL LANES – SCENARIOS 1, 1A, 2 AND 2A

Four C-470 express toll lane scenarios have been evaluated. The scenarios are as follows:

- Scenarios 1 and 1A – Both scenarios are approximately 14 miles in length, extending from just east of I-25 to Kipling Parkway. C-470 was assumed to have two general purpose and two express toll lanes in each direction from I-25 to east of Wadsworth Boulevard, and one express toll lane per direction from east of Wadsworth Boulevard to Kipling Parkway. The express toll lanes are assumed to be located in the median of the existing roadway and separated from the general purpose lanes by a concrete barrier, except for the segment between Kipling Parkway and east of Wadsworth which would be separated by a four foot buffer.
- Scenarios 2 and 2A – Both scenarios are approximately 26 miles in length and extend from just east of I-25 to I-70. Scenario 2 was assumed to have two general purpose and two express toll lanes in each direction along its entire length. (This was assumed for analysis purposes only. The WSA study team recognizes that there are currently six general purpose lanes between Morrison Road and I-70, and that Colorado law does not permit tolling of existing capacity.) The express toll lanes were assumed to be located in the median of the existing roadway and separated from the general purpose lanes by a concrete barrier.

Traffic and revenue estimates for Scenarios 1 and 2 were derived from the “base” DRCOG trip tables. Traffic and revenue estimates for Scenarios 1A and 2A were developed using an alternative traffic growth scenario between years 2010 and 2025.

NORTHWEST CORRIDOR TOLL ROAD – SCENARIOS 1 AND 2

Two scenarios were considered for this corridor:

- Scenario 1 - The Northwest Corridor Scenario 1 project was assumed to consist of developing a new roadway corridor between U.S. 36 and C-470, connecting it to the existing Northwest Parkway Tollway and completing the outer beltway around Denver. The new corridor was assumed to be approximately 24 miles long and include a four-lane roadway on new alignment. New interchanges were assumed at nine locations along the corridor at major interstate, highway and arterial crossings.
- Scenario 2 was assumed to follow the same alignment as Scenario 1, but the tolled section would only extend approximately 14 miles from S.H. 128 to S.H. 58. New interchanges were assumed at five locations along the corridor at major highway and arterial crossings. Since tolls were assumed to be levied along the S.H. 128 to S.H. 58 segment only, tolling of existing Highway 93 capacity would not occur.

PROJECTS OUTSIDE OF DENVER AREA

Five projects corridors were studied outside of the Denver area. These included: U.S. 287-I-25 Connector; Front Range Toll Road; Powers Boulevard; Banning Lewis Parkway; and the I-70 Mountain Corridor. Table ES-4 presents the list of project corridors and the 14 alternative project scenarios that were studied. A brief narrative describing the project alternatives evaluated is presented below:

PROPOSED U.S. 287-I-25 CONNECTOR

One scenario was considered for the corridor. The proposed scenario would build a new four lane toll road connecting U.S 287 (Livermore) to I-25.

The project corridor is located just north of the City of Fort Collins, as shown in Figure ES-3. It would provide a new high-speed east-west connector route between I-25 and U.S. 287, a distance of approximately 12 miles. The proposed route would provide for two lanes in both directions with assumed direct full connections at I-25 and U.S. 287. One full directional interchange was assumed to be provided in the vicinity of County Road 15/17.

PROPOSED FRONT RANGE TOLL ROAD

Two scenarios were considered for this corridor. These included:

- Scenario 1 assumes a new four lane toll road from I-25 N (at Fort Collins) to I-25S (south of Pueblo); and
- Scenario 2 assumes a new four lane toll road from I-25 N (at Fort Collins) to I-25S (north of Pueblo).

Table ES-4
Second-Tier Candidate Toll Projects
Colorado Springs, I-70 Mountain Corridor and Others Statewide

No.	Location	Limits	Project Description
1	U.S. 287 Corridor	U.S. 287 to I-25	Build two new toll lanes/direction on new alignment from U.S. 287 (Livermore) to I-25.
2	Front Range Toll Road Scenario 1	I-25N (at Fort Collins) to I-25S (south of Pueblo)	New four lane toll road with southern connection s/o Pueblo.
3	Front Range Toll Road Scenario 2	I-25N (at Fort Collins) to I-25S (north of Pueblo)	New four lane toll road with southern connection n/o Pueblo.
4	Powers Boulevard Scenario 1	I-25N (Northgate Rd.) to Woodmen Rd.	New four lane toll road from I-25N (Northgate) to Woodmen Road.
5	Powers Boulevard Scenario 2	I-25N (Northgate Rd.) to Drennan	New four lane toll road from I-25N (Northgate) to Drennan Road.
6	Powers Boulevard Scenario 3	I-25N (Northgate Rd.) to New Arterial	New four lane toll road from I-25N (Northgate) to new arterial s/o Fontaine Blvd.
7	Powers Boulevard Scenario 4	I-25N (Northgate Rd.) to Woodmen Rd. and I-25S to Powers Blvd.	New four lane toll road from I-25N (Northgate) to Woodmen Road and from I-25S to Powers Blvd. along new alignment near Drennan Rd. Powers from Woodmen to Drennan upgraded.
8	I-70 Mountain Corridor ETL Scenario 1	West of Eisenhower Tunnel to Floyd Hill	Add two reversible ETL from west of the Eisenhower Tunnel to Floyd Hill.
9	I-70 Mountain Corridor Scenario 2	Eisenhower Tunnel to Floyd Hill	Add one general purpose lane per direction from Eisenhower Tunnel to Floyd Hill. Add new bores at both tunnels and toll all lanes in WB direction. \$5 toll pays for entire roadway and tunnel improvement.
10	I-70 Mountain Corridor Scenario 3	Eisenhower Tunnel to Floyd Hill	Add one general purpose lane per direction from Eisenhower Tunnel to Floyd Hill. Add new bores at both tunnels and toll all lanes in WB direction. \$5 toll pays for costs of new tunnels, only.
11	I-70 Mountain Corridor Scenario 3A	Eisenhower Tunnel to Floyd Hill	Add one general purpose lane per direction from Eisenhower Tunnel to Floyd Hill. Add new bores at both tunnels and toll all lanes in WB direction. \$3 toll pays for costs of new tunnels, only.
12	I-70 Mountain Corridor Scenario 3B	Eisenhower Tunnel to Floyd Hill	Add one general purpose lane per direction from Eisenhower Tunnel to Floyd Hill. Add new bores at both tunnels and toll all lanes in WB direction. \$2 toll pays for costs of new tunnels, only.
13	Banning-Lewis Parkway Scenario 1	I-25N to I-25S at Fountain (unimproved Powers Blvd.)	New four lane toll road from I-25N (Northgate) to I-25S at Fountain, including an unimproved Powers Blvd.
14	Banning-Lewis Parkway Scenario 2	I-25N to I-25S at Fountain (improved Powers Blvd.)	New four lane toll road from I-25N (Northgate) to I-25S at Fountain, including an improved Powers Blvd.



The proposed Front Range Toll Road corridor extends 194 miles along the Front Range of the Rocky Mountains. As shown in Figure ES-4, it traverses seven counties with East Central Colorado, including Larimer, Weld, Adams, Arapahoe, Elbert, El Paso, and Pueblo Counties. Two alternative alignments were studied for the Front Range Toll Road. Each of the two scenarios had a northern terminus at I-25, north of Fort Collins at the Wellington Interchange. For the southern terminus, Scenario 1 had an interchange with I-25 south of the St. Charles River, south of Pueblo; whereas Scenario 2 would have an interchange with I-25 north of Pueblo.

COLORADO SPRINGS AREA PROJECTS

Figure ES-5 shows the two core projects are potential toll facility candidate projects evaluated in the Greater Colorado Springs area. These include Powers Boulevard and the proposed Banning-Lewis Parkway. Several scenarios were evaluated for the different corridors, one of which would combine portions of the two projects.

The Powers Boulevard Corridor would include both potentially completing connections along existing Powers Boulevard to and from I-25 on the north and south and the possibility of upgrading the existing Powers Boulevard from a major arterial to a fully limited access facility.

The proposed Banning-Lewis Parkway would be constructed in a major plan development along the eastern edge of Colorado Springs generally referred to as Banning-Lewis Ranch. That project, if fully built out, would substantially increase the size of the Colorado Springs region. However, most of that planned development is scheduled for subsequent to the year 2020, which results in relatively low early demand for Banning-Lewis Parkway in the early years of the traffic and revenue analysis.

PROPOSED POWERS BOULEVARD CORRIDOR

Four scenarios were considered for this corridor. These included:

- Scenario 1 – a new four lane toll road from I-25N (Northgate) to Woodmen Road;
- Scenario 2 – a new four lane toll road from I-25N (Northgate) to Drennan Road;
- Scenario 3 – a new four lane toll road from I-25N (Northgate) to south of Fountaine Boulevard;
- Scenario 4 – a new four lane toll road from I-25N (Northgate) to Woodmen Road plus a new four lane east-west toll road in the Drennan Road corridor connecting I-25 to the Colorado Springs Airport,

PROPOSED BANNING LEWIS CORRIDOR

Two scenarios were considered for the Banning Lewis Corridor. These included:

- Scenario 1 – a new four lane toll road from I-25N (Northgate) to I-25S at Fountaine Boulevard, assuming an unimproved Powers Boulevard; and

- Scenario 2 – a new four lane toll road from I-25N (Northgate) to I-25S at Fountaine Boulevard, assuming an improved Powers Boulevard.

PROPOSED I-70 MOUNTAIN CORRIDOR

These projects covered improvements to I-70 generally between the Eisenhower Tunnel and Floyd Hill, representing a length of approximately 35-miles, as shown in Figure ES-6. These included:

- Scenario 1 – Two lane reversible express toll project from west of the Eisenhower Tunnel to Floyd Hill. Add new bores at the Eisenhower and Twin Tunnels;
- Scenario 2 – Add one general purpose lane in both directions from Eisenhower Tunnel to Floyd Hill. Add new bores at Eisenhower and Twin Tunnels. Collect tolls in a one-way direction. \$5.00 toll pays for cost of tunnels and roadways;
- Scenario 3 – Add one general purpose lane in both directions from Eisenhower Tunnel to Floyd Hill. Add new bores at Eisenhower and Twin Tunnels. Collect tolls in a one-way direction. \$5.00 toll pays for cost of tunnels only;
- Scenario 3a – Add one general purpose lane in both directions from Eisenhower Tunnel to Floyd Hill. Add new bores at Eisenhower and Twin Tunnels. Collect tolls in a one-way direction. \$3.00 toll pays for cost of tunnels only; and
- Scenario 3b – Add one general purpose lane in both directions from Eisenhower Tunnel to Floyd Hill. Add new bores at Eisenhower and Twin Tunnels. Collect tolls in a one-way direction. \$2.00 toll pays for cost of tunnels only;

It should be noted that these five scenarios were developed for analysis purposes only. The WSA study team recognizes that Colorado law precludes tolling of existing capacity, but Federal law allows tolling of existing bridges and tunnels for reconstruction or for providing additional capacity.

SUMMARY OF TOLL TRIPS AND TOLL REVENUE

Table ES-5 presents a summary of toll trips and revenues for each project for the assumed opening year (2010) and a future year (2025).

PRELIMINARY PROJECT COST ESTIMATES

GENERAL METHODOLOGY

This section describes the approach used to estimate roadway capital costs and annual operations and maintenance (O&M) costs for the candidate toll projects for the second-tier study. In the first-tier study, the necessary roadway improvements were identified at a sketch-planning level to meet each individual corridor development plan. Program-planning level cost estimates were

**Table ES-5
Annual Trips and Revenue
Second-Tier Candidate Toll Projects
Colorado Springs, I-70 Mountain Corridor and Others Statewide**

No.	Location	Projects	Limits	Annual Trips (000)			Annual Revenue (000)		
				2010	2015	2025	2010	2015	2025
1	U.S. 287 Corridor	U.S. 287 to I-25		734	797	922	\$1,995	\$2,289	\$2,877
2	Front Range Toll Road Scenario 1	I-25N (at Fort Collins) to I-25S (south of Pueblo)		10,001	11,790	15,330	81,044	95,199	123,405
3	Front Range Toll Road Scenario 2	I-25N (at Fort Collins) to I-25S (north of Pueblo)		9,928	11,680	15,184	76,323	90,116	117,802
4	Powers Boulevard Scenario 1	I-25N (Northgate Rd.) to Woodmen Rd.		9,813	11,754	15,635	11,231	13,728	18,721
5	Powers Boulevard Scenario 2	I-25N (Northgate Rd.) to Drennan		34,582	42,090	57,105	45,108	54,498	73,279
6	Powers Boulevard Scenario 3	I-25N (Northgate Rd.) to New Arterial		42,329	49,623	64,209	52,516	63,582	85,716
7	Powers Boulevard Scenario 4	I-25N (Northgate Rd.) to Woodmen Rd. and I-25S to Powers Blvd.		14,165	16,807	22,091	15,605	19,182	26,335
8	I-70 Mountain Corridor ETL Scenario 1	West of Eisenhower Tunnel to Floyd Hill		1,871	2,134	2,778	5,752	9,917	29,477
9	I-70 Mountain Corridor Scenario 2	Eisenhower Tunnel to Floyd Hill		16,120	16,995	18,891	95,290	100,466	111,674
10	I-70 Mountain Corridor Scenario 3	Eisenhower Tunnel to Floyd Hill		16,120	16,995	18,891	95,290	100,466	111,674
11	I-70 Mountain Corridor Scenario 3A	Eisenhower Tunnel to Floyd Hill		18,152	19,207	21,505	64,385	68,128	76,280
12	I-70 Mountain Corridor Scenario 3B	Eisenhower Tunnel to Floyd Hill		19,235	20,329	22,709	45,486	48,073	53,699
13	Banning-Lewis Parkway Scenario 1	I-25N to I-25S at Fountain (unimproved Powers Blvd.)		10,095	13,560	20,490	10,486	15,034	24,130
14	Banning-Lewis Parkway Scenario 2	I-25N to I-25S at Fountain (improved Powers Blvd.)		13,698	16,836	23,112	12,790	16,443	23,748



developed by using unit cost per lane-mile factors and all costs were expressed as ranges. For each improvement type, the unit-costs per lane-mile were developed to represent typical applications and were adjusted appropriately for special considerations such as major bridge crossings and interchanges. The construction costs for each project were then compared with a relative measure of the project's projected toll revenue to determine its Relative Feasibility Index.

Within the second-tier study, more detailed cost estimates were developed for a smaller, refined list of selected projects found to warrant further study in the first-tier study, using recent bid tabulations and other construction cost-related data to create unit cost build up tables based on similar CDOT roadway projects. The second-tier study was still considered a preliminary feasibility analysis. The analyses were not conducted to a sufficient level of detail to be used in support of actual project financing, but were of sufficient precision to identify those projects or elements of project corridors that were potentially feasible as toll facilities and could warrant further study at an investment grade study level as part of the project implementation process. All cost analyses were estimated in current 2004 dollars and cost inflationary factors and the additional costs associated with toll collection facilities were applied if cost estimates from previous studies or reports were used.

As part of the second-tier study, the toll collection system capital, operations and maintenance costs were estimated. Although the toll collection system capital costs are always a small percentage of the toll facility construction (i.e., capital) costs, the toll system always provides some schedule completion risk, potentially delaying the start of revenue operations. A significant component of this risk is the complexity of the System. Since there is considerable variation on toll systems capital costs, component identification and unit pricing accomplishes both a more complete understanding of the system design and a price that is within a reasonable realm of possibilities, given a number of unknowns.

System capital costs are subdivided into multiple distinct categories, each with multiple unit items deemed to have a high probability of being implemented. Item quantities are derived from the number of tolling points, length of the facility, and location of the facility. The same process was used for developing operations and maintenance costs, but with only two categories. However, operations costs are dominated by the electronic toll collection (ETC) costs derived from modeled traffic and trip data and converted to an annual cost using an industry supported per trip unit price. Conversely, violation transactions, the single alternative to ETC trip transactions, are assumed to derive revenue from issued citations that exactly equals all costs incurred to processing the violation. Except for the first year of operations, this has proved to be a valid assumption since the Agency can adjust operations as needed. All cost analyses were estimated in current 2004 dollars.

ESTIMATED ROADWAY CAPITAL COSTS

For the roadway capital costs, a review of existing and planned roadway infrastructure was performed to determine the extent and nature of the existing roadway infrastructure. The necessary roadway improvements were then determined to meet each corridor's proposed development plan. These typical roadway characteristics were developed based on current CDOT standards and AASHTO guidelines. For those projects where an environmental study has

been recently completed or is currently ongoing, adjustments were made to these characteristics/parameters based on the assumptions made in the corridor/EIS studies or recently completed construction. The Colorado Department of Transportation's geographic information systems (GIS) database was used to characterize the existing conditions of each candidate toll project, as well as windshield-surveys.

Utilizing available project cost information from Colorado for similar facilities, cost estimates from earlier studies, and previous cost estimation experience, unit cost factors were developed for each improvement type to represent the corridor improvement costs. Capital cost estimates included grading, drainage, surfacing and paving for an interstate-type facility. In addition, unit costs were developed for interchanges, bridges and other structures such as elevated ramps and retaining walls. Terrain conditions were identified based on available information from the Colorado Department of Transportation GIS database. Other incidental costs included consideration of erosion control, signing and pavement marking, maintenance of traffic during construction, traffic control and mobilization, construction staking and inspection and utility relocations.

Appropriate add-ons for "soft" costs associated with engineering design, right-of-way acquisition, and program management and administration were considered to develop a total capital cost. A contingency of 20 percent was added to each project to account for design unknowns. All cost analyses were estimated in current 2004 dollars and cost inflationary factors and the additional costs associated with toll collection facilities were applied if cost estimates from previous studies or reports were used in the study.

For each project, the type and location of access points for the toll system was taken into account as a part of the capital cost estimates. The beginning and ending of each toll system was assumed to have a transition area between the general purpose lanes and the express toll lanes, in order to provide time and distance to add or drop the express toll lanes. Figure ES-7 shows an example application for a transition area.

The majority of the access to the express toll lanes was assumed to occur through the use of slip toll access points located between existing interchanges. Figure ES-8 shows a typical application of slip toll access for barrier-separated express toll lanes located in the median of an existing roadway. For direct system connections, such as between the toll system of I-70 East and I-225, direct ramp toll access through flyover ramps was assumed. Figure ES-9 shows an example of direct ramp toll access. For each project, the location of transition areas, slip and direct toll access can be seen on each project's individual information sheet, shown in several Figures throughout the remainder of this chapter. For those projects on new alignment, such as the Front Range project, all capacity would be tolled through electronic toll collection so no exclusive toll access is required.

To provide flexibility in the evaluation of a corridor's financial feasibility, a range of construction improvements or "scenarios" were provided as necessary on a corridor-by-corridor basis. This provision allowed for adjustments to the facility type, improvements or limits to maximize the potential financial viability of a corridor or corridors, depending on corridor packaging. By providing a range of scenarios for a particular corridor, appropriate

considerations can then be given to the sensitivity of a corridor's financial feasibility to the cost side of the feasibility equation. Table ES-6 shows the roadway capital cost for each project in 2004 dollars.

ESTIMATED TOLL COLLECTION CAPITAL COSTS

The estimated toll system capital costs are shown in Table ES-7. The capital costs are typically subdivided into the following categories for each project:

- Structures
- Communications
- Power Electronic Toll Collection
- Vehicle Detection and Violation Trigger
- Violation Enforcement
- Lane Processing
- Vehicle Access
- Host Processing
- Project Delivery

The primary assumptions made in developing these tables was for single tolling point facilities, a roadside cabinet was used. For multi-tolling point projects, a communication backbone is installed that is routed for the approximate length of the facility to interconnect tolling points and provide flexibility in locating dynamic and changeable signs. Toll and communication buildings are installed at each toll point. Facilities that included the toll and communication building also included costs associated with a remotely monitored security access control system. Reversible lane facilities include costs for gate access control. Finally, the tunnel toll plaza project includes manual equipment costs. All capital cost estimates for each project are in 2004 dollars.

ESTIMATED ROADWAY ANNUAL OPERATIONS AND MAINTENANCE COST

Annual roadway operations and maintenance (O&M) costs were developed for each project. The derivation was, in part, based on the experiences of the other turnpike systems currently in operation in Colorado (E-470 and Northwest Parkway), other express toll systems in operation throughout the country, and team experience on other similar toll studies. O&M costs refer to the perpetual costs associated with the operations and upkeep of the turnpike system. These costs represent the annual revenue necessary to responsibly operate and maintain the toll road in a manner similar with customary practice. The annual roadway O&M costs for each project included cost estimates for the following cost categories:

- Insurance
- Colorado State Patrol (CSP)
- Roadway
- Facility Maintenance.
- Engineering/Traffic Consulting

Table ES-8 shows the roadway annual O&M cost estimates for each project in 2004 dollars.

Table ES-6
Summary of Roadway Capital Cost Estimates
Second-Tier Candidate Toll Projects

Location	Limits	Length (miles)	Roadway Capital Costs (000)	Roadway Cost per Mile (000)
I-25 Express Toll Lanes Scenario 1	U.S. 36 to S.H. 66	26	\$ 299,200	\$ 11,508
I-25 Express Toll Lanes Scenario 2	U.S. 36 to S.H. 7	12	225,800	18,817
I-70 East Express Toll Lanes Scenario 1	I-25 to E-470	12	648,000	54,000
I-70 East Express Toll Lanes Scenario 2	I-25 to Chambers Road	8	555,200	69,400
I-70 East Express Toll Lanes Scenario 3	Colorado to Chambers Road	6	258,600	43,100
U.S. 36 Express Toll Lanes	I-25 to Foothills Parkway	18	1,206,100	67,006
I-225 Express Toll Lanes	I-70 to S.H. 83	8	171,600	21,450
I-270 Express Toll Lanes	I-25 to I-70	5	205,700	38,093
C-470 Express Toll Lanes Scenario 1, 1A	I-25 to Kipling	14	314,200	22,443
C-470 Express Toll Lanes Scenario 2, 2A	I-25 to I-70	26	514,000	19,769
Northwest Corridor Toll Road Scenario 1	C-470 to NW Parkway/US 36	24	852,600	35,525
Northwest Corridor Toll Road Scenario 2	SH 128 to SH 58	14	319,200	22,800
I-70 West Toll Road Scenario 1	West of Eisenhower Tunnel to Floyd Hill	34	2,603,500	76,574
I-70 West Toll Road Scenario 2	Eisenhower Tunnel to Floyd Hill	34	2,480,300	72,950
I-70 West Toll Road Scenario 3, 3A, 3B	Eisenhower Tunnel and Twin Tunnel	5	639,200	127,840
U.S. 287 Bypass Toll Road	U.S. 287 to I-25 Connector	12	142,200	11,850
Powers Boulevard Toll Road Scenario 1	I-25N (Northgate Rd.) to Woodmen Rd.	9	175,200	19,467
Powers Boulevard Toll Road Scenario 2	I-25N (Northgate Rd.) to Drennan	21	550,000	26,190
Powers Boulevard Toll Road Scenario 3	I-25N (Northgate Rd.) to New Arterial	27	722,100	26,744
Powers Boulevard Toll Road Scenario 4	Following Drennan Alignment	12	229,600	19,133
Banning-Lewis Parkway Toll Road Scenario 1	I-25N to I-25S at Fountain (unimproved Powers Blvd.)	31	573,600	18,503
Banning-Lewis Parkway Toll Road Scenario 2	I-25N to I-25S at Fountain (improved Powers Blvd.)	31	573,600	18,503
Front Range Toll Road Scenario 1	I-25N (at Fort Collins) to I-25S (south of Pueblo)	194	2,344,100	12,083
Front Range Toll Road Scenario 2	I-25N (at Fort Collins) to I-25S (north of Pueblo)	169	1,979,400	11,712
I-25 Sc 1/U.S. 36/I-270/I-70E Sc 3/I-225 Toll System	System	62	2,894,700	46,689

**Table ES-7
Summary of Toll Collection Capital Cost Estimates
Second-Tier Candidate Toll Projects**

Location	Limits	Length (miles)	Toll Collection Capital Costs (000)
I-25 Express Toll Lanes Scenario 1	U.S. 36 to S.H. 66	26	\$ 7,820
I-25 Express Toll Lanes Scenario 2	U.S. 36 to S.H. 7	12	6,640
I-70 East Express Toll Lanes Scenario 1	I-25 to E-470	12	4,812
I-70 East Express Toll Lanes Scenario 2	I-25 to Chambers Road	8	4,577
I-70 East Express Toll Lanes Scenario 3	Colorado to Chambers Road	6	4,577
U.S. 36 Express Toll Lanes	I-25 to Foothills Parkway	18	7,500
I-225 Express Toll Lanes	I-70 to S.H. 83	8	3,241
I-270 Express Toll Lanes	I-25 to I-70	5	3,168
C-470 Express Toll Lanes Scenario 1, 1A	I-25 to Kipling	14	5,707
C-470 Express Toll Lanes Scenario 2, 2A	I-25 to I-70	26	7,706
Northwest Corridor Toll Road Scenario 1	C-470 to NW Parkway/US 36	24	6,240
Northwest Corridor Toll Road Scenario 2	SH 128 to SH 58	14	6,240
I-70 West Toll Road Scenario 1	West of Eisenhower Tunnel to Floyd Hill	34	7,305
I-70 West Toll Road Scenario 2	Eisenhower Tunnel to Floyd Hill	34	6,279
I-70 West Toll Road Scenario 3, 3A, 3B	Eisenhower Tunnel and Twin Tunnel	5	6,279
U.S. 287 Bypass Toll Road	U.S. 287 to I-25 Connector	12	2,840
Powers Boulevard Toll Road Scenario 1	I-25N (Northgate Rd.) to Woodmen Rd.	9	9,022
Powers Boulevard Toll Road Scenario 2	I-25N (Northgate Rd.) to Drennan	21	13,715
Powers Boulevard Toll Road Scenario 3	I-25N (Northgate Rd.) to New Arterial	27	16,375
Powers Boulevard Toll Road Scenario 4	Following Drennan Alignment	12	16,375
Banning-Lewis Parkway Toll Road Scenario 1	I-25N to I-25S at Fountain (unimproved Powers Blvd.)	31	10,408
Banning-Lewis Parkway Toll Road Scenario 2	I-25N to I-25S at Fountain (improved Powers Blvd.)	31	10,408
Front Range Toll Road Scenario 1	I-25N (at Fort Collins) to I-25S (south of Pueblo)	194	17,649
Front Range Toll Road Scenario 2	I-25N (at Fort Collins) to I-25S (north of Pueblo)	169	16,919
I-25 Sc 1/U.S. 36/I-270/I-70E Sc 3/I-225 Toll System	System	62	23,641

Table ES-8
Summary of Roadway Operation and Maintenance Cost Estimates
Second-Tier Candidate Toll Projects

Location	Limits	Length (miles)	Roadway O&M Costs
I-25 Express Toll Lanes Scenario 1	U.S. 36 to S.H. 66	26	\$ 1,980,000
I-25 Express Toll Lanes Scenario 2	U.S. 36 to S.H. 7	12	1,110,000
I-70 East Express Toll Lanes Scenario 1	I-25 to E-470	12	1,370,000
I-70 East Express Toll Lanes Scenario 2	I-25 to Chambers Road	8	1,100,000
I-70 East Express Toll Lanes Scenario 3	Colorado to Chambers Road	6	1,000,000
U.S. 36 Express Toll Lanes	I-25 to Foothills Parkway	18	1,690,000
I-225 Express Toll Lanes	I-70 to S.H. 83	8	1,110,000
I-270 Express Toll Lanes	I-25 to I-70	5	960,000
C-470 Express Toll Lanes Scenario 1, 1A	I-25 to Kipling	14	1,460,000
C-470 Express Toll Lanes Scenario 2, 2A	I-25 to I-70	26	2,160,000
Northwest Corridor Toll Road Scenario 1	C-470 to NW Parkway/US 36	24	2,040,000
Northwest Corridor Toll Road Scenario 2	SH 128 to SH 58	14	1,460,000
I-70 West Toll Road Scenario 1	West of Eisenhower Tunnel to Floyd Hill	34	2,440,000
I-70 West Toll Road Scenario 2	Eisenhower Tunnel to Floyd Hill	34	2,440,000
I-70 West Toll Road Scenario 3, 3A, 3B	Eisenhower Tunnel and Twin Tunnel	5	1,360,000
U.S. 287 Bypass Toll Road	U.S. 287 to I-25 Connector	12	1,350,000
Powers Boulevard Toll Road Scenario 1	I-25N (Northgate Rd.) to Woodmen Rd.	9	1,170,000
Powers Boulevard Toll Road Scenario 2	I-25N (Northgate Rd.) to Drennan	21	1,870,000
Powers Boulevard Toll Road Scenario 3	I-25N (Northgate Rd.) to New Arterial	27	2,220,000
Powers Boulevard Toll Road Scenario 4	Following Drennan Alignment	12	1,370,000
Banning-Lewis Parkway Toll Road Scenario 1	I-25N to I-25S at Fountain (unimproved Powers Blvd.)	31	2,450,000
Banning-Lewis Parkway Toll Road Scenario 2	I-25N to I-25S at Fountain (improved Powers Blvd.)	31	2,450,000
Front Range Toll Road Scenario 1	I-25N (at Fort Collins) to I-25S (south of Pueblo)	194	14,500,000
Front Range Toll Road Scenario 2	I-25N (at Fort Collins) to I-25S (north of Pueblo)	169	13,050,000
I-25 Sc 1/U.S. 36/I-270/I-70E Sc 3/I-225 Toll System	System	62	6,640,000

ESTIMATED TOLL COLLECTION ANNUAL OPERATIONS AND MAINTENANCE COST

Annual toll collection O & M costs are shown in Table ES-9 for each of the projects. The two categories of costs that apply to all projects are administration and maintenance.

For operations, the cost to process, store, transfer, reconcile and report ETC transactions dominates all other operations cost. This cost is derived by using the calculated trips and an industry supported unit price. The only alternative transaction for express lane operations, violation transactions, are assumed to be revenue neutral.

The maintenance category includes the cost to maintain the field level toll system equipment. Annual O & M cost estimates for each project is in 2004 dollars.

ANNUAL REPLACEMENT FUND DEPOSIT

Included in the annual costs of a toll system are replacement reserve fund considerations. On an annual basis, the Replacement Fund Deposit needs to be deposited for the replacement of the system's infrastructure to replace or refurbish the system at the end of its service life, assumed to be 30 years. The depreciation of the system's value is a function of the system's use and the extent that annual maintenance activities are able to defer major system reconstruction.

For each project, the annual replacement fund deposit value estimated includes only the portion of construction costs and right-of-way associated with the toll facility and was not based on costs associated with improvements/reconstruction of the general purpose lanes.

Table ES-10 shows the annual cost estimate for the Replacement Fund Deposit for each project.

FINANCIAL ANALYSIS

The study team evaluated the financial feasibility of the CDOT's second-tier candidate toll projects to assist CDOT in determining the priority and economic feasibility of the projects. This comprehensive evaluation encompassed 12 individual express toll and/or managed lane projects, including multiple construction/design approaches for certain projects. In all, the financial feasibility for 28 individual project scenarios was reviewed.

Three main themes resulted from this analysis:

- 1) Targeting for early completion programs that can fully fund construction costs through toll revenues (i.e., without requiring federal, state and/or local monies);
- 2) Combining certain toll roads into a "Regional System" allows the more economical toll roads to "leverage up" less economical toll roads, resulting in a more efficient use of toll revenues, reduced total dependence on governmental monies, and provides for a more cohesive financing; and
- 3) Supporting projects with some federal/state monies to enhance statewide project completion feasibility.

Table ES-9
Summary of Toll Collection Operation and Maintenance Cost Estimates
Second-Tier Candidate Toll Projects

Location	Limits	Length (miles)	Toll Collection Operation and Maintenance Costs (Opening Year)
I-25 Express Toll Lanes Scenario 1	U.S. 36 to S.H. 66	26	\$ 2,045,000
I-25 Express Toll Lanes Scenario 2	U.S. 36 to S.H. 7	12	1,358,000
I-70 East Express Toll Lanes Scenario 1	I-25 to E-470	12	2,471,000
I-70 East Express Toll Lanes Scenario 2	I-25 to Chambers Road	8	2,419,000
I-70 East Express Toll Lanes Scenario 3	Colorado to Chambers Road	6	2,437,000
U.S. 36 Express Toll Lanes	I-25 to Foothills Parkway	18	2,275,000
I-225 Express Toll Lanes	I-70 to S.H. 83	8	1,720,000
I-270 Express Toll Lanes	I-25 to I-70	5	1,513,000
C-470 Express Toll Lanes Scenario 1, 1A	I-25 to Kipling	14	2,017,000
C-470 Express Toll Lanes Scenario 2, 2A	I-25 to I-70	26	2,727,000
Northwest Corridor Toll Road Scenario 1	C-470 to NW Parkway/US 36	24	3,043,000
Northwest Corridor Toll Road Scenario 2	SH 128 to SH 58	14	3,412,000
I-70 West Toll Road Scenario 1	West of Eisenhower Tunnel to Floyd Hill	34	1,294,000
I-70 West Toll Road Scenario 2	Eisenhower Tunnel to Floyd Hill	34	3,171,000
I-70 West Toll Road Scenario 3, 3A, 3B	Eisenhower Tunnel and Twin Tunnel	5	3,171,000
U.S. 287 Bypass Toll Road	U.S. 287 to I-25 Connector	12	830,000
Powers Boulevard Toll Road Scenario 1	I-25N (Northgate Rd.) to Woodmen Rd.	9	2,026,000
Powers Boulevard Toll Road Scenario 2	I-25N (Northgate Rd.) to Drennan	21	4,908,000
Powers Boulevard Toll Road Scenario 3	I-25N (Northgate Rd.) to New Arterial	27	5,833,000
Powers Boulevard Toll Road Scenario 4	Following Drennan Alignment	12	2,578,000
Banning-Lewis Parkway Toll Road Scenario 1	I-25N to I-25S at Fountain (unimproved Powers Blvd.)	31	2,192,000
Banning-Lewis Parkway Toll Road Scenario 2	I-25N to I-25S at Fountain (improved Powers Blvd.)	31	2,588,000
Front Range Toll Road Scenario 1	I-25N (at Fort Collins) to I-25S (south of Pueblo)	194	2,968,000
Front Range Toll Road Scenario 2	I-25N (at Fort Collins) to I-25S (north of Pueblo)	169	2,960,000
I-25 Sc 1/U.S. 36/I-270/I-70E Sc 3/I-225 Toll System	System	62	8,843,000

Table ES-10
Summary of Annual Reserve Maintenance Fund Deposit Cost Estimates
Second-Tier Candidate Toll Projects

Location	Limits	Length (miles)	Replacement Fund Deposit
I-25 Express Toll Lanes Scenario 1	U.S. 36 to S.H. 66	26	\$ 380,000
I-25 Express Toll Lanes Scenario 2	U.S. 36 to S.H. 7	12	290,000
I-70 East Express Toll Lanes Scenario 1	I-25 to E-470	12	660,000
I-70 East Express Toll Lanes Scenario 2	I-25 to Chambers Road	8	570,000
I-70 East Express Toll Lanes Scenario 3	Colorado to Chambers Road	6	260,000
U.S. 36 Express Toll Lanes	I-25 to Foothills Parkway	18	1,150,000
I-225 Express Toll Lanes	I-70 to S.H. 83	8	200,000
I-270 Express Toll Lanes	I-25 to I-70	5	200,000
C-470 Express Toll Lanes Scenario 1, 1A	I-25 to Kipling	14	540,000
C-470 Express Toll Lanes Scenario 2, 2A	I-25 to I-70	26	880,000
Northwest Corridor Toll Road Scenario 1	C-470 to NW Parkway/US 36	24	1,390,000
Northwest Corridor Toll Road Scenario 2	SH 128 to SH 58	14	550,000
I-70 West Toll Road Scenario 1	West of Eisenhower Tunnel to Floyd Hill	34	3,310,000
I-70 West Toll Road Scenario 2	Eisenhower Tunnel to Floyd Hill	34	3,160,000
I-70 West Toll Road Scenario 3, 3A, 3B	Eisenhower Tunnel and Twin Tunnel	5	1,080,000
U.S. 287 Bypass Toll Road	U.S. 287 to I-25 Connector	12	240,000
Powers Boulevard Toll Road Scenario 1	I-25N (Northgate Rd.) to Woodmen Rd.	9	150,000
Powers Boulevard Toll Road Scenario 2	I-25N (Northgate Rd.) to Drennan	21	470,000
Powers Boulevard Toll Road Scenario 3	I-25N (Northgate Rd.) to New Arterial	27	620,000
Powers Boulevard Toll Road Scenario 4	Following Drennan Alignment	12	200,000
Banning-Lewis Parkway Toll Road Scenario 1	I-25N to I-25S at Fountain (unimproved Powers Blvd.)	31	980,000
Banning-Lewis Parkway Toll Road Scenario 2	I-25N to I-25S at Fountain (improved Powers Blvd.)	31	980,000
Front Range Toll Road Scenario 1	I-25N (at Fort Collins) to I-25S (south of Pueblo)	194	4,040,000
Front Range Toll Road Scenario 2	I-25N (at Fort Collins) to I-25S (north of Pueblo)	169	3,400,000
I-25 Sc 1/U.S. 36/I-270/I-70E Sc 3/I-225 Toll System	System	62	2,750,000

METHODOLOGY FOR PRO FORMAS

The assumptions incorporated into the analyses include project capital costs, annual toll revenues, operations and maintenance costs (both roadway and toll collection), and renewal and replacement fund deposits. Each project assumed an opening date of January 1, 2010 and a three-year construction period.

The project cost factors share the following characteristics:

- Project Costs – provided in 2004 dollars, inflated at 5.0 percent annually to 2010;
- Annual Toll Revenues – provided in 2004 dollars, inflated at 2.5 percent from 2004 to year of revenue generation;
- Roadway and Toll Collection Operations and Maintenance – provided in 2004 dollars, inflated at 3.0 percent from 2004 to year of incurred expense; and
- Annual Renewal and Replacement Fund Deposit – provided in 2004 dollars, inflated at 3.0 percent from 2004 to year of incurred expense.

Each project was evaluated utilizing the same financial methodology:

First, the total costs for each scenario assumed the combination of project costs and bond costs. Bond costs for each scenario incorporated the following assumptions:

- Cost of Issuance – assumed at 2.0 percent of total senior lien bonds to fund estimated standard bond issuance expenses including legal fees, underwriting fees and rating agency fees, among others;
- Capitalized Interest – three years;
- Interest Earnings on Capitalized Interest and Construction Fund - 1.5 percent for three years;
- Construction Fund Adjustment – 4.5 percent loss on fund balance for three years (difference between borrowing cost and fund earnings);
- Debt Service Reserve Fund – 10.0 percent of senior lien principal; and
- Interest Rates – Current rates and, for the market sensitivity analysis, current rates plus 100 bps.

Second, each scenario was stressed to maximize the amount of senior lien bonds that could be issued, subject to certain constraints. These constraints, as listed below, are those likely to be imposed upon a start-up toll road bond program by rating agencies, bond insurers and/or investors.

- Principal Amortization Period – 30-years;
- Senior Lien Coverage Requirement – 1.75 times net revenues. Net revenues equal gross toll revenues less annual operation and maintenance expenses, plus annual debt service reserve fund interest earnings;
- Interest Rates on Senior Lien Current Interest Bonds – rates of August 9, 2004; and
- Interest Rates on Senior Lien Capital Appreciation Bonds – Current interest bond rates of August 9, 2004 plus 0.75 percent.

The financial methodology employed is based on industry practice and comparable startup toll road methodologies. Startup toll roads' senior lien financial structure must be rated at least "investment grade" ("BBB-" or greater) by one of the three major rating agencies to obtain efficient, broad market access. In general, ratings agencies assign BBB- credit ratings to start-up toll roads that meet a minimum senior lien coverage constraint of 1.75 times, have a reliable traffic and revenue study and have a strong management team. This credit assessment is especially true for toll facilities when not all lanes are tolled and when revenues must be generated in a concentrated time period. The coverage for a toll road is calculated by dividing total net revenues by total debt service (i.e., the road must project at least \$1.75 in annual net revenues for each \$1.00 of annual bond debt service).

REVIEW AND SELECTION OF ALTERNATIVES

Table ES-11 lists each scenario in order of financial feasibility. The alternatives are presented in order of "Percentage of Project Cost," representing the percentage of each project's costs paid from a maximum issuance of senior lien bonds (subject to the previously mentioned constraints) and equity contributions from federal, state and/or local sources (also subject to constraints, as described in the next paragraph). Projects above the blackline are those able to fund at least 70 percent of total project costs through these sources, and thus are deemed more probably financially feasible. Upon review of the projects and comparable industry standards, the study team concluded that such projects have a strong likelihood of financial feasibility as either additional senior bonds or subordinated bonds (with slightly lower coverage constraints of 1.30 times combined debt service coverage) could fund the remaining project costs.

Table ES-11
Summary of All Alternatives Evaluated

Project	Total 2010 Project Cost with COI	Senior Lien Proceeds Par Amount	Federal ⁽¹⁾		Shortfall/ (Excess)	% of Project Cost	State & Local		
			Upfront Transfers %	Transfers \$			Annual Transfers %	Gross Transfers \$ ⁽²⁾	Net Transfers \$ ⁽³⁾
I-70E Express Toll Lanes Scenario 3	293,799,057	293,803,307	0.00%	-	(4,250)	100.00%	0.00%	-	-
I-70 Mountain Corridor - Scenario 3	1,097,606,741	1,097,609,009	0.00%	-	(2,268)	100.00%	0.00%	-	-
I-25 Express Toll Lanes Scenario 1	522,092,110	522,092,920	0.00%	-	(809)	100.00%	0.00%	-	-
I-70 Mountain Corridor - Scenario 3A	1,071,884,739	883,258,993	0.00%	-	188,625,746	82.40%	0.00%	-	-
I-225 Express Toll Lanes	290,149,773	237,603,245	0.00%	-	52,546,529	81.89%	0.00%	-	-
Powers Toll Road Scenario 2	933,255,559	747,768,444	0.00%	-	185,487,115	80.12%	0.00%	-	-
Powers Toll Road Scenario 3	1,210,713,055	879,441,589	0.00%	-	331,271,467	72.64%	0.00%	-	-
I-270 Express Toll Lanes	342,000,226	244,726,949	0.00%	-	97,273,277	71.56%	0.00%	-	-
C-470 Express Toll Lanes Scenario 1A	522,559,134	364,844,370	0.22%	943,015	156,771,749	70.00%	0.00%	-	-
C-470 Express Toll Lanes Scenario 2A	852,240,365	578,498,911	2.58%	18,036,151	255,705,303	70.00%	0.00%	-	-
Powers Toll Road Scenario 4	394,169,608	243,542,868	10.01%	32,365,222	118,261,518	70.00%	0.00%	-	-
I-25 Express Toll Lanes Scenario 2	379,744,624	219,101,717	15.00%	46,724,218	113,918,689	70.00%	0.00%	-	-
Northwest Corridor Scenario 2	526,511,749	297,186,533	16.52%	71,347,792	157,977,424	70.00%	0.00%	-	-
I-70 Mountain Corridor - Scenario 3B	1,054,471,523	593,874,304	16.68%	144,274,552	316,322,667	70.00%	0.00%	-	-
Powers Toll Road Scenario 1	300,882,982	168,314,504	17.14%	42,302,735	90,265,743	70.00%	0.00%	-	-
Denver Area Projects Scenario 2	4,772,150,614	2,581,988,481	19.38%	758,623,843	1,431,538,290	70.00%	0.00%	-	-
I-70E Express Toll Lanes Scenario 2	822,058,672	431,498,113	20.00%	135,053,992	255,506,567	68.92%	10.00%	229,749,539	89,719,374
C-470 Express Toll Lanes Scenario 1	519,767,857	256,798,145	20.00%	85,728,598	177,241,113	65.90%	10.00%	137,088,844	56,055,554
I-70E Express Toll Lanes Scenario 1	942,486,280	465,372,174	20.00%	155,456,018	321,658,088	65.87%	10.00%	250,937,393	97,240,283
C-470 Express Toll Lanes Scenario 2	845,303,390	398,911,804	20.00%	139,815,126	306,576,459	63.73%	10.00%	208,463,594	85,359,182
Denver Area Projects Scenario 1	4,728,017,529	2,558,193,766	10.90%	414,642,845	1,755,180,917	62.88%	1.41%	223,153,273	85,521,879
Northwest Corridor Scenario 1	1,383,715,935	590,950,360	20.00%	230,175,248	562,590,327	59.34%	10.00%	286,314,081	120,009,645
Front Range Toll Road Express Toll Lanes Scenario 2	3,206,570,456	1,291,301,470	20.00%	535,043,465	1,380,224,485	56.96%	10.00%	645,201,105	271,532,386
I-70 Mountain Corridor - Scenario 2	3,973,487,116	1,436,659,073	20.00%	666,449,664	1,870,378,380	52.93%	10.00%	610,475,250	268,215,850
Front Range Toll Road Express Toll Lanes Scenario 1	3,768,725,282	1,321,022,578	20.00%	632,981,471	1,814,721,233	51.85%	10.00%	675,303,371	284,841,439
Banning-Lewis Parkway Toll Road - Scenario 2	918,411,929	214,320,663	20.00%	156,517,093	547,574,173	40.38%	10.00%	134,309,112	54,563,285
Banning-Lewis Parkway Toll Road - Scenario 1	917,972,752	210,660,853	20.00%	156,517,093	550,794,806	40.00%	10.00%	138,215,349	54,660,250
U.S. 36 Express Toll Lanes	1,901,224,249	384,281,903	20.00%	325,258,901	1,191,683,445	37.32%	10.00%	223,153,273	85,521,879
I-70 Mountain Corridor - Scenario 1	4,025,922,619	291,138,085	20.00%	699,744,728	3,035,039,805	24.61%	10.00%	225,471,439	76,317,237
U.S. 287 Corridor Express Toll Lanes	222,180,746	4,270,319	20.00%	38,865,390	179,045,037	19.41%	10.00%	15,587,417	6,651,248

= Denver Regional Area Projects Selected for Cashflow

(1) Upfront transfers include federal moneys available in the form of a one-time, upfront payment
(2) Gross transfers include the total annual state and local contributions over the life of the program
(3) Net transfers are the present value at 5.00% of the gross transfers to the year 2010

The additional federal, state and/or local equity contributions mentioned above were provided to the extent that senior lien bonds from leveraged toll revenues could not fund at least 70 percent of total project costs, subject to certain limitations. First, federal monies could be available in the form of a one-time, upfront payment. This upfront payment is limited to 20 percent of total 2010 project capital costs (exclusive of bond costs). Second, state and local contributions could be available as an annual transfer of up to 10 percent of total gross toll revenues generated for a specific project in a respective year. If less than 70 percent of total project costs remain unfunded after senior lien bond issuance, upfront federal contribution, and state/local annual transfers, project is deemed infeasible and falls below the blackline.

Upon review of Table ES-11, for the individual projects containing multiple possible scenarios, the study team identified one scenario as the “Selected Alternative” for each project based on maximizing financial feasibility. However, the study team continues to present both Scenarios 1 and 2 for the Denver Area Projects as these two scenarios have different financing assumptions. Table ES-12, following, shows those projects selected by the study team, and with CDOT’s review and concurrence, as the Selected Alternatives.

**Table ES-12
Summary of Selected Alternatives**

Project	Total 2010 Project Cost with COI	Senior Lien Proceeds Par Amount	Federal ⁽¹⁾		Shortfall/ (Excess)	% of Project Cost	State & Local		
			Upfront Transfers %	Transfers \$			Annual Transfers %	Gross Transfers \$ ⁽²⁾	Net Transfers \$ ⁽³⁾
I-70E Express Toll Lanes Scenario 3	293,799,057	293,803,307	0.00%	-	(4,250)	100.00%	0.00%	-	-
I-70 Mountain Corridor - Scenario 3	1,097,606,741	1,097,609,009	0.00%	-	(2,268)	100.00%	0.00%	-	-
I-25 Express Toll Lanes Scenario 1	522,092,110	522,092,920	0.00%	-	(809)	100.00%	0.00%	-	-
I-225 Express Toll Lanes	290,149,773	237,603,245	0.00%	-	52,546,529	81.89%	0.00%	-	-
I-270 Express Toll Lanes	342,000,226	244,726,949	0.00%	-	97,273,277	71.56%	0.00%	-	-
C-470 Express Toll Lanes Scenario 2A	852,240,365	578,498,911	2.58%	18,036,151	255,705,303	70.00%	0.00%	-	-
Powers Toll Road Scenario 4	394,169,608	243,542,868	10.01%	32,365,222	118,261,518	70.00%	0.00%	-	-
Northwest Corridor Scenario 2	526,511,749	297,186,533	16.52%	71,347,792	157,977,424	70.00%	0.00%	-	-
Denver Area Projects Scenario 2	4,772,150,614	2,581,988,481	19.38%	758,623,843	1,431,538,290	70.00%	0.00%	-	-
Denver Area Projects Scenario 1	4,728,017,529	2,558,193,766	10.90%	414,642,845	1,755,180,917	62.88%	1.41%	223,153,273	85,521,879
Front Range Toll Road Express Toll Lanes Scenario 1	3,768,725,282	1,321,022,578	20.00%	632,981,471	1,814,721,233	51.85%	10.00%	675,303,371	284,841,439
Banning-Lewis Parkway Toll Road - Scenario 2	918,411,929	214,320,663	20.00%	156,517,093	547,574,173	40.38%	10.00%	134,309,112	54,563,285
U.S. 36 Express Toll Lanes	1,901,224,249	384,281,903	20.00%	325,258,901	1,191,683,445	37.32%	10.00%	223,153,273	85,521,879
U.S. 287 Corridor Express Toll Lanes	222,180,746	4,270,319	20.00%	38,865,390	179,045,037	19.41%	10.00%	15,587,417	6,651,248

= Denver Regional Area Projects Selected for Cashflow

- ⁽¹⁾ Upfront transfers include federal moneys available in the form of a one-time, upfront payment
⁽²⁾ Gross transfers include the total annual state and local contributions over the life of the program
⁽³⁾ Net transfers are the present value at 5.00% of the gross transfers to the year 2010

As represented in Table ES-12, all projects in the Denver Regional Area, except for U.S. 36 Express Toll Lanes, are “financially feasible” on a stand-alone basis when using the 70 percent threshold (under the assumption that additional senior or subordinated debt would fund the remaining 30 percent of project costs).

FEASIBILITY SUMMARY

Based on the results for the Denver Regional Area Projects, approximately \$4.7 billion of project costs can be financed (including costs of issuance) with \$414 million in equity contributions from CDOT under Scenario 1 and with \$759 million in equity contributions under Scenario 2. This means with at least a 13 or 20 percent upfront contribution to projects for Scenarios 1 and 2, respectively, CDOT may complete major corridor improvements. Supplementing the benefits of CDOT’s equity contributions is the option that as a system credit, monies transferred to projects can be paid back to CDOT over time. The study team expects that annual transfers can be paid

back first, then any monies in excess after all payments will be available to repay CDOT for any upfront federal contributions to the system costs.

MARKET SENSITIVITY ANALYSIS

As interest rates fall, each project's ability to leverage debt increases, thereby increasing its feasibility. Conversely, as interest rates rise, each project's ability to leverage debt decreases, which then lowers its feasibility. Clearly, the current interest rate environment affects the overall feasibility of each project. In order to represent the effect of market movements on these analyses, each project was evaluated reflecting an increase in market rates by an addition of 100 basis points (1.0 percent) to current market rates.

SUMMARY

Figures ES-10 through ES-12 present a summary of the financial feasibility analyses previously discussed. Figure ES-10 presents project feasibility based on current market rates. Under this scenario, five projects are considered financially feasible in that 70 percent or more of project costs can be covered solely with toll revenue. Another four projects could be feasible with some federal funding support; the percent of federal funds ranging from 10.0 to 20.0 percent of the 70 percent feasibility threshold.

Figure ES-11 presents a similar summary of project feasibility but assumes an increase of 100 basis points over current market interest rates. This assumption produces similar results, with the exception of the I-270 Express Toll Lane project. With the increase in market interest rates, this project could be feasible if supported with 10.8 percent federal funds. The C-470, Scenario 2A project could also be feasible if supported with 15.2 percent federal funds. The other projects in this category could be feasible with the maximum 20.0 percent federal fund support.

Figure ES-12 provides a side-by-side comparison of both scenarios described above.

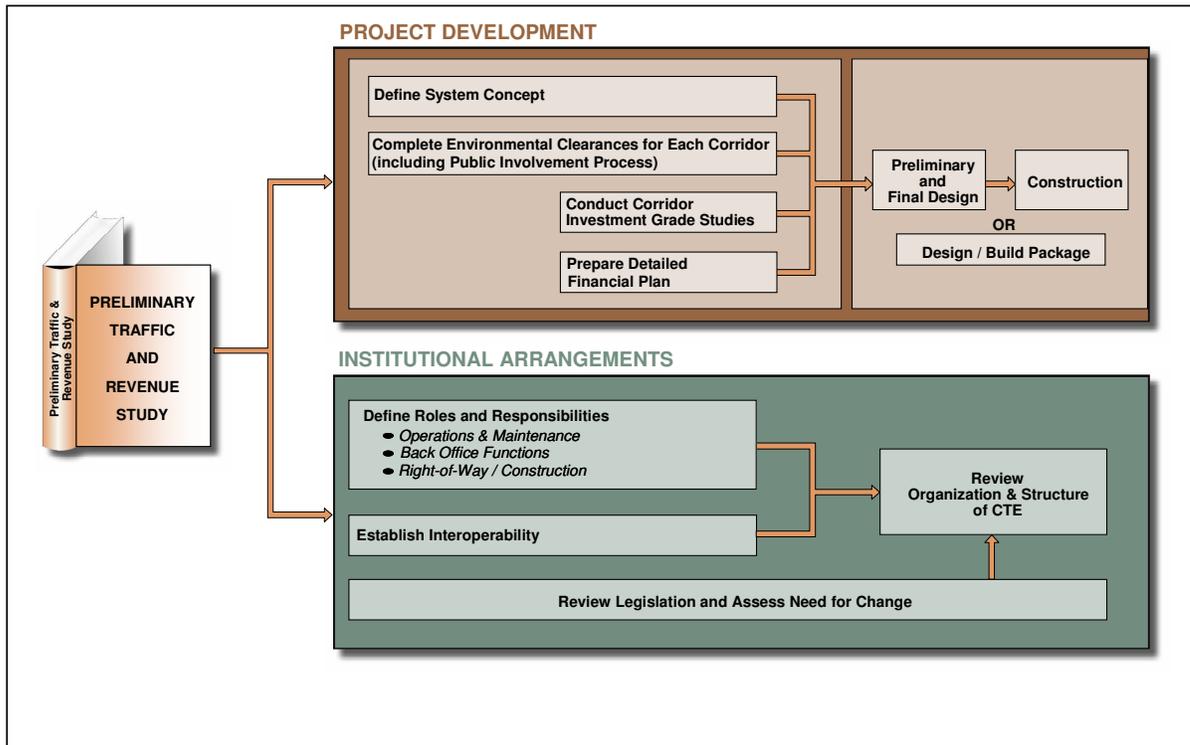
NEXT STEPS TOWARD IMPLEMENTATION

This preliminary traffic and revenue study has tested the basic financial feasibility of utilizing tolls to finance the construction of transportation improvements in a wide range of corridors throughout Colorado. Although the results have indicated that a number of the corridors are potentially viable candidates for tolling, there is much work yet to be done before tolling could be implemented in any corridor. This chapter outlines those future tasks.

As illustrated by Figure ES-13, the next steps fall into two categories:

- Project Development; and
- Institutional Arrangements.

In many cases, work on any number of these tasks could be on-going simultaneously; in some cases, certain tasks need to be completed before another task can even be initiated. These inter-relationships are also briefly described herein.



NEXT STEPS TO IMPLEMENTATION
FIGURE ES-13

PROJECT DEVELOPMENT

This category of future efforts involves elements that lead to the definition, the approval, and the design and construction of a toll facility in any of the corridors. The following are brief synopsis of the key tasks in this category.

- This study has suggested that defining a “system” approach to implementing toll facilities would likely be the most viable approach. System continuity of toll corridors is important, but even more critical is the approach of a financing system. The proper balance of the physical and the finance systems must be carefully considered.

It would likely be most strategic to first construct those projects or portions of projects that were found to have the highest financial feasibility or the ability to be self-supporting. Then, excess revenues generated by these early projects could help to fund those projects that are less viable, but that are still important components of the overall toll system from a system continuity and access standpoint.

If the CTE Board determines that this system approach is appropriate, a strategic definition of the system should be developed before any individual corridor proceeds into implementation.

- Prior to implementation of tolls in any corridor, those improvements will need to obtain environmental clearances through the National Environmental Policy Act process. Most of the corridors either have, or are currently being studied under the NEPA process, and coordination with these efforts should be on-going. These studies are in various stages of completion; some of the on-going studies are programmed to be completed within the next year, while others are at least several years from completion.

If this study indicates that a corridor is expected to be financially feasible for tolling, it is important that the NEPA study include a toll alternative and that it be carried forward as a reasonable alternative unless it has an environmental fatal flaw.

It should be noted, however, that financial feasibility in this study does not imply that tolling will be the chosen alternative through the NEPA process, merely that it is a viable alternative which should be considered. Within the NEPA process, the secondary and indirect impacts of tolling, such as the impacts to alternative routes due to some traffic diversion, should be considered. Environmental impacts should not be significantly different from non-tolled alternatives because open-road tolling with no manual toll collection is being proposed on all projects. Considering these impacts up front in the NEPA documents can help streamline the environmental process and help to minimize the need for an environmental re-evaluation. If a Record of Decision is reached on an alternative that does not include tolls, the environmental clearances would need to be re-evaluated before a toll facility could be pursued.

- Each project would need to be incorporated into Regional and Statewide Planning processes. To that end, the CTE has created an Ad Hoc Committee on Tolling with its planning partners to establish processes for incorporation of possible tolling project into plans and to advise the CTE Board and the Transportation Commission on policy issues related to tolling.
- Each of the second-tier projects determined to be warranted for further consideration of tolling will need to be studied in more detail within an Investment Grade Study. An Investment Grade Study would include further optimization of toll rates, traveler origin-destination surveys, more detailed economic development analysis and further refinement of inputs into traffic models. In addition, more detailed capital and operating and maintenance cost estimates would be developed. The final Investment Grade Study would then be conducted at a level of detail suitable for pursuing actual toll project financing. A study of this nature typically requires 6 to 9 months to complete; ideally it would be programmed to be completed at the same time or before the environmental clearances for a project are obtained.
- A detailed financial plan will need to be prepared for each project. A process for additional funding will need to be determined for those projects that cover less than 100 percent of their capital costs through tolling. The toll revenues could be combined with a number of other funding mechanisms (federal, state or local).

INSTITUTIONAL ARRANGEMENTS

Numerous options are available for the governance of a statewide system of express toll lanes or other toll projects. This group of next steps deals with the need to establish roles and responsibilities for the various entities who would be involved in implementation, the need for any legislative changes, and the organizational or structural needs of CTE in the future.

- Because implementation will likely involve a number of players, it will be important to clearly define the role and responsibilities of each early in the process. The key players will be CDOT, CTE and potentially a wide range of outside service providers (general engineering consultant, traffic and revenue consultant, legal, bond counsel, financial advisor, and bond underwriter). Primary areas in which roles and responsibilities should be defined include:

Operations and Maintenance – CTE will need to coordinate the operation and maintenance process with other entities, such as CDOT, other toll providers or even other private contractors, if they decide to out-source the operation and maintenance of the facility. It is important to note that a high level of maintenance is critical from a sales standpoint. Therefore, the maintenance provider must be able to ensure that the toll facility will always be a “priority” in their business operation.

Back Office Functions – These functions are administrative in nature, with probably the most significant function being that of billing and collections. This could be performed by CTE, could be conducted under an agreement with another toll provider such as the E-470 Authority, or could be out-sourced to a private contractor.

Right-of-Way/Construction – It will be important for CTE and CDOT to come to an agreement on how right-of-way and construction efforts will be handled. It is currently anticipated that CTE would lease right-of-way from CDOT. It is expected that CTE would be responsible for the construction of all toll facilities, while all “free” or general purpose lanes would remain the responsibility of CDOT. These, or other arrangements, should be institutionalized.

- The current legislation which enables the Colorado Tolling Enterprise, mandates that the new toll systems be interoperable with those systems which currently exist – namely E-470 and the Northwest Parkway. Thus, from a user’s standpoint, the system would be “seamless” – one transponder, one bill, etc. Methods to ensure this interoperability should be considered and detailed.
- The existing legislation should be reviewed to ensure that the proposed toll projects meet the guidelines of the legislation. If necessary, appropriate revisions to the legislation should be proposed. If the I-70 west project proceeds, in a scenario in which tolls are applied to all traffic, it may be necessary to obtain a change in legislative authority for CTE. Current enabling legislation does not permit tolling of existing capacity.
- Finally, dependent on the outcome of the legislative review and the other institutional arrangements, the structure and organization of CTE, as currently constituted, should be

examined. Changes should be considered if they are necessary to efficiently manage and operate the toll system.