

CHAPTER 2 SCREENING PROCESS AND ALTERNATIVES CONSIDERED

2.1 INTRODUCTION

The National Environmental Policy Act (NEPA) of 1969 requires that a reasonable range of alternatives be evaluated. This chapter describes the screening process and discusses the alternatives considered and evaluated in the screening process. Each alternative was developed and evaluated in conjunction with an extensive public and agency outreach program, as described in **Chapter 4**.

Alternatives were developed and screened through a three-step screening process in which increasing levels of detail helped distinguish the alternatives and indicate whether they met the purpose and need. Alternatives that did not meet the purpose and need and other implementation objectives derived from the purpose and need were progressively eliminated from further consideration.

Sections 2.2 and 2.3 provide a project history and overview of the alternatives development and screening process. **Section 2.4** discusses alternatives that were carried through the screening process for detailed evaluation in this environmental assessment (EA). **Section 2.5** describes the process through which the Preferred Alternative was identified. Results of this process represent the outcome of the public and agency outreach, in addition to detailed environmental and technical analyses. **Section 2.6** describes alternatives considered during the analysis but which were eliminated from further consideration.

2.2 PROJECT HISTORY AND RELATIONSHIP TO THE PLANNING PROCESS

Highway C-470, in its entirety, has been open to traffic for nearly 15 years, making it one of the region's newest highway facilities operated by the Colorado Department of Transportation (CDOT). The need for a southwest circumferential route for the Denver metropolitan area was first cited in a 1958 report, Transportation in the

Denver Region, prepared by the regional planning agency that preceded the Denver Regional Council of Governments (DRCOG). In 1968, I-470 was authorized, following the Federal Aid Highway Act, which allowed additional circumferential interstate mileage for cities. The environmental process took four years. In 1972, CDOT's predecessor, the Colorado Department of Highways submitted a Final Environmental Impact Statement (EIS) for I-470 to the Federal Highway Administration (FHWA).

In 1975, the FHWA directed the Colorado Department of Highways to revise the I-470 EIS. A 12-member I-470 Ad Hoc Commission was convened to recommend alternative solutions to revising the statement. The following year, the Ad Hoc Commission recommended that I-470 be withdrawn from federal interstate funding, and that a portion of the funding be "transferred" to C-470. On July 28, 1977, Colorado's governor signed an I-470 Withdrawal-Substitution Proposal submitted to the U.S. Secretary of Transportation. Federal approval came on September 30, 1977.

The Centennial Parkway (a.k.a. C-470) FEIS was completed in 1980, with a Record of Decision (ROD) issued in July 1980. Highway construction began in April 1982. But uncertain funding plagued the project over the long term. A C-470 Inter-Chamber Task Force was established to focus on federal funding. Task force members included representatives from Englewood, Littleton, Denver, Golden, and the Lakewood and South Jefferson County Chambers of Commerce. A delegation presented testimony before Congressional committees in April 1982. As a result of this delegation, Congress appropriated to Colorado discretionary funds that were used to complete construction of C-470 from I-25 to I-70.

The initial 11.7 mile stretch of C-470, extending from I-25 to Wadsworth Boulevard was opened

to traffic in December of 1985. On September 4, 1987, the second phase was opened, extending C-470 further west to the Ken Caryl interchange. The northern segment of C-470, extending from the access ramps at U.S. 285 to the I-70 interchange, was opened to traffic November 18, 1988. On October 27, 1990 the segment connecting Ken Caryl Boulevard to the new interchange at US 285 was opened. The total cost for the 26.1 miles of C-470 to date was approximately \$270 million. Ten years later, the C-470 extension from I-70 to 6th Avenue opened on August 31, 2000.

In 2001, CDOT completed the Colorado Value Express Lanes Feasibility Study, which ranked C-470 from Wadsworth Boulevard to I-25 as a good candidate for further high-occupancy vehicle(HOV)/value express lanes consideration. CDOT then received several unsolicited proposals to finance, design, and construct express lanes on C-470. In 2002, CDOT issued the C-470 Corridor Public-Private Initiative Request for Comparable Proposals. From this process, CDOT selected the team of Fluor & Flatiron Infrastructure, Inc. (F&F) as the most responsive proposer. CDOT subsequently entered into a predevelopment agreement with F&F which gives F&F the first right of refusal to perform the design/build of the express lanes should express lanes be selected as the Preferred Alternative in the decision document of this NEPA study. If this occurs, the Colorado Tolling Enterprise (CTE) and F&F would enter into negotiations to execute a design/build contract to build this facility. F&F has been an observer of the Technical Working Group during the study process.

2.2.1 Regional Planning Process

All transportation projects that are implemented within a Metropolitan Planning Organization (MPO) region must be included in that MPO’s fiscally constrained and air quality conforming Regional Transportation Plan (RTP). This ensures that all projects have met air quality conformity requirements and that funding is allocated to projects with the highest regional priority. The FHWA requires that a Preferred Alternative be included in the respective MPO’s fiscally

constrained, air quality-conforming RTP before a decision document selecting the Preferred Alternative may be approved.

To be added to an RTP, traditionally-funded projects in the Denver region must demonstrate the following:

- The project is consistent with the principles in DRCOG’s currently adopted Metro Vision RTP
- Funds are available for implementation
- The project complies with air quality conformity requirements

DRCOG typically updates the RTP every three years, with an amendment process to add other projects to the plan.

Tolling projects will follow a variation of this process. In 2005, the Colorado Legislature passed HB05-1148 that requires the CTE to submit a proposal for all toll projects for review and approval by the MPO located within the highway system. This proposal addresses such items as the operation of the toll highway, technology to be used, project feasibility, project financing, and associated environmental, social, and economic impacts. The CTE Ad Hoc Advisory Committee on Tolling was formed when CDOT, the CTE, the statewide MPOs, Transportation Planning Regions, and other interested parties convened to establish protocol to implement tolls in Colorado and address the requirements of HB05-1148. The process established by this committee, as it pertains to adding a toll project to the RTP is briefly summarized in **Figure 2-1**. Requirements for toll project amendments to the RTP were also established by the committee as outlined in the Toll System/Regional Transportation Plan Amendment Analysis Framework.

Currently, the Metro Vision Plan has identified 20 potential freeway/tollways as part of the “Key Multimodal Corridor Visions” for the

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region. C-470, between I-25 and I-70 is identified as a potential toll corridor.

No funding for the C-470 Corridor is currently identified in DRCOG's 2030 RTP (with the exception of \$20 million for the Santa Fe Drive interchange). As part of the analysis for this EA, it has been determined that toll revenues could fund 100 percent of the EL Alternative, thus its identification as the Preferred Alternative. The Preferred Alternative selection is discussed further in **Section 2.5**. An application to amend DRCOG's RTP to include the EL Alternative and request approval of C-470 as a toll corridor project will be submitted to DRCOG in the Spring of 2006. After the application is accepted, DRCOG would run the air quality conformity analysis, and after approval, the NEPA study would be eligible for a decision document.

2.2.2 Colorado Tolling Enterprise

The CTE was created by CDOT in 2002 based on legislation to fund and operate toll facilities in the state. The formation of the CTE provided the state with an alternative mechanism to address funding shortfalls as traditional funding sources shrink. The non-profit CTE is an extension of CDOT; however, it is operated more as a private business. In accordance with the provisions of the Taxpayer's Bill of Rights (TABOR), the tolling agency was set up as an enterprise to provide it some latitude in business operations, while still being subject to TABOR's limitation on accepting no more than 10 percent of its annual revenue from state and local sources.

Since its formation in 2002, the CTE has been investigating the feasibility of implementing tolling in Colorado and developing its adminis-

trative rules for operation. One of the first initiatives undertaken by the CTE was to identify and evaluate potential tolling corridors around the state. The *CTE Preliminary Traffic and Revenue Study*, (December 2004), screened the statewide candidates from 79 down to 12 corridors, most of which are in the Denver metro area, and all of which are on the Front Range. C-470 is one of the corridors that was listed as potentially feasible. The financial analysis performed for the tolled express lanes in this EA went to a greater level of detail and confirmed that the tolling concept appears to be feasible.

2.2.3 Express Lanes Feasibility Study

The *C-470 Express Lanes Feasibility Study* (June 2005) was conducted concurrently with this EA. The goal of that study was to investigate the potential financial feasibility of constructing tolled express lanes from I-70 to I-25. The study concluded that tolled express lanes could potentially be financially feasible for the section from Kipling Parkway to I-25, thus the tolled express lanes concept was determined to be a viable alternative for consideration in this EA. However, the section from I-70 to Kipling Parkway is not feasible by itself in the 2025 time frame. Several conditions would have to be met before that section would become feasible. If, at some point, tolled express lanes west and north of Kipling Parkway were to be pursued, a separate environmental clearance may be necessary for that section.

Subsequent financial evaluation of the tolled express lanes as part of this EA has determined that the EL Alternative is entirely financially self-supporting, and therefore is eligible for amendment into the fiscally-constrained DRCOG

Figure 2-1
Regional Planning Process For Tolling Projects



RTP and subsequent implementation, as discussed further in **Section 2.5**.

2.2.4 Regional Transportation District

In November 2004, voters in the Regional Transportation District (RTD) approved a comprehensive 12-year transit plan called FasTracks, a tax-based bonding program to provide additional transit service throughout the Denver metro area. FasTracks components include extension of the existing Southeast and Southwest Corridor light rail transit (LRT) lines and enhancing local bus service connections. FasTracks does not include any extension of LRT along the C-470 Corridor between the Southwest and Southeast lines. The relevant FasTracks Plan components are included in the travel demand modeling for all alternatives considered.

The Southwest Corridor LRT extension will extend LRT service south along Santa Fe Drive from the Mineral Station over C-470 and east to Lucent Boulevard, as shown in **Figure 2-2**. *The Southwest Transit Corridor Planning and Conceptual Engineering Study* (December 2002), recommended the extension of light rail from the Mineral Station to an end-of-line station at Lucent Boulevard. This service extension will add another 2.5 miles of track. Over 1,000 additional parking spaces will be part of the new Lucent Boulevard station. Roughly 3,500 new riders are expected at the new Lucent Boulevard station, bringing the total Southwest Corridor ridership to over 20,200 riders per day.

The Southeast Corridor LRT extension includes 2.3 miles of additional LRT service from the planned Lincoln Avenue station to a new station at the planned Lone Tree Town Center. Beyond the new town center, the line will cross over I-25 and continue south to an end-of-line station in the RidgeGate development. This LRT extension will include an additional 2,520 parking spaces between the three planned stations, bringing total ridership for the line to more than 51,000 per day.

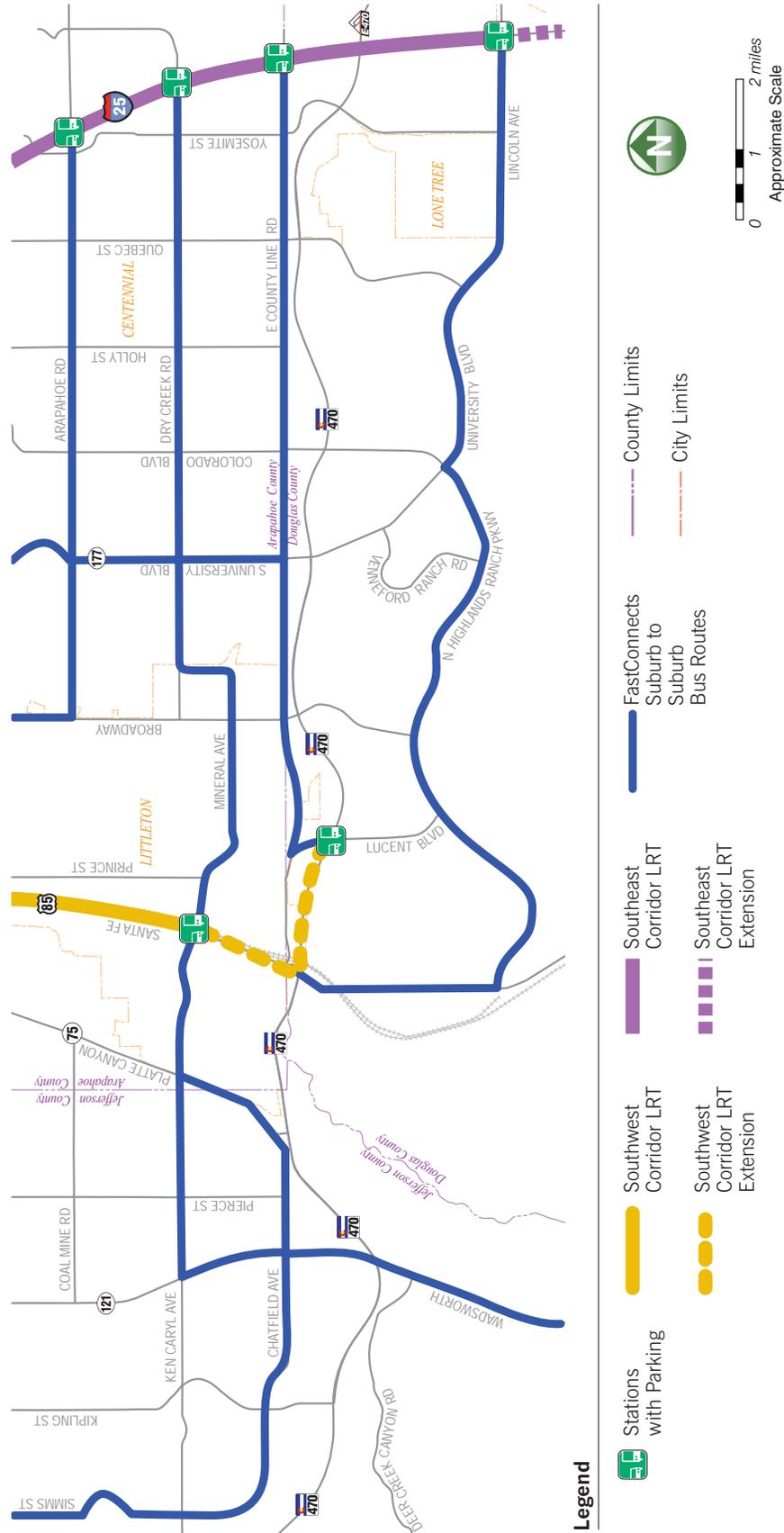
FasTracks also includes a bus component called FastConnects, which consists of local bus service improvements to the future network of suburb-to-suburb bus service links connecting major employment centers and park-n-Rides in the outlying areas. The suburb-to-suburb service is designed around a network of timed connections and transfers. The future expansion of local bus service in the vicinity of the C-470 Corridor includes future bus routes along County Line Road, Dry Creek Road, Arapahoe Road, Ken Caryl Avenue, Lincoln Avenue, and Highlands Ranch Parkway, as shown in **Figure 2-2**.

2.3 ALTERNATIVES DEVELOPMENT AND SCREENING PROCESS

The first step in the screening process was to scope the goals, objectives, issues, and constraints for the C-470 Corridor. Scoping was initiated in April 2003 with outreach meetings to agencies, cities, and counties within the project study area to gain initial understanding of important issues and concerns for the C-470 Corridor. A formal agency scoping meeting was held June 30, 2003. Data collection was completed during the summer of 2003, followed by a scoping meeting with the CDOT Environmental Programs Branch on October 16, 2003. The first round of project public meetings was held October 7, 8, and 9, 2003, at various locations throughout the C-470 Corridor. The input received at these meetings led to the development of the study purpose and need. The purpose and need forms the basis for developing and evaluating a range of alternatives in the screening process.

A performance-based evaluation process was used to assess the nearly 20 different alternatives for mainline C-470 and 14 interchange concepts for the Santa Fe Drive interchange. Each alternative was evaluated using screening criteria derived from the project goals and objectives. These criteria were then used to determine the alternatives that best met the purpose and need. This screening process consisted of three primary steps. Each step involved an increasing level of detail in alternative development. The

**Figure 2-2
Planned FastConnects Bus Service**



Project Management Team consulted the Technical Working Group and Executive Working Group before taking recommendations to the public for their review and comment. Complete disclosure of the public and agency coordination process as part of the alternatives analysis is in **Chapter 4**. The screening process schedule is illustrated in **Figure 2-3**. The alternatives that were considered in the screening process and were carried forward for detailed environmental analysis are described in **Section 2.4**. The alternatives that were considered in the screening process, but were eliminated from consideration are described in **Section 2.6** and summarized in **Table 2-3**. Details of the alternatives development and screening process are in the *Alternatives Screening Report* (March 2005).

2.3.1 Goals, Objectives, and Evaluation Criteria

Input from the scoping process contributed to the development of project goals and objectives, which served as the basis for evaluation criteria used to assess each alternative. Representatives from numerous agencies and public groups were engaged to gather information that was used to develop the purpose and need. Six study goals were developed from the purpose and need. Project goals such as relieving congestion and delay and improving reliability correspond to the project purpose. In addition, project goals such as reasonable and cost-effective implementation, minimizing harmful effects to the environment, creating ease of movement, and improving safety are additional considerations. The goals, objectives, and evaluation criteria for the EA are shown in **Table 2-1**.

After the goals and objectives were defined, screening criteria were developed for each objective to determine how well the alternative could meet each objective. These screening criteria were then used to evaluate each of the alternatives throughout the screening process. The screening process results are shown in **Figure 2-4**.

2.3.2 Initial Screening

After the scoping process was completed, the alternatives development and evaluation process began. An initial range of alternative categories (collectively called the families of solutions) were developed, refined, and evaluated in a fatal flaw analysis. This process evaluated alternatives on the basis of whether they were feasible for C-470. A fatal flaw analysis was used to eliminate families of solutions (general alternative categories) with fundamental safety, mobility, engineering design, or environmental effects, rendering the solutions unreasonable for further consideration. Feasibility was evaluated with respect to meeting the project's purpose and need, compatibility with existing technologies on adjacent corridors, and the ability to design and construct the alternative without significant adverse environmental effects. Families that had fatal flaws or did not address or meet the intent of the project's purpose and need were eliminated from further consideration. The remaining families were carried through to qualitative screening.

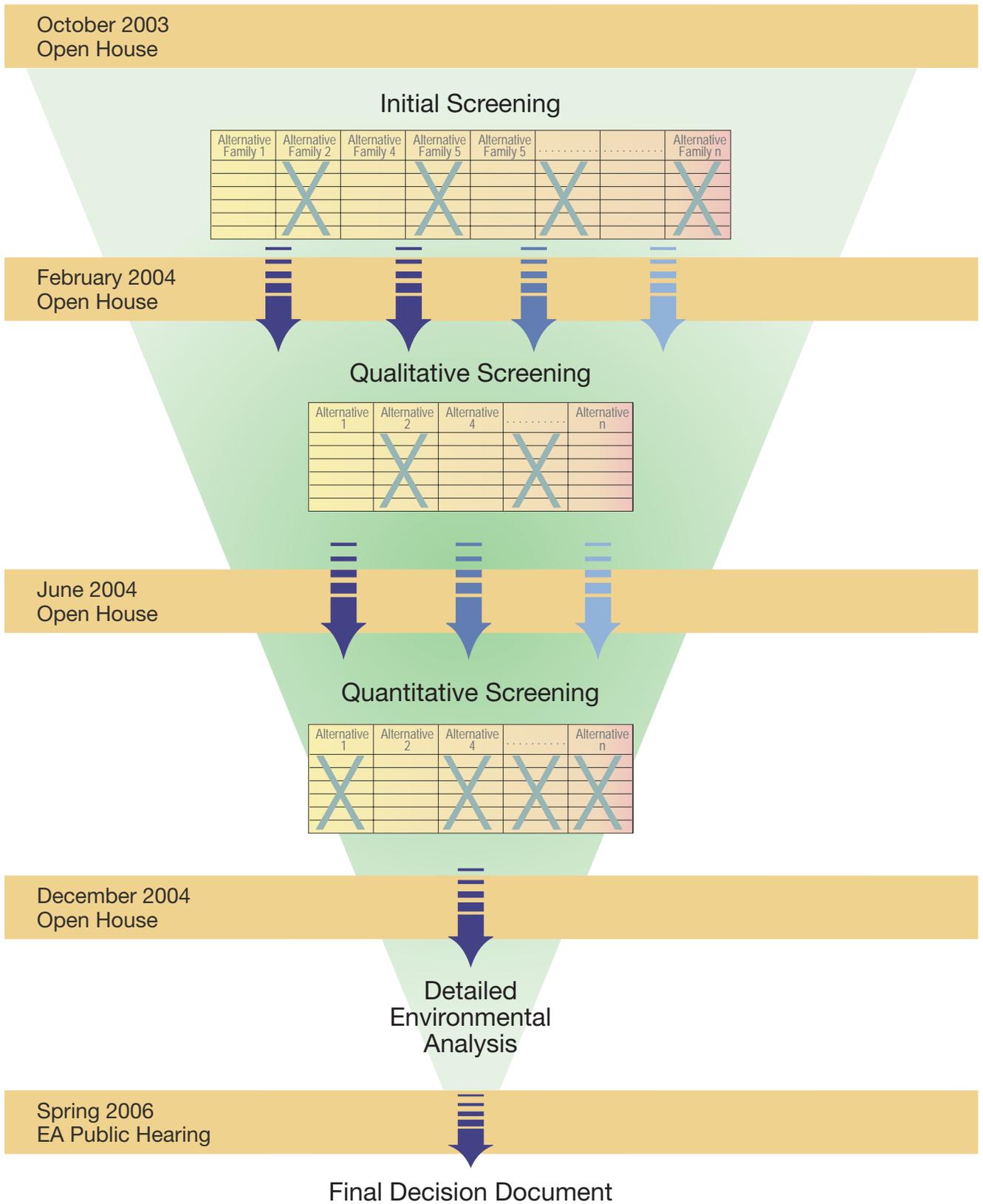
2.3.3 Qualitative Screening

After the initial screening, each family of solutions was broken down into a range of alternatives for qualitative evaluation. Preliminary analysis of each alternative was conducted based on data collected during the scoping process. Traffic modeling, conceptual design, and environmental effects analysis were completed to a sufficient level of detail to provide data to qualitatively assess the differences among alternatives. Alternatives that did not perform well, or those that had substantially more adverse environmental effects to known resources, were eliminated from further consideration. The resulting short list of alternatives was carried forward into quantitative screening.

2.3.4 Quantitative Screening

In this final and most detailed level of analysis, the short-listed alternatives were further developed and refined to avoid and minimize adverse effects. An important element of this refinement process was evaluating and

**Figure 2-3
Screening Process Schedule**



Note: This exhibit displays the concept of eliminating alternatives (indicated by the "x") through the screening process.

**Table 2-1
C-470 Corridor EA Goals, Objectives, and Evaluation Criteria**

	Goals	Objectives	Evaluation Criteria
Project Purpose	Congestion/Delay: Reduce forecasted congestion along the C-470 Corridor	Reduce forecasted congestion on C-470 from Kipling Parkway to I-25	PM peak hour level of service (LOS)
		Provide a reasonable balance between interchange capacity and freeway operations	Intersection LOS
		Minimize delay over a limited timeframe	C-470 travel time
	Reliability: Provide consistent travel times along C-470 between similar time periods	Provide predictable travel times	LOS; actively managed lanes
		Manage capacity	Degree of flexible versus fixed capacity
		Manage accidents (vehicle collisions, sun glare, weather, etc.)	Degree of providing accident management
Provide choices to most users		Number of choices and number of users	
Inform users of system status		Number of intelligent transportation system (ITS) elements included	
Additional Considerations	Implementation: Provide transportation solutions that can be implemented in the short term and that satisfy the project purpose and need	Implement in a timely fashion	Funding availability
		Minimize total project cost	Total project cost
	Ease of Movement: Provide for the ease of movement through and access to the C-470 Corridor	Provide appropriate access to C-470	Number of access points. Provides access for most users
		Provide appropriate access across C-470	Number of crossings
		Integrate multimodal solutions	Availability of transit service and evaluation of effective ridership potential. Coordination with supporting entities such as RTD
		Provide transportation choices to the most users	Mode choice from interchanges on C-470
		Provide a transportation system that is consistent with regional transportation plans	Conformity with regional transportation plans
	Safety: Provide for the safe movement of people and goods	Address pavement condition deficiencies	Will alternative reconstruct deficient pavement areas?
		Address existing mainline safety issues	Does alternative meet project design criteria?
	Environment: Provide transportation solutions that minimize impacts to the natural, cultural, and social environment of the surrounding communities	Minimize impacts to adjacent bicycle/pedestrian trail system	Linear miles of trail relocation
		Minimize noise impacts to the built environment	Number of locations where CDOT noise abatement criteria are exceeded
		Minimize traffic diversion onto local road network	Degree of traffic diversion onto adjacent facilities

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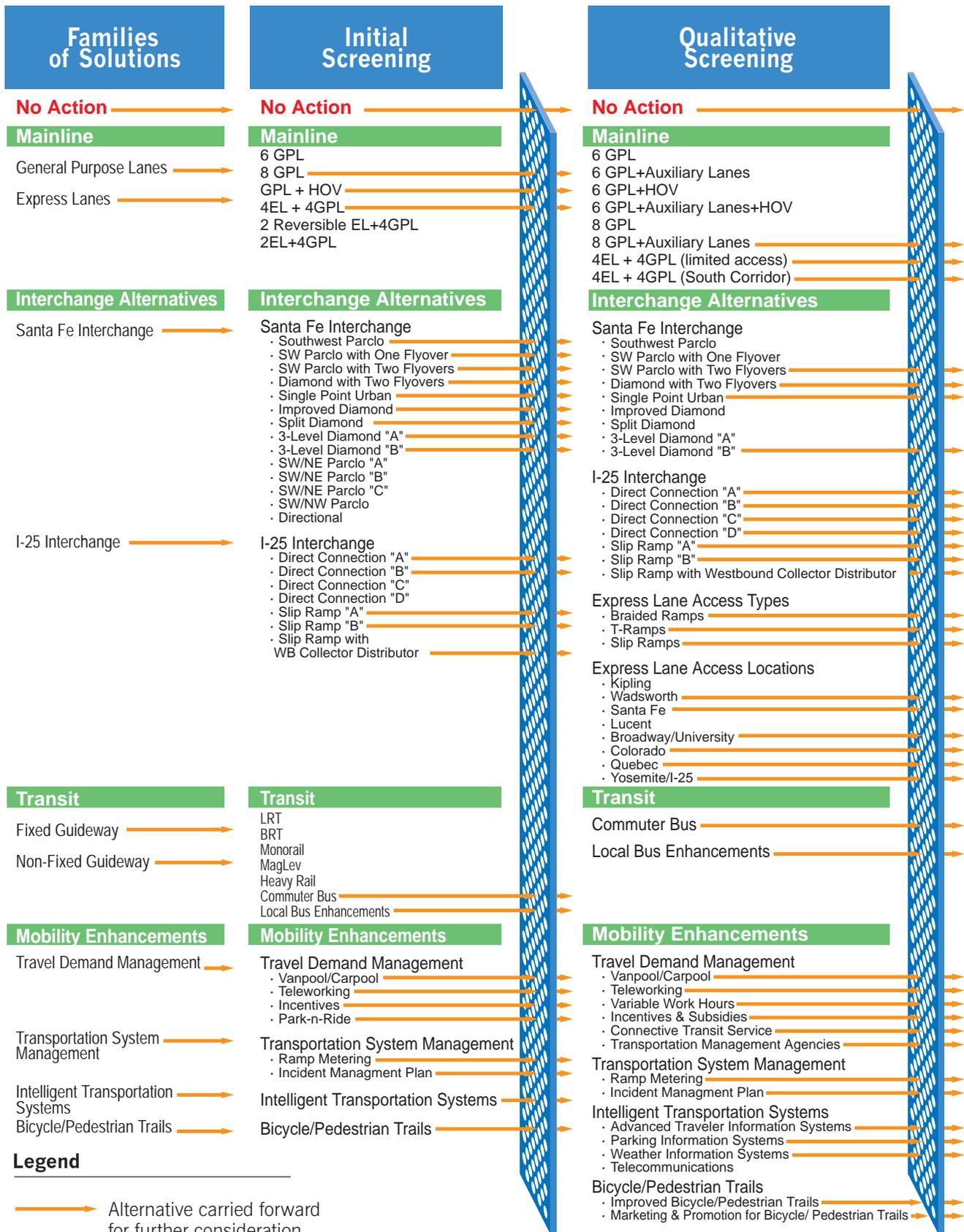
Table 2-1 (Continued)
C-470 Corridor EA Goals, Objectives, and Evaluation Criteria

	Goals	Objectives	Evaluation Criteria
		Maintain compatibility with local land use plans	Is alternative consistency with local land use plans?
		Minimize impacts to wetlands and waters of the U.S.	Acres, intensity, and severity of wetlands and known waters of the U.S. impacted
		Minimize impacts to critical water sources that degrade surface and groundwater quality and quantity	Acres of increased impervious surface area
		Minimize impacts to threatened and endangered species habitat	Acres, intensity, and severity of threatened and endangered species habitat impacted
		Minimize encroachment on hazardous materials sites	Intensity and severity of potential environmental disturbance from hazardous material sites impacted
		Minimize impacts to cultural resources (historic, archaeological, and paleontological)	Number, intensity, and severity of cultural sites impacted
		Minimize impacts to recreation and parkland resources	Acres, intensity, and severity of park or recreation land impacted
		Minimize impacts to riparian/ streamside habitat	Acres, intensity, and severity of riparian habitat impacted
		Minimize visual impacts to neighboring communities	Degree and severity of visual impact
		Minimize air quality impacts	Does alternative cause exceedances of National Ambient Air Quality Standards?
		Enhance opportunity for wildlife movement across C-470	Does alternative provide additional opportunity for wildlife movement?
		Minimize impacts to minority and low-income populations	Are impacts disproportionately high and adverse as compared to other populations along the Corridor?
		Minimize floodplain impacts	Is 100-year floodplain impacted? Amount, severity, and location of impact
		Minimize right-of-way acquisition	Number and severity of parcels impacted; acres of ROW acquired
		Minimize economic impacts to local businesses	Net loss to businesses

Additional Considerations (Continued)

Environment (continued):
 Provide transportation solutions that minimize impacts to the natural, cultural, and social environment of the surrounding communities

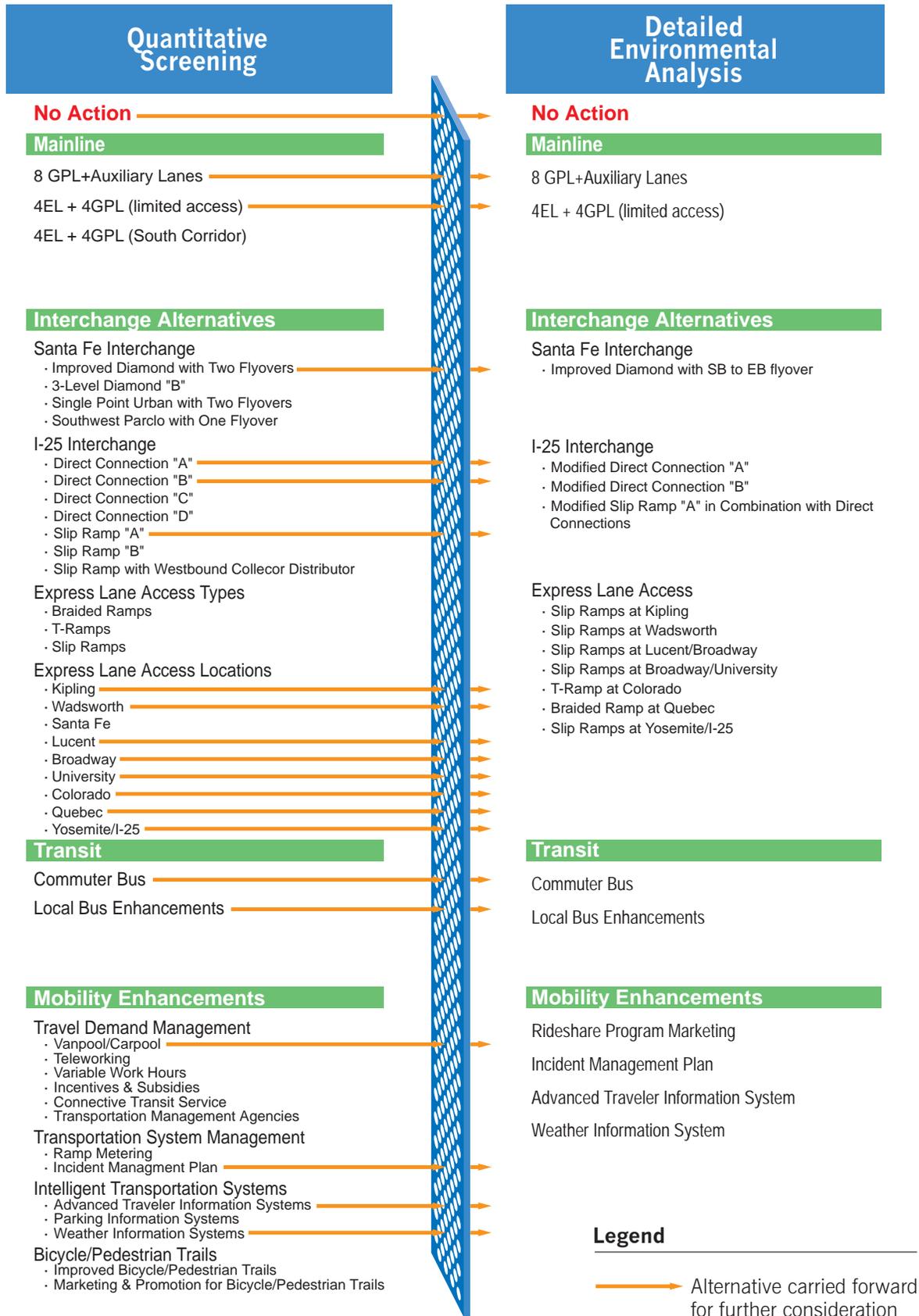
Figure 2-4
Screening Process and Results



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Figure 2-4
Screening Process and Results (continued)



improving traffic operations on the mainline and the arterial street system. At this level, the alternatives were evaluated quantitatively by determining and comparing quantitative values of effects (both positive and negative) for the respective resources. This process resulted in carrying forward two action alternatives and the No-Action Alternative for detailed analysis in the EA.

2.4 ALTERNATIVES CARRIED FORWARD

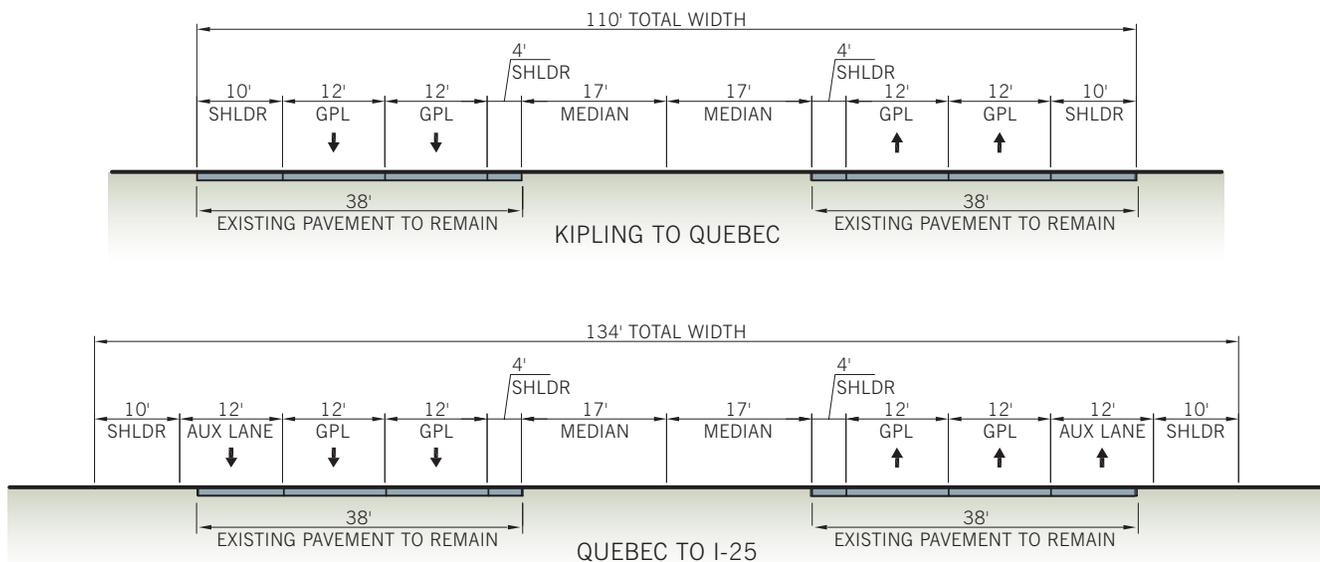
The Eight-Lane General Purpose with Auxiliary Lanes Alternative (hereafter referred to as the GPL Alternative) and the tolled Express Lanes Alternative (hereafter referred to as the EL Alternative) were retained from the screening process and carried forward for detailed environmental analysis. The No-Action Alternative was also retained. While a range of transit alternatives was considered during the screening process, no form of transit service is explicitly included as part of the No-Action, GPL or EL Alternatives. A discussion of opportunities for transit implementation in the C-470 Corridor is contained in Section 2.4.4.

2.4.1 No-Action Alternative

The No-Action Alternative includes taking no action to improve the existing roadway other than performing basic maintenance and/or safety improvements to maintain roadway operation. Travel demand forecasting for the future no action scenario does include likely network improvements off of C-470 that are anticipated to be in place by the design year 2025. These may include local municipal capitol improvements or projects included in the DRCOG 2030 fiscally constrained RTP that may affect traffic levels on C-470. Existing conditions in the C-470 Corridor consist of two general purpose lanes in each direction from Kipling Parkway to I-25. An auxiliary lane in each direction exists between the Quebec Street interchange and the I-25 interchange, serving as continuous acceleration and deceleration lanes.

The existing roadway consists of 12-foot travel lanes, including auxiliary lanes, with inside and outside shoulders, plus a 34-foot median, as shown in Figure 2-5. Paved shoulder widths vary between four and 10 feet. CDOT has recently installed ramp metering at all entrance ramps to C-470 within the project area, with the exception of Kipling Parkway. Ramp metering will continue to be implemented as a mobility enhancement

**Figure 2-5
No-Action Alternative Typical Section**



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