

textures on both sides of the walls running adjacent to their property, with input from the residents. CDOT is also committed to working with the owners and residents of the Wolhurst Community to provide landscaping and improved signage surrounding the entrance to their community.

CDOT will work with adjacent jurisdictions such as Douglas County, Lone Tree, Highlands Ranch, and Littleton to incorporate architectural upgrades to interchanges through the C-470 project area, while maintaining unifying elements with the rest of C-470. Such upgrades will include textured sound walls, landscaping, and bridge identification markings. In some areas, additional community input will be obtained during final design to gain public acceptance of these treatments, such as at the Santa Fe Drive Interchange. To maintain a consistent appearance, an aesthetic treatment plan or menu of design features has been set by CDOT from which stakeholders may select their upgrades. Jurisdictions wishing to upgrade architectural elements would be responsible for funding the construction of their chosen elements.

3.3.15 Utilities

The location of utility lines is an important factor to consider during roadway construction. Major utilities in the project area include water mains 60 inches or greater in diameter; electrical transmission lines; fiber optic lines, including backbone, trunk lines, and fiber considered critical to national security; and large sanitary sewer lines 60 inches or greater in diameter.

3.3.15.1 Affected Environment

Most utility infrastructure is privately owned by corporations providing telephone, communication, electrical, and gas service to communities in the C-470 project area. Local government typically provides public water and sanitary service to its respective jurisdictions. Above ground and overhead infrastructure is present throughout the project area, located within and outside the existing ROW. All major utilities in

the project area were inventoried and included in the utility impact analysis.

3.3.15.2 Environmental Consequences No-Action Alternative

No effects to utilities would occur under the No-Action Alternative.

General Purpose Lanes Alternative

Table 3-41 lists potential effects to utilities from the two action alternatives. Additional detail for each utility and the respective effects can be found in the *Utilities Technical Report* (March 2005).

Express Lanes Alternative (Preferred Alternative)

Potential effects to utilities from the EL Alternative are generally the same as those for the GPL Alternative, except in areas where the EL Alternative is slightly wider between Quebec Street and Colorado Boulevard, where additional telephone, communication, and water utilities may be affected.

3.3.15.3 Mitigation

When a privately owned utility is located within public ROW, the owner company is responsible for relocating the utility to accommodate a public improvement project. This usually applies to telephone and communications and electrical and gas utility infrastructure. Where ROW acquisition is required, or when a publicly held utility must be relocated to accommodate a highway project, it is generally the project's responsibility to fund the related construction for relocation. During excavation for buried utility relocation, precautions would be taken such that soil disturbance would not result in release of potential airborne asbestos.

Utility relocation requirements would be defined during final design. In most cases, private utility companies do not know the depths of their facilities. A method known as potholing would be used to determine the exact depth of utility infrastructure. Potholing uses a machine that is equipped with a high-pressure sprayer and a

Table 3-41
Effects to Utilities

Utility Owner	Type	Buried or Overhead	Utility Location	Potential Effect
City of Englewood	Ditch (City Ditch)	Buried	Crosses C-470 at Santa Fe Dr west ramps	Santa Fe Drive overpass support/C-470 roadway/ ROW
Comcast	Fiber optic cable	Overhead	Crosses C-470 at Garrison Street, on Xcel Energy poles	Possible pole relocation(s)
	Fiber optic cable	Buried	Crosses C-470 at Santa Fe Dr, west ramps	Santa Fe Drive overpass support/ C-470 roadway/ ROW
	Fiber optic cable	Buried	North-south in southbound lanes of Santa Fe Drive; crosses C-470 at Santa Fe Dr, attached to bridge	Santa Fe Drive overpass modifications
	Fiber optic cable	Buried	Parallels C-470 on south side within proposed footprint, on Xcel Energy poles	C-470 roadway/ ROW
	Fiber optic cable	Overhead	Crosses C-470 at High Line Canal tunnel	C-470 roadway/ ROW
	Fiber optic cable	Buried	Crosses C-470 between High Line Canal and Lucent Blvd	C-470 roadway/ ROW
	Fiber optic cable	Buried	Crosses C-470 under Broadway	C-470 overpass support
	Fiber optic cable	Buried	Crosses C-470 under University Blvd	C-470 overpass support
	Two fiber optic cable runs	Buried	Crosses C-470 under Yosemite St	C-470 overpass support
Denver Water	90" raw water main	Buried	Crosses C-470 at Wadsworth Blvd, east ramps	C-470 roadway/ ROW
	Ditch (High Line Canal)	n/a	Crosses C-470 between Santa Fe Dr and Lucent Blvd	C-470 roadway/ ROW

Table 3-41
Effects to Utilities (continued)

Utility Owner	Type	Buried or Overhead	Utility Location	Potential Effect
Denver Water	108" water main	Buried	Crosses C-470 at University Blvd, west ramps; parallels north ROW to east ramps	C-470 roadway/ ROW
	60" water main	Buried	Crosses C-470 at University Blvd. under east ramps; parallels south ROW to Colorado Blvd	C-470 roadway/ ROW
	60" water main	Buried	Parallels C-470 on south side entering and exiting footprint in several locations from east of University Blvd to Quebec Street	C-470 roadway/ ROW
	60" water main	Buried	Crosses C-470 at Quebec Street, west ramps	C-470 roadway/ ROW
Lockheed Martin	Critical fiber optics	Buried	Parallels south C-470 within areas of proposed footprint between Wadsworth Blvd and Platte Canyon Rd	C-470 roadway/ ROW
	Critical fiber optics	Buried	Parallels south C-470 ROW between Platte Canyon Rd and Santa Fe Dr	C-470 roadway/ ROW
	Critical fiber optics	Buried	Crosses C-470 at Santa Fe Dr, attached to bridge	Santa Fe overpass modifications
MCI	Fiber optic communications	Buried	Crosses C-470 on BNSF bridge (easternmost track)	BNSF bridge modifications
Northern Douglas County Water and Sanitation District	Sanitary sewer	Buried	Barely enters footprint on south side, at Dry Creek; golf course	C-470 roadway/ ROW
Qwest Local Area Network	Fiber optic communications	Buried	Crosses C-470 at Ute Ave	C-470 roadway/ ROW
	Fiber optic communications	Buried	Crosses C-470 at Quebec St	Quebec Street overpass modification/C-470 roadway/ ROW

Table 3-41
Effects to Utilities (continued)

Utility Owner	Type	Buried or Overhead	Utility Location	Potential Effect
Qwest Communications	Critical fiber optics	Buried	Crosses C-470 on BNSF bridge (easternmost track)	BNSF bridge modifications
	Critical fiber optics	Buried	Crosses C-470 on west side of Lucent Blvd overpass	Lucent Blvd overpass modifications/ C-470 roadway/ROW
Touch America	Fiber optic communications	Buried	Crosses C-470 in bridge at Colorado Blvd	Colorado overpass modifications
US Sprint	Fiber optic communications	Buried	Crosses C-470 on UPRR bridge (western most track)	UPRR bridge modifications
Xcel	HP gas	Buried	Parallels north C-470 ROW and crosses C-470 at gravel pit between Platte Canyon Rd and Santa Fe Dr; HP line continues east approximately 500 feet beyond crossing	C-470 roadway/ ROW
	Electric transmission	Overhead	Crosses C-470 at Platte River Greenway	Possible pole relocation(s)
	HP gas	Buried	North-south on west side of Santa Fe Dr north of C-470, in southbound lanes south of C-470, crosses C-470 at Santa Fe Dr, west ramps	Santa Fe Drive overpass support/ C-470 roadway/ ROW
	Electric transmission	Overhead	Crosses C-470 west of Broadway	Possible pole relocation(s)
	Electric transmission	Overhead	Crosses C-470 at Quebec St	Possible pole relocation(s)
XO Communications	Fiber optic communications	Buried	Crosses C-470 under Yosemite St	C-470 overpass support

vacuum hose. The sprayer is used to loosen soil from around utilities, and the vacuum hose carries away the loosened material. This is an effective, low-risk method for finding buried utilities.

3.3.16 C-470 Trail

This section discusses the character of the C-470 trail and the role it plays in a multi-modal transportation system, the effects of the alternatives on the trail, and mitigation for these effects.

3.3.16.1 Affected Environment

The C-470 trail is a 10-foot wide concrete trail which runs the entire 26-mile length of C-470 from I-70 to I-25 and is part of a longer trail system that extends into Golden on the west and continues along E-470 on the east. The trail connects to several other trails and bikeways to produce a network of multi-modal transportation access for many types of users, primarily bicycles. It was constructed by CDOT along with C-470 as the backbone of a multi-modal transportation facility. As a component element in a multi-modal transportation system, the trail is not a protected resource under Section 4(f).

Appendix D shows the location of the trail within the EA limits. It is generally within the existing ROW; however, there are two locations where the trail is outside the CDOT ROW. Where C-470 crosses Chatfield State Park, CDOT has been granted an easement for the roadway on USACE property. The trail through this area meanders in and out of the CDOT easement. Although this section of the trail is on USACE property and within Chatfield State Park, CDOT funded and constructed this section of trail and Chatfield State Park maintains it.

East of Santa Fe Drive, the trail diverts from C-470 and follows the High Line Canal easterly to about Broadway, at which point it returns to the CDOT ROW where it continues to I-25 and beyond. The C-470 trail originally followed the High Line Canal trail in order to avoid building a redundant parallel trail and thus save cost.

The trail profile generally follows the same profile as the roadway, with some variation due to horizontal alignment differences. Most of the arterial street crossings are accomplished with at-grade crossings, except at Wadsworth Boulevard and Lucent Boulevard, where the trail passes under the roadway. Several sections of the trail have poor pavement conditions, with cracking or faulting pavement.

3.3.16.2 Environmental Consequences No-Action Alternative

The No-Action Alternative has no affect on the C-470 trail. At-grade crossings of arterial streets would remain. Existing surface condition problems would also persist.

General Purpose Lanes Alternative

The GPL Alternative would require that 7.5 miles of trail be reconstructed a sufficient distance outward from the new roadway to allow for the widening. The distance the trail would be relocated outward is generally on the order of 45 to 50 feet, but the actual range of displacement varies from 0 feet to 167 feet. Additional ROW acquisition would be required for portions of the trail relocation. **Appendix D** shows the location of the relocated trail relative to the existing and proposed ROW.

The trail would be similar in character to the existing trail, but would be closer to adjacent private property and improvements by the distances noted above. Other than the lateral displacement described above, the general location of the trail would remain the same, as would the profile. The reconstruction of the trail would provide for a new, improved wearing surface.

Express Lanes Alternative (Preferred Alternative)

The EL Alternative would have similar effects as the GPL Alternative, except that 8.1 miles of trail would need to be reconstructed.

3.3.16.3 Mitigation

No-Action Alternative

The No-Action Alternative would not reconstruct any of the existing trail, so all existing trail surface deficiencies and at-grade street crossings would remain.

General Purpose Lanes Alternative

The GPL Alternative would relocate and reconstruct 7.5 miles of the trail with a new surface, correcting the existing surface deficiencies. Three grade separated trail crossings would be constructed to alleviate bicycle/pedestrian interactions with traffic at grade-crossings of arterial streets that intersect C-470. These new grade separations are being proposed at Santa Fe Drive, Colorado Boulevard, and Quebec Street.

- Construction of grade separations with the new Santa Fe Drive interchange at all conflict points, would eliminate the existing at-grade street crossing
- Relocation of the trail under the Colorado Boulevard overpass would eliminate the existing at-grade street crossing
- Relocation of the trail under the Quebec Street overpass and construction of grade separations at ramp conflict points would replace the existing at-grade street crossing

Reconstruction of the trail and proximity to roadway construction would require that detours be provided to ensure uninterrupted service to trail users. CDOT would coordinate with trail user groups to keep them informed of construction activity and detour routes as it relates to the C-470 trail.

Express Lanes Alternative (Preferred Alternative)

The EL Alternative would have similar mitigation as the GPL Alternative, with 8.1 miles of new trail surface. Three grade separated trail crossings would be constructed to alleviate bicycle/pedestrian interactions with traffic at

grade-crossings of arterial streets that intersect C-470. These new grade separations would be located at Santa Fe Drive, Colorado Boulevard, and Quebec Street, consistent with the mitigation proposal for the GPL Alternative. Detours would be provided to ensure uninterrupted service to trail users. CDOT would coordinate with trail user groups to keep them informed of construction activity and detour routes as it relates to the C-470 trail.

3.3.17 Construction

Construction-related effects relate to maintenance of traffic during construction, the potential for diversion of traffic onto the arterial street network, relocation of access, temporary construction easements, water quality, noise, air quality, availability of construction materials, and vibration due to construction activities.

3.3.17.1 Affected Environment

Additional highway widening and reconstruction is the major component of the GPL and EL Alternatives presented for C-470. Heavy equipment operation and earth moving machinery creates exhaust emissions, dust, water runoff, traffic congestion, and undesirable noise and vibration. Businesses located near the interchanges along C-470 may be affected by potential access restrictions. CDOT implements a communications program with affected businesses and the public to keep them informed of construction schedules.

While detailed construction phasing plans would not be completed until final design, a phasing scheme was developed as part of the conceptual design for this EA that provides a qualitative assessment of potential effects that might be produced as a result of implementing one of the action alternatives. Because the GPL and EL Alternatives are similar with regard to typical section and width, the same construction phasing scheme is applicable to both alternatives.

Construction Phasing

It is anticipated that the mainline portion of either action alternative would be constructed in three phases. The Santa Fe Drive and I-25 interchanges would require more detailed construction phasing.

A three-phase construction sequence would involve shifting traffic on the existing pavement toward the outside while building a portion of the median area. The second phase would shift traffic to the partially constructed median and construct the outside portion. The final phase would shift traffic to the outside and complete the interior sections.

Final construction phasing and traffic control requirements would be determined during the final design process. To minimize traffic delays and congestion during the construction of either alternative, the following steps would be taken:

- Develop detailed construction phasing and traffic control plans
- Maintain two 12-foot travel lanes in each direction
- Maintain a minimum of two-foot shoulders throughout the construction zone
- Provide emergency pullout areas when shoulders are less than eight feet wide
- Provide a construction zone assistance vehicle to assist motorists with vehicular problems
- Use signing to announce and advertise timing of road closures
- Maintain existing exits and entrances to and from C-470 at all times during morning and evening peak hour traffic

3.3.17.2 Environmental Consequences No-Action Alternative

The No-Action Alternative would have no construction effects.

General Purpose Lanes Alternative TRAFFIC DIVERSION ONTO ARTERIAL STREET NETWORK.

A qualitative assessment of potential effects was performed to determine areas where traffic diversion may occur during construction. Congestion on C-470 would increase during construction due to slower design speeds and narrower shoulders. As a result, traffic would divert from C-470 to alternative routes to avoid this congestion. Any intersections that are currently at or over capacity and operating at poor levels of service would get worse during construction activity.

The following intersection locations would likely see an increase in traffic during construction, and due to their limited reserve capacity, may present some operational problems:

- Lucent Boulevard/County Line Road
- Broadway/County Line Road
- University Boulevard/County Line Road
- Colorado Boulevard/County Line Road
- Quebec Street/County Line Road
- Yosemite Street/County Line Road
- University Boulevard/Dry Creek Road
- Colorado Boulevard/Dry Creek Road



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RELOCATION OF RESIDENTIAL OR BUSINESS ACCESSES. Reconstruction of the Santa Fe Drive interchange and associated work on Santa Fe Drive may require the temporary closure of some access points for reconstruction. A closure without provisions for temporary access would have adverse social and economic effects on the users of these accesses.

TEMPORARY CONSTRUCTION EASEMENTS. Although all permanent improvements would be located on public ROW, often times there is a need to gain access to adjacent property to construct the improvements that are very close to the ROW interface, or which connect to some other improvement on the adjacent property. Temporary easements are obtained to allow access onto the adjacent property for a short duration of time during construction of the improvements. The land so acquired is minimally disturbed and is returned to its original condition prior to the lease termination.

The level of design undertaken for an EA such as the C-470 Corridor EA is usually not detailed enough to identify all the potential temporary easements that might be necessary to construct a project, so it is not possible to identify all the potential temporary easements in this EA document. However, the following temporary easement has been identified.

Construction of the new Santa Fe Drive interchange requires that a retaining wall be built very close to the existing USACE ROW in the southwest quadrant of the interchange. Due to the preliminary nature of ROW information in the EA, the actual location of ROW is subject to change. Based on the best information to date, it is believed that the finished wall will be entirely contained within CDOT's ROW and/or USACE Easement. However, if the ROW location is closer to the wall than expected, construction of the wall

may require temporary use of a small portion of USACE property.

Should a temporary easement be required to construct the wall, it would not constitute a 4(f) use in accordance with 23 CFR 771.135, which states, "A temporary occupancy of land is so minimal that it does not constitute a use within the meaning of section 4(f) when the following conditions are satisfied: (i) Duration must be temporary, i.e., less than the time needed for construction of the project, and there should be no change in ownership of the land; (ii) Scope of the work must be minor, i.e., both the nature and the magnitude of the changes to the section 4(f) resource are minimal; (iii) There are no anticipated permanent adverse physical impacts, nor will there be interference with the activities or purpose of the resource, on either a temporary or permanent basis; (iv) The land being used must be fully restored, i.e., the resource must be returned to a condition which is at least as good as that which existed prior to the project; and (v) There must be documented agreement of the appropriate Federal, State, or local officials having jurisdiction over the resource regarding the above conditions."

If such a temporary easement should be needed, CDOT would ensure that the above conditions would be met.

The easement would be used to gain access to the work zone in front of the retaining wall, and for continuous access along the retaining wall for the purpose of stockpiling and accessing materials needed for construction of the wall. The land acquired by this temporary easement would be fenced off from the remainder of Chatfield State Park land and would not be available for use. Construction machinery traveling over this land would cause some minor disturbance of the soil and existing grass.

WATER QUALITY. Due to the nature of disturbing the existing soil for construction purposes, storm runoff has the potential to create erosion and degradation of water quality if proper BMPs are not employed and maintained.

NOISE. Short-term noise may be generated by stationary and mobile construction equipment. Elevated noise levels would be expected to occur in proximity to noise receptors during both day and night. Construction of the project will generate noise from diesel-powered earth moving equipment such as dump trucks and bulldozers, back-up alarms on certain equipment, compressors, and pile drivers (near bridge abutments and retaining walls, if necessary). Construction noise at off-site receptor locations would be dependent on the loudest one or two pieces of equipment operating at any given time. Noise levels from diesel-powered equipment range from 80 to 95 dBA at a distance of 50 feet. Equipment such as rock drills and pile drivers would generate even louder noise levels.

AIR QUALITY. Airborne dust caused by vehicles on dirt and paved roads would be the primary source of PM₁₀, but dust created from active construction sites can also be a main contributor. Increased PM₁₀ concentrations due to construction would be temporary. Furthermore, these emissions from numerous mobile and stationary sources are considered during the formulation of the SIP, and therefore have already been accounted for in the air quality modeling for this project.

CONSTRUCTION MATERIAL AVAILABILITY. The availability of construction material would be the same for the EL Alternative as for the GPL Alternative.

VIBRATION. The EL Alternative vibration effects from construction activity would be the same as the GPL Alternative.

C-470 TRAIL. Reconstruction of the trail and proximity to roadway construction would require that detours be provided to ensure uninterrupted service to trail users.

**Express Lanes Alternative
(Preferred Alternative)**

TRAFFIC DIVERSION ONTO ARTERIAL STREET NETWORK. The EL Alternative would have the same affect on the arterial street network as the GPL Alternative, and the same intersections identified for the GPL Alternative would apply to the EL Alternative as well.

RELOCATION OF RESIDENTIAL OR BUSINESS ACCESSES. Closure, temporary access, and restrictions are the same as for the GPL Alternative.

WATER QUALITY. As with the GPL Alternative, storm runoff has the potential to create erosion and degradation of water quality if proper BMPs are not employed.

TEMPORARY CONSTRUCTION EASEMENTS. The EL Alternative would have the same need for temporary construction easements as the GPL Alternative, and would have the same effects as the GPL Alternative.

NOISE. Temporary noise effects generated by stationary and mobile construction equipment are the same as the GPL Alternative.

AIR QUALITY. The EL Alternative will result in similar temporary PM₁₀ air emissions as the GPL Alternative.

CONSTRUCTION MATERIAL AVAILABILITY. Because the study is located in the Denver area, construction materials would be

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plentiful and readily available. Several aggregate quarries are located within 20 miles of the study site. Highway construction would also be able to take advantage of recycled and reusable materials in the urban area, to preserve available and ultimately limited natural resources for other uses.

VIBRATION. Vibration will occur from certain operations, particularly pile driving for substructure units, and also from general construction equipment usage in proximity to sensitive receptors.

C-470 TRAIL. EL Alternative effects would be the same as the GPL Alternative.

3.3.17.3 Mitigation

Mitigation for both the GPL and EL Alternatives would be similar. CDOT is committed to sustainable construction practice, such as reusing materials and recycling, waste minimization, water and energy conservation, and other measures which can minimize the cumulative effects of the project through resource conservation.

Traffic Diversion onto Arterial Street Network

Mitigation for the projected congestion increase at adjacent arterial intersections would include minor capacity and operational improvements at select locations within the project area.

Improvements would be made at locations that provide the greatest congestion relief for the most users.

These improvements are generally considered to be minimal-action improvements, such as restriping to extend turn bay storage, or to extend acceleration/deceleration lanes inside existing ROW without incurring any direct environmental effects, as shown in **Appendix D**, pages D-55 through D-61. Some improvements would be performed prior to implementing traffic control plans on C-470 that would divert traffic onto the arterial street system. The timing of these improvements would be determined during final design.

The recommended intersection improvements are listed here. These actions would improve traffic operations on the arterial street network during construction with minimal effort and expense.

- Lucent Boulevard/County Line Road – restripe to add an additional northbound to westbound left turn lane
- Broadway/County Line Road – extend the existing eastbound to southbound right turn lane to a length of 375 feet; extend the existing eastbound to northbound left turn lane to a length of approximately 450 feet; add a 225-foot southbound to westbound right turn lane
- University Boulevard/County Line Road – extend the existing outside westbound to southbound left turn lane to approximately 375 feet; extend the existing northbound to westbound left turn lane about 200 feet, to provide approximately 500 feet of storage
- Colorado Boulevard/County Line Road – restripe the west leg of County Line Road to provide an additional eastbound to northbound left turn lane which could provide approximately 800 feet of storage; extend the existing southbound to eastbound left turn lane to approximately 400 feet; extend the existing northbound to westbound left turn lane to approximately 300 feet
- Colorado Boulevard/Dry Creek Road – restripe the west leg of County Line Road to provide approximately 600 feet of storage for the eastbound to northbound left turn lane; restripe the south leg of Colorado Boulevard to provide additional storage for the northbound to westbound left turn lane
- Quebec Street/County Line Road – restripe the north leg of Quebec Street to provide approximately 250 feet of storage for the

1 outside southbound to eastbound left turn
2 lane

- 3
- 4 ■ Yosemite Street/County Line Road
- 5 – restripe the west leg of County Line
- 6 Road to provide approximately 425 feet
- 7 of storage for the outside eastbound to
- 8 northbound left turn lane; restripe the
- 9 south leg of Yosemite Street to provide
- 10 approximately 300 feet of storage for the
- 11 outside northbound to westbound left turn
- 12 lane storage

13

14 In addition to the minor capacity-related
15 improvements described above, CDOT would
16 investigate the practicality of requiring the
17 contractor to:

- 18
- 19 ■ Develop a detailed construction phasing
- 20 plan and an associated traffic control plan
- 21 for all phases of work, taking into consid-
- 22 eration the adjacent local arterial street
- 23 system in addition to the C-470 mainline
- 24
- 25 ■ Ensure that emergency vehicle access will
- 26 be maintained through all construction
- 27 phases
- 28
- 29 ■ Perform traffic analysis to predict extent of
- 30 traffic diversion from C-470 onto arterial
- 31 street system, identify any potential traffic
- 32 congestion areas on the arterial street
- 33 system, and implement any appropriate
- 34 transportation system management (TSM)
- 35 improvements. These TSM strategies
- 36 could consist of restriping turn bays or
- 37 acceleration/deceleration lanes to improve
- 38 intersection operations; retiming signals to
- 39 change phasing plans or timing to improve
- 40 operations; or other minor capacity
- 41 improvements or management strategies to
- 42 reduce congestion
- 43
- 44 ■ Prohibit long-term closures (beyond a
- 45 typical nighttime or extended weekend
- 46 closure) of any C-470 interchanges
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- 51 ■ Develop a thorough and detailed detour
52 signing plan for the arterial street system
53
- 54 ■ Consider restricting the contractor from
55 working on adjacent interchanges concur-
56 rently for work that affects traffic opera-
57 tions.
58
- 59 ■ Restrict contractor from using any daytime
60 closures. Only nighttime closures would be
61 allowed
62
- 63 ■ Follow CDOT Region 6 Lane Closure
64 Strategy for all lane closure times
65

66 **Relocation of Residential or Business**
67 **Accesses**

68 Restrictions will be placed on the contractor to
69 provide a temporary or alternative access during
70 construction, which will minimize effects and
71 inconvenience to the users.
72

73 **Temporary Construction Easements**

74 Property owners from whom temporary
75 construction easements are obtained would be
76 compensated for use of the property, at a price
77 which is mutually agreeable to CDOT and the
78 owner. After completion of use and prior to
79 termination of the lease, the land would be
80 regraded and reseeded as necessary to restore it
81 to its original condition prior to construction.
82

83 **Water Quality**

84 The following temporary BMPs would be used
85 during construction of either action alternative to
86 prevent erosion, sediment, and nutrient loading
87 in the watershed:
88

- 89 ■ Install perimeter erosion control measures
90 prior to grading
91
- 92 ■ Follow the spill prevention and
93 containment procedures outlined in the
94 spill prevention plan
95
- 96 ■ Implement stabilization BMPs such as
97 mulching, temporary seeding, and erosion
98 control blankets
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- 1 ■ Inspect erosion and sediment control 51
2 measures at least every 14 days and after 52
3 every major rain or snow event 53
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 - 5 ■ Avoid ground-disturbing activities or work 54
6 during periods of heavy precipitation 55
7 56
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 - 9 ■ Till soils that have been compacted by 57
10 heavy construction equipment to allow for 58
11 quicker establishment of grass reseeding 59
12
 - 13 ■ Sequence clearing so that entire site is 60
14 not disturbed; stabilization of a cleared 61
15 site would occur as soon as activity is 62
16 completed 63
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 - 18 ■ Utilize a central staging area for all 64
19 equipment and disposal of waste material; 65
20 this staging area will not be located near 66
21 streams or wetland areas 67
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 - 23 ■ Manage waste stockpiles of concrete, solid, 68
24 sanitary/septic materials, liquids, and 69
25 hazardous materials through implemen- 70
26 tation of waste management BMPs 71
27
 - 28 ■ Locate temporary sanitation facilities a 72
29 significant distance from waterways to 73
30 prevent releases 74
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 - 32 ■ Clean and wash vehicles and equipment 75
33 prior to arriving on site to avoid the impor- 76
34 tation of noxious weeds on site 77
35
 - 36 ■ Wash concrete trucks in designated 78
37 concrete washout areas at least 50 feet 79
38 away from surface water sources 80
39
 - 40 ■ Construct stabilized construction entrances 81
41 to the site to limit mud and dirt deposition 82
42 on local roadways 83
43
 - 44 ■ Follow BMPs appropriate to handle the 84
45 possibility of deicers used in and around 85
46 the construction site 86
47
 - 48 ■ Use erosion prevention measures to 87
49 prevent the need for extensive erosion 88
50 control. Erosion prevention measures 89
include staging construction to reduce 90
disturbance; minimizing access areas; 91
temporary seeding; early final grading 92
and seeding of completed areas; and clean 93
water diversions 94
95
 - Construct temporary and permanent water 96
quality basins. Permanent water quality 97
ponds can be constructed early and used 98
for construction runoff 99
100
 - Roughen disturbed surfaces throughout 100
construction
 - Use certified weed free mulch and hay 100
bales
 - Use temporary sediment control features 100
such as silt fence, erosion logs, erosion 100
bales, etc.
 - Reseed disturbed areas with a native 100
grass mix that includes forbs and shrubs. 100
The seed mix could include Oats (*Avena 100
sativa*) that will be applied at a low rate 100
to facilitate soil stabilization while native 100
plants are establishing.
 - Place permanent native seeding incremen- 100
tally throughout project
 - Place temporary stabilization (mulch and 100
mulch tackifier, soil binder) when native 100
seeding is not allowed due to seasonal 100
constraints
 - Stabilize all slopes steeper than 3:1 with 100
erosion control blankets
- Noise**
The following measures would be considered, where feasible, to reduce the effects of noise during construction:
- Enforce more restrictive work hours, particularly daylight hours, in residential areas

- 1 ■ Discourage weekend work, with the
2 exception of activities best suited for off-
3 peak hours
- 4
- 5 ■ Combine noisy operations to occur in the
6 same time period
- 7
- 8 ■ Use noise blankets or other muffling
9 devices on equipment and quiet-use
10 generators
- 11
- 12 ■ Require contractor to use well-maintained
13 equipment, especially with respect to
14 mufflers
- 15
- 16 ■ Conduct noise inspections
- 17
- 18 ■ Re-route truck traffic away from residential
19 streets, where possible
- 20
- 21 ■ Utilize alternative construction methods,
22 such as sonic or vibratory pile driving in
23 sensitive areas
- 24
- 25 ■ Require a noise monitoring and mitigation
26 plan, such as temporary noise barriers
- 27

28 Air Quality

29 All contractors would be required to obtain a
30 construction permit and develop a fugitive
31 emissions particulate emissions control plan to be
32 implemented during construction in accordance
33 with the Colorado Air Quality Control
34 Commission Regulation No. 1, Part 3D, and
35 Regulation No. 3, Applicable Permit
36 Requirements. The contractor would also be
37 required to minimize airborne dust during
38 construction through construction phasing to
39 prevent exposing bare dirt on the whole site at
40 once; stabilize soils through seeding and
41 mulching; and suppressing dust suppression
42 through regular watering.

44 Visual

45 Throughout the final design and construction
46 phases of this project, cities, counties, and public
47 stakeholders will be consulted to minimize
48 temporarily undesirable obstructed views.

Vibration

51 An attempt will be made to minimize nighttime
52 activities in residential areas. Vibration causing
53 operations would occur in the same time period.
54 Alternative construction methods, such as sonic
55 or vibratory pile driving in sensitive areas,
56 would be utilized whenever possible. Pile
57 driving and other high-noise activities would
58 also occur during daytime hours, where possible.
59

C-470 Trail

60 In order to provide uninterrupted service to trail
61 users, various strategies would be employed. In
62 no case would the trail be closed without
63 providing adequate detour routes. Adequate
64 signing of trail closures and detours would be
65 required. A minimum of two week's notice
66 would be provided for potential closures and
67 detours. These detours would be posted and
68 presented to trail user groups. Where possible,
69 the trail would be reconstructed in its new
70 location prior to closing the existing trail. In some
71 locations, a temporary trail surface may need to
72 be provided as a detour around work zones. In
73 other locations, an off-site detour may be
74 required if sufficient room is not available to
75 safely pass through the roadway construction
76 zone.
77
78

3.4 BIOLOGICAL ENVIRONMENT

80 The biological environment within the project
81 area is composed of the natural resources within
82 one mile of C-470. These resources include
83 wildlife, threatened and endangered species,
84 wetlands and waters of the U.S., prime and
85 unique farmlands, and vegetation.
86

3.4.1 Wildlife

87 Although much of the project area is highly
88 developed, a large number of wildlife species
89 make use of riparian habitat and undeveloped or
90 protected areas. Most of the species likely to be
91 found in the study are well adapted to human
92 disturbance. Common mammal species include
93 mule deer (*Odocoileus gemionus*), elk (*Cervus
94 elaphus*), coyote (*Canis latrans*), red fox (*Vulpes
95 vulpes*), raccoon (*Procyon lotor*), cottontail rabbit
96
97
98
99

(*Sylvilagus sp.*), deer mouse (*Peromyscus maniculatus*), and striped skunk (*Mephitis mephitis*).

Most of the stream crossings along C-470 serve as wildlife corridors under the highway. The most significant wildlife corridors are along the South Platte River and Big Dry Creek, where highway bridges allow for wildlife passage. Other wildlife crossings include Willow Creek, Dad Clark Gulch, and the High Line Canal, where box culverts allow for some wildlife movement. Fifteen culverts have been inventoried along C-470 between Kipling Parkway and Broadway, with an additional eight culverts east of Broadway. The smallest of these is 36 inches in diameter. These culverts often serve as small mammal crossings. **Figure 3-37** shows habitat areas for wildlife species found in the project area.

3.4.1.1 Affected Environment Mule Deer and Elk

Mule deer (*Odocoileus hemionus*) is an important big game species found in most habitat types in Colorado. They are most common in shrublands on rough, broken terrain that provides abundant browse and cover. Mule deer are especially common along the foothills of the Front Range. Mule deer are likely to occur in and near the western portions of the C-470 project area, especially in the South Platte River floodplain and along the Dakota hogback.

American elk (*Cervus elaphus*) are commonly found in semi-open forest or along forest edges above 6,000 feet. Elk are known to migrate through the Chatfield Basin to the southwest of the C-470 project area and along the Dakota hogback to the west of the project area, and may occasionally venture into the C-470 project area, particularly in the winter.

The existing C-470 highway poses a substantial barrier to movement by both of these species. Mule deer are likely to use the South Platte River and Big Dry Creek bridges as movement corridors, while the likelihood of elk crossing C-470 to the north and east is small due to the

absence of suitable habitat in the urbanized areas. Although the South Platte River bridge is likely a major movement corridor, it provides little room for wildlife movement along the river banks due to the existing trail and riprap. An existing chain link fence extending east and west from the South Platte River currently serves as deer fence. Mule deer also may occasionally cross the C-470 surface during low traffic periods. Historic accident data obtained from the *Safety Chapter for the C-470 Corridor Environmental Assessment* (February 2005), indicates that vehicle collisions due to wild animals is slightly below the statewide average for similar type highway facilities.

Black-tailed Prairie Dog

During the 2003 field review, 21 black-tailed prairie dog colonies covering about 90 acres were observed on vacant land throughout the C-470 project area. The black-tailed prairie dog (*Cynomys ludovicianus*) is a burrowing mammal that forms large colonies in shortgrass or mixed prairie along the Colorado Front Range. In August 2004, the U.S. Fish and Wildlife Service (USFWS) removed the prairie dog from consideration as a candidate for listing as a threatened species under the Endangered Species Act (ESA). However, the Colorado Division of Wildlife (CDOW) lists it as a state species of special concern. This category does not provide statutory protection. The *CDOT Impacted Black-tailed Prairie Dog Policy* (March 2005) requires implementing conservation measures including avoiding impacts and relocating individuals when possible. Prairie dogs can play an important role in grassland ecosystems by contributing to nutrient cycling and grassland regeneration, and by providing habitat for numerous other vertebrate species.

Raptors

During the 2003 field surveys, six active red-tailed hawk (*Buteo jamaicensis*) nests and one active prairie falcon (*Falco mexicanus*) nest were observed in the C-470 project area. These nests were inactive in 2003, but have been active in the last three years. Known nest sites for great