



CHAPTER 1.0: PURPOSE AND NEED FOR PROPOSED ACTION

1.1 INTRODUCTION

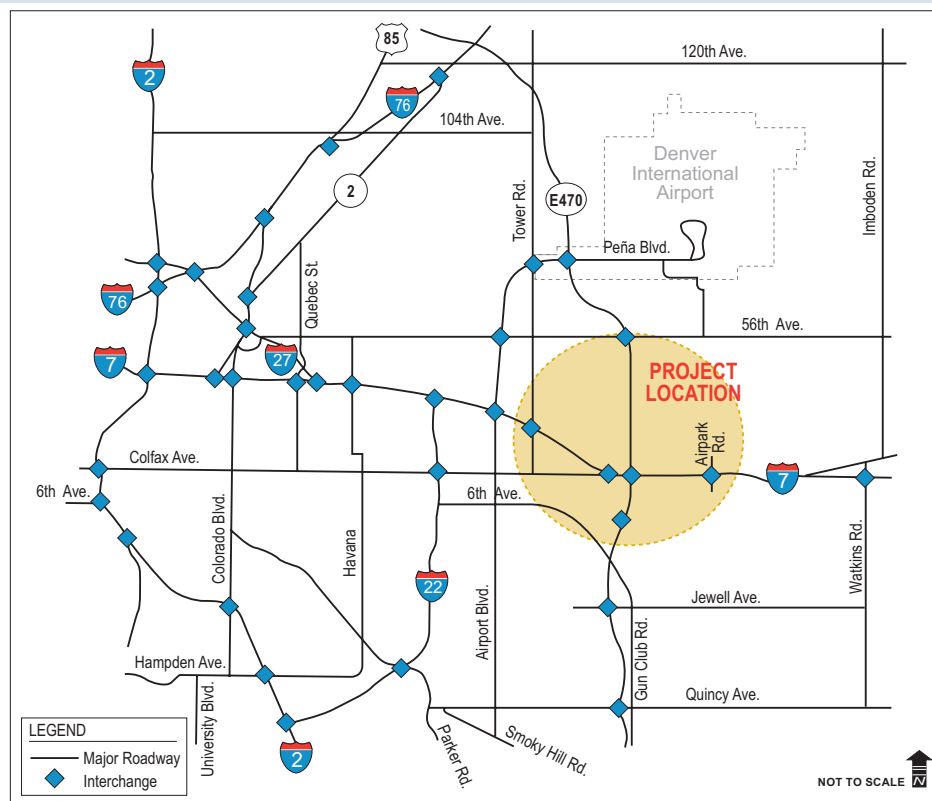
The Federal Highway Administration (FHWA), the project's lead federal agency, in cooperation with the project's lead agencies that include the Colorado Department of Transportation (CDOT), the E-470 Public Highway Authority (E-470 Authority), and the City of Aurora, as sponsors of this study, have identified a system of access improvements to the Interstate 70 (I-70) and E-470 highways. Additional technical oversight was provided by Arapahoe County, Adams County, Denver International Airport (DIA) and the Denver Regional Council of Governments (DRCOG). The study includes preliminary engineering to develop alternative improvements and conduct environmental studies to assess potential impacts to the study area. This report describes the study process and addresses specific

19 questions that have been raised during the public
20 involvement process.

1.2 PROJECT LOCATION

The project study area is located on the eastern fringe of the Denver-Aurora metropolitan area in northeast Aurora, south of DIA (see **Figure 1-1**). I-70 is the major east-west interstate route serving Colorado and passes through the study area between Air Park Road on the east and Tower Road on the west. E-470 is the toll road serving as a circumferential belt highway around the eastern portions of the metropolitan area. The E-470 roadway in the study area extends from the 6th Parkway interchange on the south to north of 26th Avenue.

Figure 1-1
Regional Project Vicinity





1.3 PROJECT BACKGROUND

The E-470 tollway was conceived in the late 1980s as a belt highway around the eastern perimeter of the Denver-Aurora metropolitan area that could meet growing travel demands. The highway could not be financed for many decades by then-current transportation funding sources. The E-470 Authority was established in 1988 by Adams, Arapahoe, and Douglas Counties under the Public Highway Authority Act as the entity that would design, build, and finance the tollway. The E-470 Authority was subsequently expanded to include the Cities of Aurora, Commerce City, Brighton, Thornton, and the Town of Parker.

The I-70/E-470 interchange complex is located partly in the City of Aurora, with portions in unincorporated Adams and Arapahoe Counties. The proposed project centers around the junction of I-70, the one east-west interstate highway which traverses the entire state of Colorado, and the E-470 tollway. The 47-mile-long toll road circles the eastern half of the Denver-Aurora metropolitan area, connecting with I-25 to the south in Douglas County and I-25 to the north in Thornton.

The *E-470 Environmental Study*, dated July 1993, and updated March 1994, described a three-phased development of the I-70/E-470 interchange. The first phase, with only minor turn lanes added to the Gun Club Road interchange, was anticipated to have acceptable traffic operations until 2005. The second phase to handle traffic through 2010 included a new roadway for E-470 through traffic, and possibly a cloverleaf interchange eliminating access between Gun Club Road and I-70. Phase 3, for some time after 2010, included directional or semi-directional ramps between E-470 and I-70.

37 **Why did E-470 move from the more easterly alignment?**

Initial planning for E-470 identified an alignment more to the east of the location ultimately developed. Analysis of that initial alignment indicated that traffic volumes would be insufficient to produce sufficient revenue to finance construction of the toll road. Studies of alternative alignments were conducted in 1992 and 1993, including extensive environmental studies and a public involvement program. These studies identified the current alignment closer to the Gun Club Road section line as serving a lot more traffic and generating the toll revenue to support the payback to the bond holders.

The proposed action at the I-70/E-470 interchange complex is composed of three separate interchanges. The complex would replace the present I-70 diamond interchange at Gun Club Road that has been used as a temporary interchange to connect I-70 and E-470. The Preferred Alternative would also replace the partial interchange between I-70 and Colfax Avenue. A new freeway-to-freeway interchange is proposed to provide full directional movements between I-70 and E-470. Two new interchanges are proposed at I-70 and Picadilly Road and at I-70 and Harvest Road to provide local access off of the interstate.

38 **Why were traffic lights allowed on a high-speed toll road?**

E-470 initially was faced with budget limitations, and traffic projections showed that the existing I-70 diamond interchange at Gun Club Road could be used on an interim basis. While this required E-470 traffic to pass through four traffic signals, it deferred the \$50 million cost of a new directional interchange. This arrangement received favorable approval from both CDOT and FHWA.

39 **Nearby residents have said that they were promised continued free access to I-70 when E-470 was built. Why is this changing?**

During the interim use of the I-70/Gun Club Road interchange for E-470 traffic, local free access has been preserved from Gun Club Road, Smith Road, and Colfax Avenue. In evaluating numerous alternatives for a full, separate interchange between I-70 and E-470, design guidelines for safe operations did not permit retaining Gun Club which would have resulted in decision points too closely spaced, as well as confusing signing. This led to the need to add two new local service interchanges at Picadilly Road and Harvest Road to maintain free access to I-70. The full safety analysis can be found in the document titled *Technical Memorandum-Safety Analysis for Ramp H*, November 2005.

1.4 PROPOSED ACTION

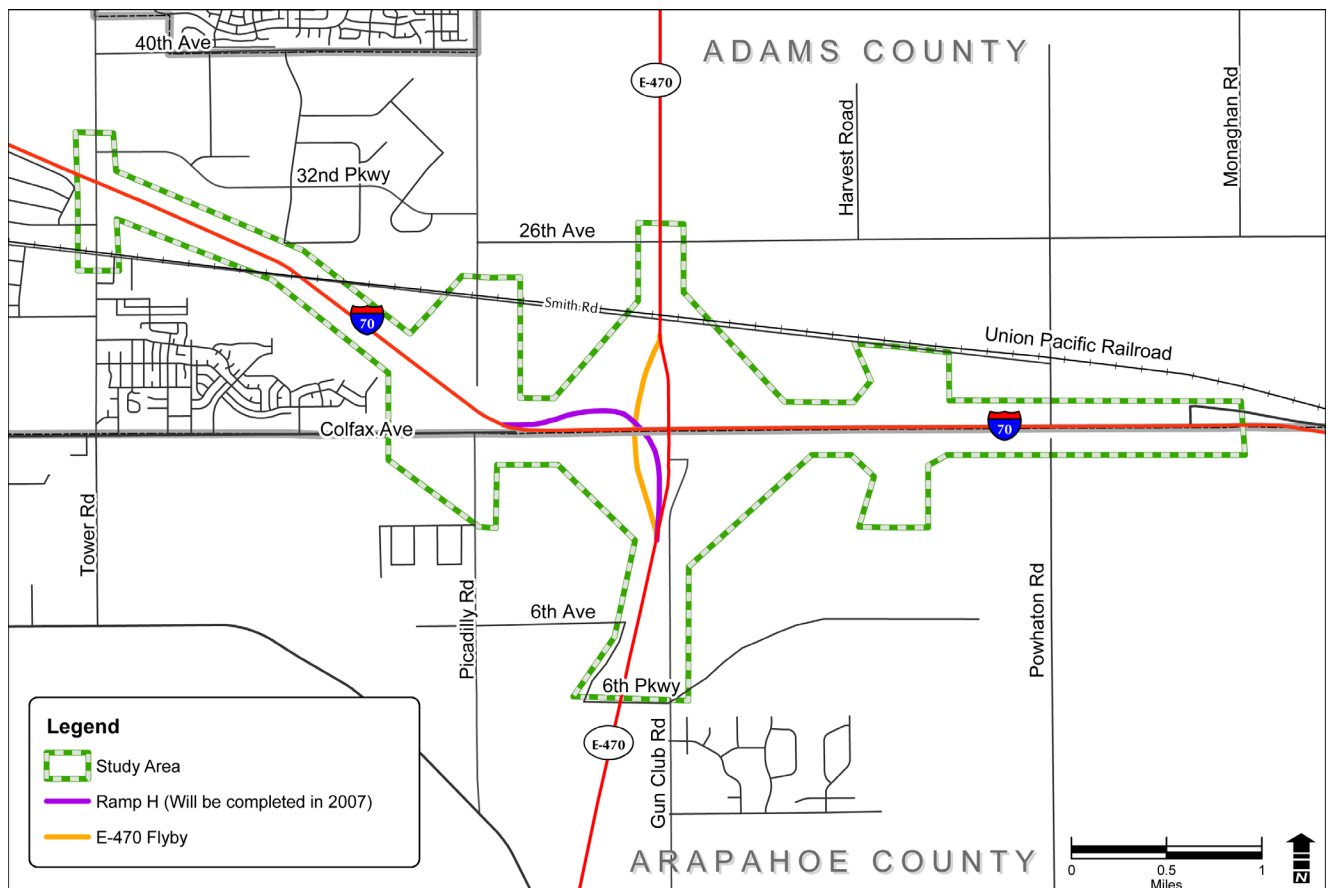
The proposed action is to ultimately construct new system-to-system (freeway-to-freeway) interchange ramps between the E-470 and I-70, while maintaining service-to-system (arterial-to-freeway) access with I-70. See **Figure 1-2** for a map of the study area. The study area includes the I-70 interchange at E-470 and extends from the I-70/Tower Road interchange on the west to the I-70/Air Park Road on the east, and along E-470 from the 6th Parkway interchange on the south to north of 26th Avenue on the north. FHWA is the lead federal agency for the National Environmental Policy Act (NEPA) process. CDOT is the applicant.

As a result of the extensive preliminary traffic and environmental studies prior to this EA, a complex of

three separate interchanges is the proposed action—the I-70/E-470 interchange complex. This would include a system-to-system interchange between I-70 and E-470 and two system-to-service interchanges, one replacing the existing partial interchange between I-70 and Colfax Avenue with a new full interchange at Picadilly Road, and a new interchange between I-70 and Harvest Road.

What is the difference between a system-to-system interchange and a system-to-service interchange? A system-to-system interchange is one that connects two major interstates or key metropolitan freeways or toll roads and serves interregional trips. A system-to-system interchange provides continuous flow ramps without traffic signals. A system-to-service interchange, in contrast, provides access to the freeway from subregional developments, in effect providing service or access to adjacent communities.

**Figure 1-2
Study Area**





1.5 PURPOSE AND NEED

The purpose of the project is to link the freeway and tollway systems, I-70 and E-470, in an efficient and safe manner while maintaining and enhancing local access for the existing and planned roadway system and future travel demand. This will be accomplished while maintaining the integrity of the mainline I-70 roadway, particularly with regard to traffic safety and operations.

The need for the project is three-fold:

1. Improve regional mobility

The E-470 Authority in January 2003 completed the last link in the toll facility from I-25 and C-470 at the southern terminus to I-25 south of 160th Avenue at the northern terminus. E-470 provides access to DIA. It serves the fast-growing Douglas, Arapahoe, and Adams Counties area, as well as major portions of the City of Aurora. I-70 is the major east-west interstate freeway in Colorado and is a strategic link in the nationwide highway network. The I-70 freeway and E-470 are major components of the transportation network serving the Denver metropolitan area. Substandard connections to these highways are affecting regional mobility. Modifications to the freeway-to-freeway interchange ramp connections are needed to improve regional mobility and safety, and to serve forecasted traffic volumes.

Currently, the I-70/E-470 ramp movements must pass through one or more of four closely spaced signalized intersections. It is highly desirable to design an interchange complex that will satisfy both the freeway-to-freeway linkages and local access needs, while accommodating future travel demands.

2. Roadway deficiencies

Currently, E-470 in the study area has ramp movements passing through the closely spaced signalized intersections that do not meet American Association of State Highway and Transportation Officials (AASHTO) standards for freeway-to-freeway connections. The flyby, which has been recently opened, grade separates the through E-470 roadway

from Gun Club Road. Ramp H will also provide a direct connection from northbound E-470 to westbound I-70. However, other substandard ramp connections are not yet being updated because the remaining ramp connections are the subject of the alternatives analyzed in this EA. I-70 in the study area has interchange deficiencies, including substandard weaving distances, a non-standard two-lane left exit ramp from I-70 westbound to Colfax, and substandard ramp acceleration and deceleration lanes at the Gun Club/E-470 interchange. Presently, I-70/Colfax (US 40) has a partial interchange, which is missing the westbound entrance ramp to I-70. These interchange deficiencies on both E-470 and I-70 will contribute to increased safety risks as traffic volumes increase.

3. Enhance access for the adjacent land uses

DRCOG's 2030 Metro Vision Regional Transportation Plan forecasts a substantial amount of new development in the study area and surrounding areas. It is anticipated that the demand on the existing arterial network will be a lot greater than the existing arterial network capacity.

Maintaining arterial access and access for the adjacent land uses to the freeway network is critical since the portion of the City of Aurora surrounding the existing I-70 interchange with E-470 and Gun Club Road includes substantial land areas under development. Immediately north of I-70, light industrial uses and distribution centers are developing. The zoning in the *City of Aurora Comprehensive Plan*, 2003 depicts major regional retail, commercial, and residential development on adjacent properties south of I-70. The plan includes major arterial roadways west and east of E-470 at Picadilly Road and Harvest Road, as well as arterials that parallel I-70 on the north and south sides, including Colfax Avenue and Smith Road.

The linkages between I-70 and E-470 with the existing and planned arterial network in the study area are vital to service the existing and proposed commercial and residential developments of northeast Aurora. To avoid confusion to drivers and complex

1 traffic operations, separation of service access from
 2 the freeway-to-freeway interchange is desirable.

3
Why can't the I-70 interchange at Gun Club Road be left in place for local access? Portions of the Gun Club Road access will remain in place until added ramps are constructed between I-70 and E-470. Ultimately, however, I-70/E-470 ramps need to be upgraded to create higher speed and higher capacity connections for regional traffic movements between I-70 and E-470. These types of high-speed ramps serving regional traffic (similar to the I-25/I-70 interchange in Denver or the I-25/E-470/C-470 interchange in Douglas County) are not compatible with local access ramps like the existing I-70/Gun Club Road ramps. The combination of regional traffic flow and local access movements would create safety conflicts and negatively affect traffic flow on the regional freeway and tollway system. Thus, the local access to I-70 that is currently provided by the Gun Club ramps will be replaced with full movement I-70 interchanges at Picadilly Road and Harvest Road.

4
Why can't I turn left at I-70 heading westbound without the green arrow? With the current volume and speed of traffic passing through the Gun Club interchange, and the high number of crashes experienced at the left turn intersections compared with other similar intersections, CDOT has provided "protected" left turn signal arrows, permitting left turns only when the opposing traffic has a red light. With the completion of the flyby and Ramp H, the volume of traffic passing through the signalized intersections will be reduced and CDOT will review the signal operations. It may be possible to keep the green arrows for left turns on for longer periods.

5
Isn't the flyby and the new flyover ramp (Ramp H) enough? Why do more? The flyby and Ramp H may permit safe operation of the I-70/Gun Club Road interchange for many years. That time period will depend on the pace of residential, industrial and commercial development in the area and the resulting traffic increases. Current traffic forecasts based on the DRCOG regional forecasts of population and employment show that a complex of three interchanges will be needed by 2030 to serve future regional and local trips.

6
Why isn't I-70 being widened? The EA and the Preferred Alternative must be consistent with the *DRCOG 2030 MVRTP*. Widening of I-70 is not included in that plan. However, all of the concept plans have been developed to not preclude the future widening of both I-70 and E-470 that may be necessary in the future.

7 I.6 PREVIOUS STUDIES

8 A number of studies of the I-70/E-470 interchange
 9 have been conducted over the past several years
 10 supporting the need for additional arterial and free-
 11 way/tollway capacity to serve the ever-growing
 12 Denver-Aurora metropolitan area. The list includes:

- 13 ▶ *I-70/Gun Club Road Interchange Improvement Plan and Capacity Analysis for Future I-70/E-470 Interchange*, July 5, 1993
- 14
- 15
- 16 ▶ *E-470 Environmental Study of Alternative Alignments*, March 1994
- 17
- 18 ▶ *Aurora Northeast Area Transportation Study*, December 1999
- 19
- 20 ▶ *Draft I-70/E-470 System Level Study Appendix*, March 5, 2001
- 21
- 22 ▶ *Arapahoe County Comprehensive Plan*, June 2001
- 23
- 24 ▶ *Final E-470/I-70 System Feasibility Study*, April 11, 2002
- 25
- 26 ▶ *Draft I-70/E-470 System Level/Project Level Feasibility Study*, October 2003
- 27
- 28 ▶ *City of Aurora Comprehensive Plan*, October 2003
- 29
- 30 ▶ *Adams County Comprehensive Plan*, January 2004
- 31
- 32 ▶ *DRCOG Metro Vision 2030 Plan*, January 2005 (fiscally non-constrained)
- 33
- 34 ▶ *DRCOG 2030 Metro Vision Regional Transportation Plan*, January 2005 (fiscally constrained)
- 35
- 36 ▶ *CDOT's I-70 Corridor Assessment Study*



1

These previous studies only looked at I-70/E-470 and Gun Club Road. Why are you now looking at Picadilly Road and Harvest Road? Development of detailed concept plans and traffic operations analyses showed that combining local access at I-70 and Gun Club Road with the freeway-to-tollway ramps between I-70 and E-470. This would result in an unacceptable interchange design with too many decision points this would resulting in confusing and potentially dangerous situation for drivers where effective signage would be difficult. As a result, CDOT, E-470 and Aurora, with concurrence from FHWA, agreed to expand the study area to include consideration of alternatives which would include I-70 interchanges at Picadilly Road and Harvest Road.

2

1.7 PLANNING CONTEXT

3 The I-70/E-470 Interchange Complex Environmental
4 Assessment (EA) is being conducted in conformance
5 with the DRCOG 2030 Metro Vision Regional
6 Transportation Plan (2030 MVRTP) for the Denver-
7 Aurora metropolitan region. The DRCOG plan was
8 developed through a cooperative planning process
9 that involved all the counties and municipalities in
10 the region. The plan is fiscally constrained to reflect
11 federal and state funds anticipated in the planning
12 period. The plan is multimodal and includes
13 detailed population and employment forecasts for
14 small areas that are then utilized to forecast future
15 travel in the region.

16 In addition to the regional plan, the City of Aurora
17 conducted the *Northeast Aurora Transportation*
18 *Study* (NEATS), which examined future travel pat-
19 terns and roadway needs in the section of Aurora
20 that included the EA study area. As part of NEATS,
21 both Picadilly Road and Harvest Road were identi-
22 fied as needed future road improvements and inter-
23 changes with I-70, and both arterials were part of
24 the recommended plan. The NEATS recommenda-
25 tions were adopted by the City of Aurora in 2002.
26 The City of Aurora also adopted a Comprehensive
27 Plan in 2003, which included major improvements
28 for Picadilly Road and Harvest Road along with
29 interchanges for both routes at I-70.

30 1.8 EXISTING ROADWAY PROJECTS

31 The E-470 Authority has just opened a new main-
32 line roadway for the toll road to allow through
33 north-south traffic to bypass the four signalized
34 intersections. This improvement, called the flyby,
35 was funded primarily by the E-470 Authority
36 through bond financing with some contribution by
37 CDOT. The flyby will remove the high-speed
38 through traffic from the I-70/Gun Club Road dia-
39 mond interchange (see **Figure 1-3**). In addition, the
40 E-470 Authority is constructing Ramp H, a new
41 direct connection between northbound E-470 and
42 westbound I-70, as a further safety improvement.
43 This is being paid 100 percent by the E-470 Author-
44 ity with no federal or state funds.

45 1.9 PLANNED TRANSPORTATION 46 PROJECTS

47 As part of the DRCOG 2030 MVRTP, widening of E-
48 470 to six lanes is anticipated by 2030. A new inter-
49 change on E-470 is also planned at 48th Avenue.
50 These improvements would be funded by the E-470
51 Authority with no federal or state funds. The City of
52 Aurora, in addition to improvements to Picadilly
53 Road and Harvest Road, is planning to improve 6th
54 Avenue/Parkway as a major east-west arterial
55 between SH 30 and Monaghan Road. Aurora also
56 plans to extend Tower Road between Colfax Ave-
57 nue and SH 30. These local arterial improvements
58 are included in the *City of Aurora Comprehensive*
59 *Plan*, 2003 and the DRCOG 2030 MVRTP. They are
60 anticipated to be funded as part of future land devel-
61 opments. **Figure 1-3** shows the location of these
62 improvements. The DRCOG 2030 MVRTP includes
63 new interchanges for I-70 at both Picadilly Road
64 and Harvest Road.

65 While it is outside the EA study area, the Regional
66 Transportation District (RTD), as part of the Fas-
67 Tracks plan approved by the voters in 2004, plans
68 to construct a new rail transit line, the East Corridor,
69 between Denver Union Station and DIA. FasTracks
70 also includes an expanded bus network, called Fast

**Figure 1-3
Planned Transportation Projects**



1 Connects, which would provide new bus routes to
 2 serve the new developments in the study area and
 3 provide connections with the new East Corridor.

4 While not part of the current FasTracks program, the
 5 E-470 Authority has made provision in the design of
 6 the toll road to accommodate a future transit line in
 7 the median of E-470 if warranted. The type of transit
 8 would be determined at a future date after its need
 9 has been identified in a future constrained plan.

10 The study area is also served by the Union Pacific
 11 Railroad (UPRR). Spur tracks off the main rail line
 12 provide freight service to many area industries,
 13 including the new General Motors distribution center.
 14 Union Pacific is also planning to relocate much
 15 of its intermodal transfer operations to the Front
 16 Range Airport area just to the east of the study area.

17 As part of the planning for the I-70/E-470 inter-
 18 change, provision is being made to accommodate
 19 the addition of two new tracks to the UPRR line to
 20 serve growing freight business.

21 **Who is responsible for building these new roads?** Construction of arterial and local streets to provide access is a condition of approval for development within the City of Aurora. Aurora, like other cities in Colorado, has the responsibility to maintain efficient and safe access and mobility as the city develops. Developers are required to prepare traffic studies that project the travel demands that will be created by proposed developments, and to provide local streets and their fair share of regional roads to accommodate those travel demands.



¹ **Why is Aurora proposing to add all these new streets?** More than 8,000 new residents and jobs are projected by the Denver Regional Council of Governments (DRCOG) for the immediate area around I-70/E-470 by 2030. For the larger area of eastern Aurora, DRCOG projects a more than four-fold increase in population to 192,000 residents in 2030. The City of Aurora continually prepares plans for the development of the city and for services to adequately serve the planned development. Specifically, the City of Aurora, with extensive involvement of the public, prepared the *Aurora Northeast Area Transportation Study* in 1999 and the *City of Aurora Comprehensive Plan* in 2003. Both of these plans evaluated travel demands associated with forecasted development and include a planned roadway system to serve those demands. The plans also include a system of arterial streets throughout the city's growth areas. There are plans to construct, extend, and upgrade roads through and around the I-70/E-470 study area, including Picadilly Road, Harvest Road, Powhaton Road, Monaghan Road, 6th Parkway/Avenue, Colfax Avenue, and 26th Avenue.