



# Logical Termini Analysis

*March 2005*

Submitted To:   
**CDOT Region 6**  
2000 S. Holly  
Denver, CO 80222

Submitted By:   
**Wilson & Company**  
999 18<sup>th</sup> Street, Suite 2600  
Denver, CO 80202



## **C-470 Corridor Logical Termini Analysis**

### **I. Background**

Logical termini are defined as rational end points for a transportation project and corresponding environmental review. Three conditions must be met as set forth in 23 CFR 771.111(f) paraphrased as follows:

1. Connect logical termini and be of sufficient length to address environmental matters on a broad scope
2. Have independent utility or independent significance – that is, be usable and be a reasonable expenditure even if no additional transportation improvements are made
3. Not restrict the consideration of alternatives for other reasonably foreseeable transportation improvements.

For projects that have the fundamental need for addressing congestion, end points can be major traffic generators, typically intersecting roadways. However, the reach of the project between these intersecting roadways must be of sufficient length to assess environmental impacts on a broad scale. As provided in Case #2 of the Logical Termini guidance (FHWA 1993), intermediate end points can be used as logical termini if the following conditions are met.

- A. The project must serve an identified need
- B. The project will not force immediate transportation improvements on the remainder of the roadway and therefore cause problems or environmental impacts that are currently not known because the remainder of the roadway has not been addressed
- C. Even if there is a demonstrated need in the remainder of the corridor, intermediate end points may still be chosen as logical termini if there is no funding available and no likelihood of improving the entire corridor.

### **II. Application to C-470**

#### Condition A

The primary need for improvements along C-470 is to address congestion. Figure 1 presents existing and future 2025 average daily traffic volumes and volume to capacity (V/C) ratios for mainline C-470 between I-70 and I-25. The volume of traffic and resulting high V/C ratios between I-25 and Kipling are evident. High levels of congestion exist on this section currently, and the congestion will only worsen with greater demand expected in the future.

Conversely, the existing and 2025 volumes tend to drop (with resulting improvements in levels of service) west of Kipling due to a shift in the road's orientation from generally east/west to generally north/south. The nature of the land use west of Kipling also shifts, with less intense commercial development, contributing to lower traffic volumes and satisfactory traffic operations through the 2025 planning horizon.

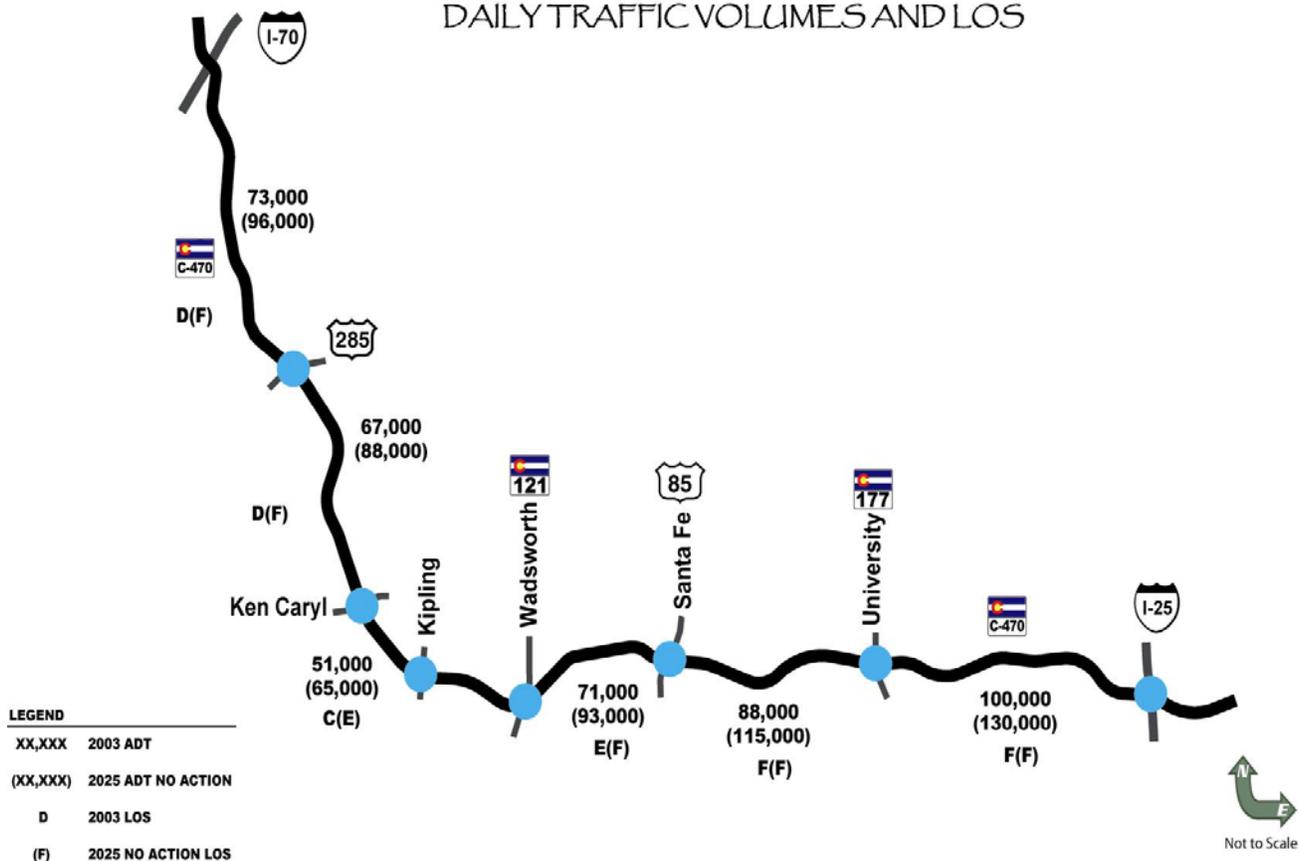
Development pressure is also substantially greater along the east-west leg of C-470 than the north-south leg. In the east-west leg, an example of this is Highlands Ranch, which is presently 80 percent built out and contains approximately 77,000 residents. Full build out by 2010-2015 will result in 37,000 homes and 100,000 new residents. At the same time employment in the I-25 corridor from I-225 to Lincoln Avenue is projected to grow from 117,000 jobs to 163,000 jobs by 2025. The large increase in employment, the residential growth in the Highlands Ranch area, the concentrated, separate land uses, and the high degree of correlation between the two areas will lead to greatly increased trips along the C-470 Corridor. As land uses mature, it will also cause traffic to grow substantially.

Conversely, the north-south leg contains areas of stability regarding land use. There are very few opportunity areas along the C-470 Corridor in Jefferson County including Bowles Avenue and near Wadsworth and Kipling Parkway, but for the most part, the land in Jefferson County is presently developed or is dedicated open space. There are over 7,000 acres of dedicated open space along the C-470 Corridor in Jefferson County including Bear Creek Lake Park. There are only 2,000 acres of potentially developable land in the same area and development is hindered by difficult topography and geological conditions as well as complicated patchwork of land ownership. There are approximately 70 land owners that own parcels in the area ranging from 0.3 to 131 acres in size. The built out nature of the area along with the difficult development conditions make it unlikely that any significant change will occur in Jefferson County.

Therefore, a project to address identified existing and future traffic congestion along C-470 would be in the I-25 to Kipling reach, meeting Condition A. Intersecting roadways or interchanges are being considered as end points for this environmental assessment.

**Figure 1**

CURRENT AND FORECASTED  
DAILY TRAFFIC VOLUMES AND LOS



**Condition B**

Condition B is met because improvements that might be made on the section of C-470 from I-25 to Kipling would not result in an immediate need for improvements to the west. Volumes are generally lower and levels of service are generally better on the west portion of the corridor. The west portion would be able to accommodate some increase in demand that would likely result from improvements east of Kipling.

Eventually, improvements west of Kipling would probably be needed. In the event improvements are needed, two aspects of Condition B should be considered. First is regarding the availability (or lack

thereof) of alternatives that can be evaluated in a future study, and the second is the possibility of environmental impacts of those alternatives that are currently unknown.

Table 1 presents an analysis of the availability of alternatives in the Kipling to I-70 reach of C-470, for several possible alternatives that could be evaluated, and possibly cleared, for the I-25 to Kipling reach of C-470. This table is not all-encompassing and does not include all potential modal alternatives which will need to be evaluated as part of the process.

**Table 1**  
**Five Possible Alternatives for I-25 to Kipling**  
**Compared to**  
**Possible Alternatives Available for Kipling to I-70**

Possible Alternatives from I-25 to Kipling	Possible Alternatives from Kipling to I-70	Does more than one alternative exist from Kipling to I-70?
1. Add two general purpose lanes in each direction	1. Add two general purpose lanes in each direction; 2. Add one general purpose lane in each direction; 3. Add one general purpose lane and one HOV lane in each direction; 4. No Action	Yes
2. Add two express lanes (free or tolled) in each direction	1. Add two express lanes in each direction if feasible 2. Add two general purpose lanes in each direction; 3. Add one general purpose lane and one HOV lane in each direction; 4. No Action	Yes
3. Add one general purpose lane and two express lanes (free or tolled) in each direction	1. Add two general purpose lanes in each direction; 2. Add two express lanes in each direction; 3. Add one general purpose lane and one HOV lane in each direction; 4. No Action	Yes
4. Add one general purpose lane and one HOV lane in each direction	1. Add two general purpose lanes in each direction; 2. Add two express lanes in each direction; 3. Add one general purpose lane and one HOV lane in each direction; 4. No Action	Yes
5. Add two general purpose lanes in each direction and provide a transit connection from Lucent to I-25	1. Add two general purpose lanes in each direction; 2. Add one general purpose lane and one HOV lane in each direction; 3. Add one general purpose lane in each direction and provide a transit facility; 4. No Action	Yes

The second aspect of Condition B is regarding environmental impacts in the connecting reach that would not be discovered until a later time, therefore, "pointing the gun". Because the recent (August

2003) environmental resource assessment for C-470 included background research and field verification for the entire C-470 Corridor from I-25 to I-70, the possible impacts (and likewise the assessment of whether there are unacceptable impacts) can be evaluated. The historic resources information for the corridor is based on a records search and a windshield survey. Figure 2 is a map of the environmental resources in the C-470 Corridor from I-25 to I-70.

#### Environmental Resources between Kipling and I-70 (sheets 4 through 8)

Black-tailed prairie dog colonies and endangered plant habitat are the predominate environmental resources that occur in the north-south reach of C-470 beyond Kipling. The right-of-way in this reach would accommodate two additional lanes in each direction with minimal environmental impacts. Interchange improvements in this reach could involve impacts outside the right-of-way. These interchanges include: Bowles, US 285/Quincy, and SH 8. The Alameda interchange has already been cleared by a FONSI.

- Bowles Interchange: Improvements at this interchange would very likely impact Black-tailed prairie dogs as the colonies extend up to the interchange ramps.
- US 285/Quincy Interchange: Improvements at this interchange would require the extension of the existing culvert carrying Turkey Creek under C-470. Any geometric changes to the northbound to eastbound ramp could impact Black-tailed prairie dogs and a small wetland that has formed within the loop ramp in this quadrant.
- SH 8 Interchange: Improvements at the SH 8 interchange will be constrained by the close proximity of SH 8 to Bear Creek and associated wetlands, riparian habitat and the Preble's Meadow Jumping Mouse (Preble's) habitat.

Future environmental studies will consider alternatives that avoid or minimize impacts to these resources, regardless of the project limits or the alternatives chosen for the current study.

#### Consideration of Cumulative Impact Assessment

In the case of an environmental evaluation of C-470 from I-25 to Kipling, CDOT will consider improvements from Kipling to I-70 as a reasonably foreseeable future action in the cumulative evaluation.

#### Condition C

Currently, the only potential funding source to address congestion and geometric deficiencies along C-470 was identified through the Colorado Value Express Lanes Feasibility Study (2001 Study). C-470 from Wadsworth to I-25 was identified in the 2001 Study as a prime candidate for some form of tolled express lanes, with consideration of untolled usage by high occupancy vehicles (HOVs) and transit providers. There are no other identified funding sources and therefore no likelihood for improvements in the near future between Kipling and I-70. This is also true of the I-25 to Kipling section if a tolling scenario does not prove to be the recommended alternative. Condition C is therefore met by understanding that there are no current or foreseen funds available for the I-70 to Kipling section and there is a potential funding source for the I-25 to Kipling section.

### **III. Conclusion**

Based on this analysis, it is recommended that the Environmental Assessment to address congestion in the C-470 Corridor consider a range of alternatives between I-25 and Kipling.