

CHAPTER 11

ACCESS CONTROL AND ACCESS MANAGEMENT

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CHAPTER 11

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11.0 INTRODUCTION

Access management is the planned and regulated interaction between the roadway network and property access. It is an intentional strategy that preserves a safe and efficient transportation system necessary for smart growth. Access management is the practice of limiting and separating conflicts points, and it is the collaboration between planners and developers about property access, and the interaction amongst different modes of travel.

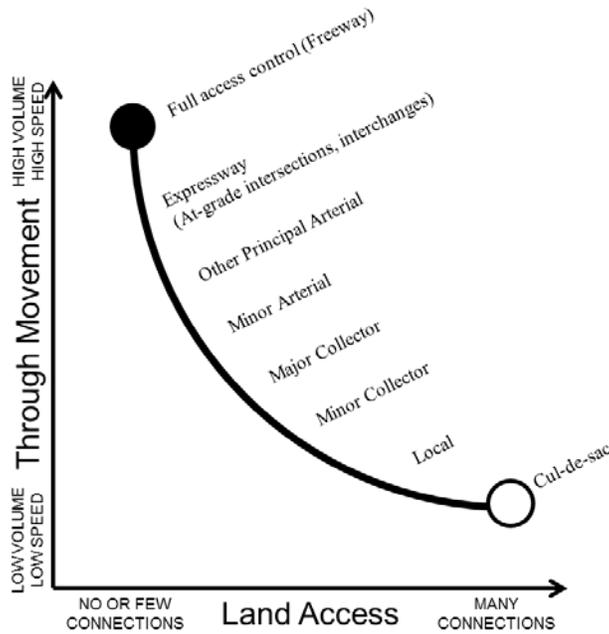
Access management is vital to protect and maintain the public's safety and welfare, maintain the functional roadway classifications, and meet the needs for the traveling public as well as the communities. Access management is a cost-effective approach to ensure the longevity of the public facilities with the likelihood of an increase of population growth and an increase in traffic volumes. Access management strategies must be made with care as these decisions will directly impact adjacent land use.

The objectives of access management are accomplished by applying the following principles found in TRB's *Access Management Manual (1)*:

- Provide a specialized roadway system.
- Promote intersection hierarchy.
- Locate signals to favor through movements.
- Preserve the functional area of intersections and interchanges.
- Limit the number of conflict points.
- Separate conflict areas.
- Remove turning vehicles from through traffic lanes.
- Use non-traversable medians on major roadways.
- Provide a supporting street network.
- Provide unified access and circulation systems.

11.1 FUNCTIONAL CHARACTERISTICS AND CATEGORY ASSIGNMENT CRITERIA

The roadway network is such that the highest classification roadways account for the smallest percentage of the network, yet carries the largest percentage of traffic volumes. These highest classification roadways typically carry traffic long distances, and at high speeds. Conversely, the lowest classification roadways account for the highest percentage of total roadway network, carries the least amount of traffic volume (in vehicle miles traveled), and at lower speeds. With this understanding, it is clear to see a direct correlation between roadway functions and land access. Figure 11-1 illustrates this relationship.



**Figure 11-1 [Exhibit 1-1 of the Access Management Manual (1)]
Conceptual Roadway Functional Hierarchy**

CDOT’s *State Highway Access Code (2)* defines a system of eight highway categories arranged in a hierarchical order. Table 11-1 illustrates these categories in their tiered order.

F-W Interstate System, Freeway Facilities	
E-X Expressway, Major Bypass	
Rural	Non-Rural
R-A Regional Highway	NR-A Regional Highway
R-B Rural Highway	NR-B Arterial
	NR-C Arterial
F-R Frontage Roads (both Urban and Rural)	

Table 11-1 [Table 3.1 of the State Highway Access Code (2)] Overview of the Access Category Classification Hierarchy

All segments of all state highways throughout the State of Colorado have been assigned an access category classification, which can be found in the *State Highway Access Category Assignment Schedule (3)*. Roadway classifications range from F-W Interstate System, Freeway Facilities as the highest categorized facility, to the F-R Frontage Roads (both urban and rural) as the lowest categorized facility. Descriptions of these functional classifications can be found in Section Three of the *State Highway Access Code*. Also found within this section is criteria for granting access, access spacing, auxiliary lane requirements, and traffic signal treatments.

11.2 ACCESS COORDINATION

Consideration of Access Management is a function of the Operations Analysis within the TSM&O Evaluation. Additionally, coordination and collaboration with stakeholders is a consideration of the Coordination function within the TSM&O Evaluation. See Section 4.12 TSM&O Evaluation in the *Project Development Manual (4)*.

Additional information for access points and access permits can be found on CDOT's Access Program Website <https://www.codot.gov/business/permits/accesspermits> or by contacting the CDOT Access Program Administrator.

11.3 DESIGN STANDARDS AND SPECIFICATIONS

If an access permit is approved, the following design standards and specifications, also found in Section Four of the *State Highway Access Code (2)*, shall be followed to meet the criteria defined in Section Three of the *State Highway Access Code (2)*.

11.3.1 Sight Distance

Access permits shall only be approved at locations which maintain adequate, unobstructed sight distance in both directions from the access for motorists of the access, or motorists passing the access. See Section 9.8 for intersection sight distances. Table 11-2 identified the appropriate design vehicle to be used for sight distance calculations.

Land Use(s) Served by Access	Design Vehicle(s) (to be used for Sight Distance calculations)
Residential (A Non-School Bus Route)	Passenger Cars, Pickup Trucks
If Access is a Part of Any School Bus Route Regardless of Land Use	No Less Than Single Unit Trucks
Office	Single Unit Trucks
Recreational	Single Unit Trucks
Commercial/Retail	Multi-Unit Trucks*
Industrial	Multi-Unit Trucks*
Municipal Streets & County Roads	Multi-Unit Trucks*
Agricultural Field Approaches, < 1 Per Day	Single Unit Trucks
*If Less Than 2 Multi-Unit Truck Trips Per Day (Average), Use Single Unit Truck	

Table 11-2 [Table 4-3 of the *State Highway Access Code (2)*] Design Vehicle Selection

11.3.2 Access Spacing

The minimum spacing between accesses is based on the calculated sight distance along the highway. In instances where speed change lanes are or will be present, access spacing shall be a minimum of the speed change lane including transition tapers. Accesses shall not be permitted within a speed change lane including transition tapers. See section 9.17 for speed change lane requirements.

11.3.3 Access Width

Table 11-3 illustrates access widths for one-way and two-way accesses. In instances where a public roadway access intersects the state highway, the access width shall be a function of long term traffic projections and modal use.

Design		Criteria
One-Way Access	16' - 18'	
Two-Way Access	16' - 30'	SU Peak Hour Volume < 5
	25' - 40'	When one or more of the following apply: <ul style="list-style-type: none"> • SU Peak Hour Volume > 5 • Multi-Unit Vehicles intended to use Access • SU Vehicles in excess of 30 feet in length • Special Vehicles Using the Access > 16 feet wide
Two-Way Public Access	> 36'	Design Hourly Volume > 10

Table 11-3 Access Width

See the *State Highway Access Code (2)* for additional access width measurement criteria.

11.3.4 Access Radii

Access radii shall be a minimum of 20 feet. In instances where shoulders are not present, access radii shall be 25 feet for residential and field accesses. If the design vehicle intended to use the access daily is a single-unit exceeding 30 feet, multi-unit, or another vehicle requiring a larger radius, the minimum turn radius accommodating this design vehicle shall be used. Access radii shall allow safe maneuvers without intrusion into adjacent highway travel lanes. In instances where multiple larger vehicles are likely to oppose each other at the access, the radii should be adequate to accommodate both vehicles without conflict or undue slowing. Local design standards shall be followed unless minimums listed here are not met. Radii shall be designed only to that required to minimize pedestrian conflicts.

See the *State Highway Access Code (2)* for additional access radii information.

11.3.5 Access Surfacing

Accesses shall be surfaced before opening to public use. Access surface material may include gravel, asphalt, and concrete. At a minimum, accesses shall be surfaced between the roadway and the right-of-way line. Table 11-4 illustrates the hard surface minimum limits. In instances where a hard surface access joins existing pavement, a minimum one foot saw cut is required for the tie in. Access surfacing materials and design shall conform to the local design standards, unless minimums listed here are not met.

Criteria	Hard Surface Minimum Limits From Traveled Way (ft)
5 AADT	4
20 AADT	20
100 AADT	50
Turn Lane	50

Table 11-4 Hard Surface Minimum Limits

See the *State Highway Access Code (2)* for additional access surfacing information.

11.4 SPEED CHANGE LANES

Speed change lane considerations are discussed in section 9.17.

11.5 OTHER DESIGN ELEMENTS

At curb cut locations, crest curves shall not exceed a four inch hump per ten foot chord, and sag curves shall not exceed a four inch dip per ten foot chord, to assist in preventing vehicle drag. At locations which utilize curb returns and not curb cuts, the first 20 feet beyond the travel way shall slope away from the highway at two percent. Some exceptions may be permitted on a case by case basis, but shall protect the highway from drainage flows.

Within the right-of-way, field and residential accesses shall not exceed ten percent grade, and all other accesses shall not surpass eight percent. Accesses within the right-of-way shall be designed to not impede future use of the right-of-way. The access centerline shall intersect the highway centerline at 90 degrees unless safety concerns dictate otherwise. The access shall extend from the edge of travel way in a tangent direction at least 40 feet, or to the right-of-way, whichever is greater.

All signing, striping, traffic signals, and other traffic control, shall conform to standards presented in the *Manual on Traffic Control Devices (MUTCD) (5)*.

See the *State Highway Access Code (2)* for additional design information.

11.6 EMERGENCY ACCESS

Emergency accesses may be less than 16 feet wide, so long as one-way traffic is still accommodated. The access should be unsuspecting to avoid use by the public but still of sufficient strength to accommodate emergency vehicles. Radii may be omitted as emergency vehicles may utilize the access unimpeded. Any barrier used to close off this access must be outside of the highway right-of-way.

See the *State Highway Access Code (2)* for additional emergency access information.

11.7 DRAINAGE

The existing highway drainage system is designed to accommodate the drainage relative to the state highway and not for development outside of the right-of-way (beyond historical flows). Any drainage entering the system from accesses shall not exceed the rate of historical flow. Any drainage appurtenances such as a detention pond must be fully located outside of the right-of-way. In locations where curb and gutter exist, a storm sewer system should be the drainage option of design. In locations where there is no curb and gutter, a roadside ditch should be the drainage option of design.

See the *State Highway Access Code (2)* for additional drainage information.

REFERENCES

1. TRB. *Access Management Manual*, Second Edition, Transportation Research Board, Washington D.C.: 2014.
2. CDOT. *State Highway Access Code (Code of Colorado Regulations 601-1)*, as adopted and amended by the Transportation Commission of Colorado, Revised March 2002.
3. CDOT. *State Highway Access Category Assignment Schedule, (Code of Colorado Regulations 2 CCR 601-1A)*, as revised and adopted by the Transportation Commission of Colorado, September 2013.
4. CDOT. *CDOT Project Development Manual*, Colorado Department of Transportation, 2013 (with revisions through 2016).
5. FHWA. *Manual on Uniformed Traffic Control Devices for Streets and Highways (MUTCD)*, U.S. Department of Transportation, Federal Highway Administration, Washington, D.C.: 2009.