Case 5

**Background**

The fifth case study is located at the intersection of a U.S. highway and a local major arterial roadway in a suburb of a large metropolitan area. These two roadways meet at a split diamond interchange. In addition, the U.S. highway intersects a state highway at the other end of this interchange just ¼ mile farther north, as shown in Figure 5. Together, these three roadways are situated at what is one of the community’s newest and fastest growing commercial and retail shopping areas.

**Roadway and Land Use Characteristics**

The four ramp terminals along the interchange are all signalized, as are the two intersections directly to the east along the local arterial and the intersection of the arterial and the state highway west of the study interchange. The east-west arterial is an at-grade four-lane divided facility, while the U.S. highway is a grade-separated freeway design. The state highway is a four-lane facility divided by a depressed median. Traffic volumes on the north-south U.S. highway are approximately 24,300 vehicles per day (VPD) around the study intersection, while volumes on the east-west arterial range from about 13,400 VPD west of the interchange to approximately 19,000 VPD between the interchange and an intersection with a local minor arterial about ¼ mile farther east. Volumes east of this point increase to about 22,000 VPD. Volumes on this minor arterial are approximately 5,000 VPD to the north of the major arterial and 7,900 VPD to the south. Traffic volumes on the state highway are approximately 8,100 VPD. The U.S. highway has a posted speed limit of 65 mph in this area. The east-west arterial is posted at 45 mph, while the state highway is posted at 50 mph throughout the study area. The local minor arterial and local collector that serve development in this area and intersect the major arterial are both posted at 35 mph. As shown in Figure 5, there are a variety of land uses located within the study area. The uses include several big box retailers, a few gas station/convenience stores, mixed retail, and a number of both sit-down and fast-food restaurants. Besides these commercial uses, the eastern leg of this study area leads to a large residential area.

**Access Characteristics**

Overall, access is well-managed at this study location. The north-south freeway is completely access-controlled, while the state highway is well-managed through the use of medians and minimal access points. The east-west arterial has also been well-managed. To the west of the study intersection, access has been controlled with the use of medians and dedicated left-turn lanes at the ramp terminal, the signalized intersection with the state highway, and an unsignalized minor street access that serves both sides of the roadway approximately 1,000 feet west of the interchange. To the east, access is restricted to signalized intersections and two right-in, right-out only accesses located on the south side of the road approximately 400 and 1,200 feet east of the interchange ramp terminus.
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Figure 5. Case Study 5
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This eastern leg provides access to a significant amount of development both north and south of the roadway. The local minor arterial and collector roadways that intersect this major arterial provide the direct access to the individual businesses and other developments in the area.

Observations

As noted, access is well-managed at this case study location. Positive applications of access management here include

+ Use of grade separation at the intersection of two major roadways;
+ Use of raised and depressed medians throughout the study area to delineate travel lanes and remove most left turns from the through traffic stream;
+ Restriction of all driveway accesses along the U.S. highway and much of the state highway;
+ Limitation of direct driveway accesses along the major arterial and state highway;
+ Use of dedicated left-turn bays at signalized intersections, as well as some minor street accesses, throughout the study area;
+ Alignment of driveways across from each other at full-access (median break) locations;
+ Use of minor supporting roadways and cross access between land uses to provide direct access and to improve internal traffic circulation;

+ Consolidation of access for several businesses into relatively few access points; and
+ Use of continuous two-way left-turn lanes along the minor arterial and collector roadways providing direct access to development.

Although this example is well-managed, there are possible areas of improvement at this location. A negative for this case study, as well as its possible remedy, includes

− Relatively short distance from the interchange to the first signalized intersection on the east leg—relocating the signalized intersection farther east could reduce backup along the major arterial.

Analysis of crashes at this location indicates that the access management techniques utilized appear to have had a positive effect on safety. Traditionally, access-related crashes are rare here. In summary, this case study demonstrates good access management practice. Nonetheless, as with many locations, access management improvements could still be made, especially as traffic volumes increase as development grows.