Case Studies – Case 1

Case 1

Background
The first case study is located at the at-grade intersection of a state highway and a local major arterial roadway in a rapidly growing suburb of one of Iowa's largest metropolitan areas. This location is also within one of the community's largest commercial shopping areas. In addition, this study intersection is less than ¼ mile west of a grade-separated freeway interchange with the aforementioned state highway, as shown in Figure 1.

Roadway and Land Use Characteristics
The crossroads intersection at the center of this case study is signalized. Traffic volumes on the east-west state highway vary between approximately 20,600 vehicles per day (VPD) west of the intersection to nearly 28,000 VPD to the east near the freeway. Volumes on the north-south local arterial vary from approximately 8,400 VPD south of the intersection to nearly double this to the north. Both roadways are four-lane divided facilities, with median breaks at several access points. The east, west, and north legs have a posted speed limit of 35 mph. The speed limit changes to 45 mph along the west leg about ¼ mile from the study intersection. The south leg speed limit is posted at 45 mph. As shown in Figure 1, there are a variety of land uses within the study area. The uses include big box retailers, auto dealerships, a few gas station/convenience stores, and a number of both sit-down and fast-food restaurants. Besides commercial uses, the southwest quadrant of the intersection is largely made up of warehousing and light industrial uses.

Access Characteristics
For the most part, access is well-managed at this study location. The high-volume east leg of the intersection is completely access-controlled as it provides access to and from the southbound lanes of the nearby freeway. South of the intersection, where traffic volumes are relatively low, there are two access points into an auto dealership approximately 400 and 800 feet from the intersection. Four accesses—one located across from the northernmost driveway to the auto dealership, two right-in, right-out accesses located very close together about 600 feet from the intersection, and another located across from the southern driveway to the auto dealership—serve development on the west side of this south leg. To the west, right-in, right-out only access is provided on both the north and south sides of the state highway at approximately 300 and 500 feet from the intersection, with a full unsignalized intersection about 900 feet west of the signalized intersection. The north leg of the case study is the most densely developed, with several businesses in close proximity to the case study intersection. Right-in, right-out only accesses serve both sides of the roadway approximately 400 feet north of the intersection. A full signalized access just 300 feet farther north serves a large portion of the development on both sides of the corridor.

Furthermore, this development utilizes backage roads and cross access between several businesses, as can be seen in Figure 1. Additional right-in, right-out access points are found on the east side of the north leg approximately 950 feet north of the intersection and on the west side just 50 feet farther north.
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Figure 1. Case Study 1
Observations

As previously noted, access is generally well-managed at the first case study location, but both positive and negative observations can be made. Positive applications of access management here include the following:

- Use of raised medians throughout the study area to delineate travel lanes and remove most left turns from the through traffic stream;
- Restriction of all direct driveway accesses along the very high-volume east leg;
- Use of left-turn bays at signalized intersections on the high-volume north and west legs;
- Alignment of driveways across from each other at full-access (median break) locations;
- Consolidation of access for several businesses into relatively few access points; and
- Use of backage roads and cross access between land uses to improve on-site traffic circulation off the main roadways.

Although this case study site is generally well-managed, there are a few possible areas of improvement at this location. Negatives for this case study, as well as possible remedies, include the following:

- Relatively high driveway density on the south leg—driveways on the west side of the road could be eliminated or consolidated and the two auto dealership accesses could be consolidated farther from the intersection;
- Relatively short distance from the study intersection to the first driveways on the west leg—the easternmost driveway on the south side could be relocated farther west or consolidated to provide for better operations of the nearby left-turn bay; and
- Lack of connectivity between development on the northeast quadrant and development directly to the north—cross access (providing direct internal roadway/driveway connections between adjacent parcels) could be provided, eliminating need for traffic using the arterial to access between adjacent, similar developments.

In fact, the city where this case study is located has recently been addressing access issues as this area continues to develop by moving the first driveway on the south side of the west leg farther west and providing new cross access between development in the northeast quadrant and the development directly to the north.

In summary, this case study demonstrates generally good access management practice. In fact, the access management techniques utilized at this location appear to have had a positive effect on safety. When analyzing crash data, it was found that, traditionally, access-related crashes are relatively rare in this area. Nonetheless, as with many locations, access management improvements could still be made, especially as traffic volumes increase with further development.