### Case Studies – Case 4

#### Background

The fourth case study is located around the at-grade intersection of a U.S. highway and a local major arterial in another rapidly growing suburb of a large metropolitan area. This location is also adjacent to a regional amusement park that sees high seasonal traffic volumes, plus the study intersection is less than ¼ mile south of a freeway interchange with the aforementioned U.S. highway, as shown in Figure 4.

#### Roadway and Land Use Characteristics

The interchange ramp terminals north of this intersection are also signalized. Both the north-south highway and east-west arterial are four-lane facilities, with the highway divided by a depressed median. The east-west arterial is a simple four-lane cross-section without turn lanes at and near the study intersection, but approximately ¼ mile east of the study intersection, the arterial is divided by a raised median with left-turn bays. Traffic volumes on the north-south highway vary from approximately 15,100 vehicles per day (VPD) north of the intersection to just under 9,000 VPD to the south. Volumes on the local minor arterial vary from approximately 6,000 VPD on the west leg to nearly 13,000 VPD to the east. Traffic volumes on the freeway range from approximately 50,000 VPD west of the interchange to nearly 36,800 VPD to the east. The east-west arterial has a posted speed limit of 35 mph throughout the study area. The highway is posted at 50 mph south of the signalized intersection, but the speed limit changes to 45 mph to the north as it approaches the freeway interchange. As shown in Figure 4, varieties of land uses have developed and continue to develop around this interchange. These uses include several sit-down and fast-food restaurants, a lumber yard, gas station/convenience stores, a large truck stop, several trucking-related service businesses, and the previously mentioned regional amusement park.

#### Access Characteristics

Access is well-managed along the northern and southern legs of this study location, with this U.S. highway completely access-controlled through the use of medians and restriction of driveways. All access to adjacent land uses is provided from the local major arterial and the supporting roadway network. A total of six accesses are located along the west leg of the arterial within 700 feet of the study intersection. These busy accesses serve the large truck stop, several trucking-related businesses, and a fast-food restaurant. The east leg of the minor arterial also contains numerous access points beginning only about 300 feet from the intersection. There are eleven accesses within the first ¼ mile east of the study intersection, all of which see significant activity during the summer months. As shown in Figure 4, most of these accesses are located along the north side of the roadway and serve several fast-food restaurants, a convenience store, and a motel. In all, four separate drives serve the amusement park along the south side of the roadway.
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Figure 4. Case Study 4
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Observations

This case study demonstrates both good and poor management of access; therefore, both positive and negative observations can be made. Positive applications of access management here include:

+ Use of raised medians on the north and south legs to delineate travel lanes and eliminate left turns;

+ Restriction of all driveway accesses along the north-south highway; and

+ Use of protected left turns and turn lanes at signalized intersections.

As noted above, there are areas of possible improvement at this location. Negatives for this case study, as well as possible remedies, include:

− Relatively high driveway density on the west leg of the local major arterial—driveway accesses to the truck stop and trucking-related businesses could be consolidated. Internal circulation or cross access could be improved to reduce conflicts;

− Relatively short distance from the study intersection to the first driveways on the east leg—the western-most driveways on this leg could be consolidated and aligned to provide for better operations of the nearby intersection;

− High driveway density on the east leg of the minor arterial—the driveways to the businesses on the north side of the road could be consolidated, as could drives to the amusement park along the south side;

− Lack of internal circulation and connectivity between businesses on the north side of the east leg—alternative access ways and cross access could be provided, eliminating the need for traffic using the arterial to access between adjacent developments;

− Lack of left-turn lanes along the east-west arterial—better utilization of minor supporting roadways and/or addition of left-turn lanes or a raised median could reduce conflicts, especially during peak season for the amusement park; and

− Discontinuous access treatments along the east leg—addition of turn lanes or a raised median could provide a more uniform roadway and ultimately reduce conflicts.

An analysis of crashes at this case study location shows a clear difference between the U.S. highway and the local major arterial. While the highway traditionally shows few access-related crashes, analysis of the major arterial clearly indicates access-related safety issues, especially along the east leg. In summary, this case study demonstrates both good and poor access management practice. In general, removal of all access from the north-south highway is a positive measure. Unfortunately, as development has increased in the area, access along the east-west arterial has not been well-managed, especially considering the high volume of left turns in this area. Improvements can and will likely need to be made to improve operations and safety in the future.