DIVERGING DIAMOND INTERCHANGE (DDI) - White Paper

Cobb County DOT, June 2012

A diverging diamond interchange (DDI) is an innovative intersection traffic solution designed to increase capacity, decrease congestion, and minimize cost.

The DDI is designed to ease the flow of heavy traffic by eliminating a left turn signal, and allowing two-directions of traffic to cross the opposite side of the side or cross street at or near the bridge point over the freeway. The design, which has been approved and advocated by the Federal Highway Administration, was listed by Popular Science magazine as one of the best innovations in 2009 in the engineering category in "Best of What's New 2009."

The first DDI was completed in the United States in Springfield, Missouri in 2009. This concept is similar to the concept currently being considered for Wade Green Road at I-75, in northern Cobb County, which would be the first DDI in the County. Recently, the Georgia Department of Transportation (GDOT) opened the first DDI in the state by reconstructing the Ashford-Dunwoody Road and I-285 Interchange.

Figure 1 (below) shows the traffic flow through a DDI freeway interchange. A conventional diamond interchange has left turns from the side street crossing over - or under - a freeway to the freeway on and off ramps. In heavily congested areas, these ramp intersections with the cross street are frequently signalized allowing left turning vehicles onto the on-ramp while also allowing off-ramp vehicles to continue on the side street. All left turning vehicles cross opposing traffic, regardless if it's signalized or non-signalized. These conflict points (crossing opposing traffic) lead to congestion and crashes. For a DDI, traffic on the side street is moved to the opposite side of the road at or near the intersections with the on and off ramps. This 'cross-over' occurs at a simple, two-way signal with no left turns which reduces conflict points. Because the DDI does not have left turns that must clear opposing traffic, the design can improve traffic movement with more green signal time for the side street. Traffic will move faster and safety is increased, resulting in less congestion and fewer crashes.

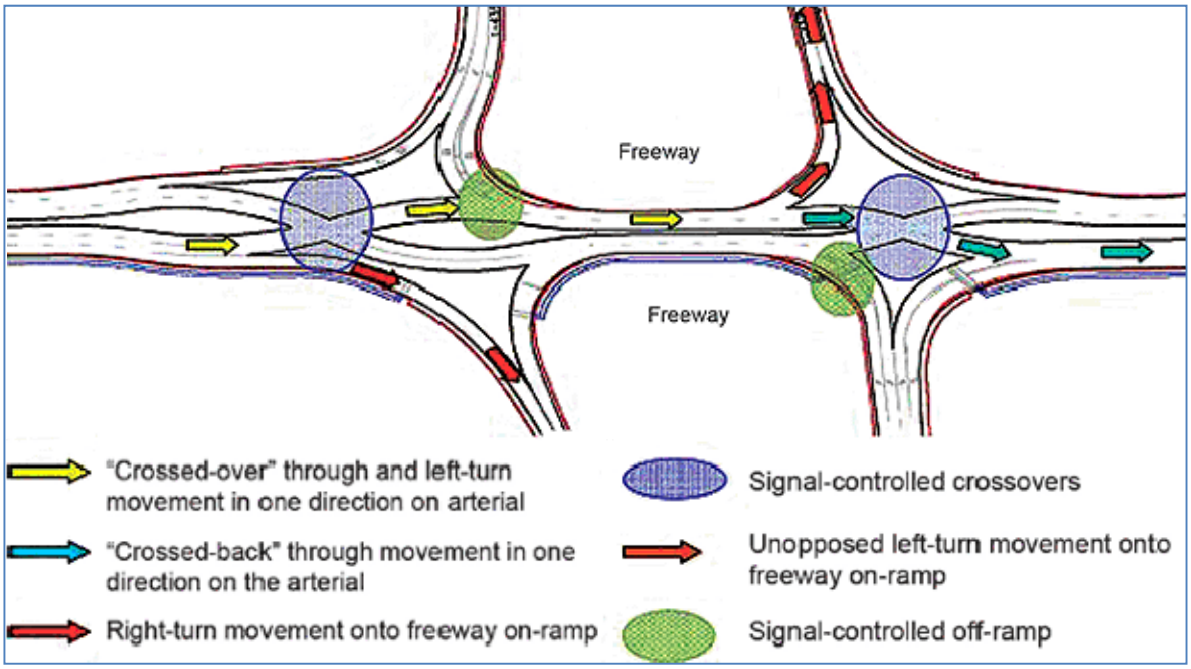

Figure 1. Illustration. Crossover movement in a DDI interchange

Some references in this paper are attributed to Wikipedia at:
http://en.wikipedia.org/wiki/Diverging_diamond_interchange