

# DIVERGING DIAMOND INTERCHANGE

## Description

Freeway-cross street interchanges can take a variety of forms—most commonly in Texas a traditional diamond interchange (an exit ramp before the cross street and entrance ramp to the freeway after it – forming a diamond look from above) and frontage roads. A relatively new concept in the United States is the Diverging Diamond Interchange (DDI) which is designed to efficiently accommodate heavy left-turn movements. The ramp configuration is similar to a traditional diamond interchange. Traffic on the cross street, however, switches sides (moving to the left side of the roadway) before the signalized intersections. By moving traffic to the left, left-turning vehicles can enter the freeway without the need for a left-turn signal phase at the signalized ramp intersections. Also, left-turning vehicles on the cross street do not conflict with opposing through traffic and may turn without stopping.

The Missouri DOT implemented the first DDI in 2009 at the IH 44/Route 13 interchange in Springfield. This project has been successful with significant congestion and safety benefits and positive public perception. Since this first project, several states (Idaho, Indiana, Kansas, Kentucky, Minnesota, North Carolina, Oregon, Tennessee, Virginia, and Utah) have installed DDIs.

## How Will This Help?

- Shorter construction time, typically less than half the time needed for other traditional or innovative interchange types.
- Improves safety because traffic moves more steadily and there are fewer conflict points for intersection crashes.
- Cheaper to build (by 50 percent or more) because of reduced right-of-way and bridge width.



FHWA

<b>Cost:</b>	●●●●○
<b>Time:</b>	<b>Moderate</b>
<b>Impact:</b>	<b>Spot</b>
<b>Who:</b>	<b>State</b>
<b>Hurdles:</b>	<b>New Concept</b>

## Success Stories

- The Springfield, Missouri, DDI eliminated the typical one-mile daily AM and PM and two- to three-mile weekend and holiday backups with the traditional diamond design and reduced total crashes by 46 percent during the first year of operation.
- Public perception polling showed that a very high percentage (87 percent) felt safer and also expressed that larger vehicles and pedestrian/bicycle movements were better or similar to a standard diamond (80 percent).

## Implementation Issues

DDIs are a new and unfamiliar type of interchange, creating one of the key implementation issues. Since motorists drive on the left side of the road, the interchange may initially confuse some and may not readily be embraced by the public. However, an aggressive public information campaign along with appropriate signage, marketing, and education could minimize this issue.