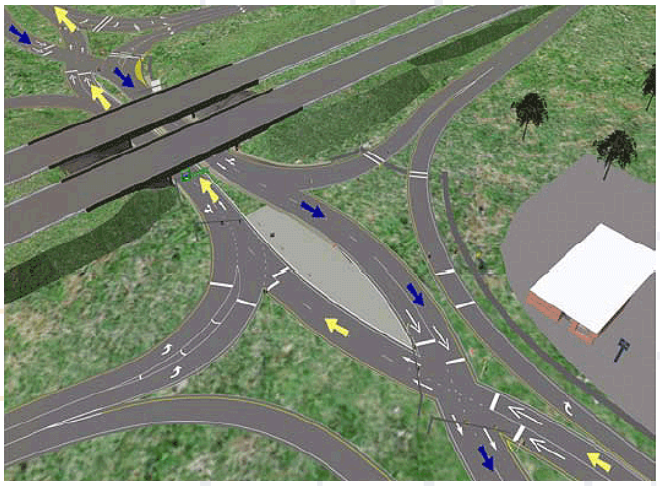
State Transportation Innovation Council (STIC)

2015 Fact Sheet

Diverging Diamond Interchange

Complex Design is Easily Navigable

A diverging diamond interchange (DDI), also referred to as a double crossover diamond, combines the motions of left-turning and through traffic to create crossover sections at ramp terminals. This design originated in France where it has been implemented for approximately 30 years. Several DDIs exist in the United States, the first one having opened in Missouri in 2009. Diverging diamonds provide a number of safety benefits for drivers as well as pedestrians who will have access to sidewalks and a walkway located at the center of the bridge protected by concrete barriers.



Graphic source: FHWA

How do DDIs work?

Although the unique geometric design of the DDI may appear complex, users find it easily navigable. Drivers pass through the first traffic signal and travel to the opposite side of the interchange where they can easily access the unopposed left turn movement onto the freeway on-ramp. Drivers who do not access this ramp will be returned to the other side of the interchange through the next traffic signal. Signal controlled off-ramps are another feature that allow for safer merging into interchange traffic.

What are the benefits?

- Reduces travel delays and increases throughput.
- Reduces vehicle-to-vehicle conflict points from 26—as in a conventional diamond interchange—to 14 points.
- Reduces speed.
- Simplifies operation of intersections and turns on and off ramps.

Pennsylvania's State Transportation Innovation Council (STIC) has selected diverging diamond interchanges (DDI) as an innovative technology for improving travel efficiency and reducing delays. The Federal Highway Administration also advocates the use of DDI as a means to promote intersection safety while meeting the often conflicting demands for increasing capacity, decreasing congestion, and minimizing the cost of new infrastructure.

A diverging diamond interchange at Interstate 44 and the Kansas Expressway in Springfield, Missouri. The success of this interchange, completed in 2009, has spurred projects in other states where it is viewed as a possible cost-effective transportation solution.

Photo: Cathy Morrison, MoDOT

What does the future hold?

One DDI is currently under way in Washington County. PennDOT regularly considers DDIs for major interchange reconstruction projects throughout the state and expects to have more under design in the near future.

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