

## INFO More Information on Diverging Diamonds

[◀ Homepage](#)

[When Will this Project be Built? ▶](#)

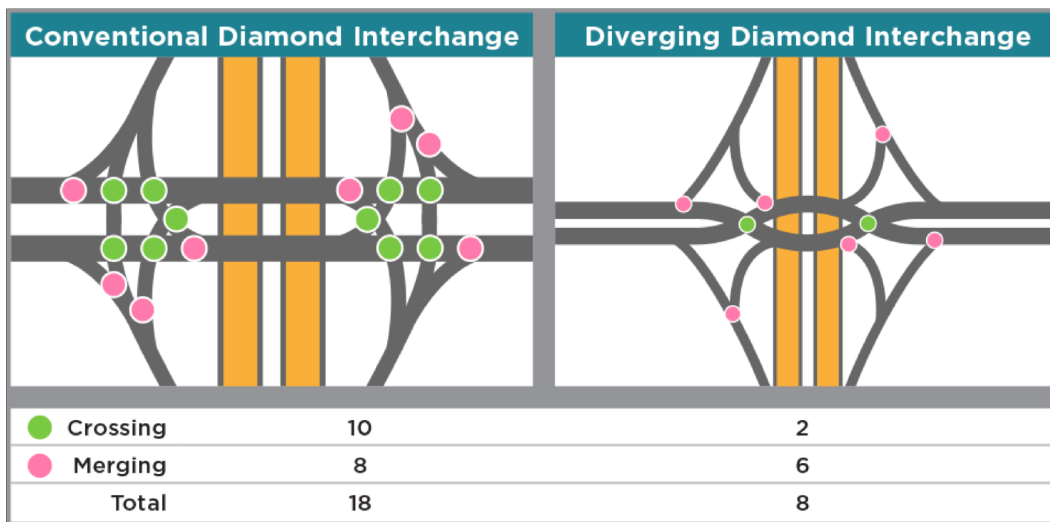
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The first Diverging Diamond Interchange (DDI) in the United States opened in Missouri in 2009. There are now more than 200 interchanges of this type across the country. DDIs can reduce the number and severity of collisions compared to a traditional diamond, and reduce traffic congestion. Vehicles traveling through the DDI cross over to the opposite side of the roadway so that left turns no longer cross the path of oncoming traffic. While crossing to the opposite side of the road may sound confusing, vehicles are guided through the interchange via use of channelized islands and signing and striping enhancements on the roadway make the routes very clear for drivers to get accustomed to the new design. Removing left turns from the traffic signals greatly increases the number of vehicles that can pass through the signal during a cycle.

DDIs have been shown to improve safety as well as traffic flow. A conventional diamond interchange has 18 conflict points, or locations where collisions can occur. A DDI reduces this to 8.

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Conflict Point Comparison



The original DDI constructed in Springfield, MO reduced collisions by 60% over five months. A survey done by the Missouri DOT shows that 97% of drivers feel safer using the new DDI. Daily traffic backups that were up to a mile long were completely eliminated after the DDI was completed.

Please refer to <https://divergingdiamond.com> for more information.

ODOT recently completed the state's first DDI at I-40 and SH-6 in Elk City. Please view the video below to learn more about Oklahoma's first DDI.



01:24

Some additional information and videos from the Federal Highway Administration are available here:

- FHWA DDI info pamphlet (Revised July 2020):

## A TIMELY, COST-EFFECTIVE SOLUTION

A DDI can cost less – in some cases as much as 75 percent less – than an equivalent conventional diamond or single point urban interchange.<sup>4</sup> DDIs often require fewer lanes than a conventional design to handle the same amount of traffic. A smaller project footprint means less right-of-way is needed, resulting in fewer impacts to adjacent areas. All of this makes a DDI alternative cheaper, easier, and quicker to construct.

## INTEGRATING ALL USERS

The benefits of a DDI are not limited to just vehicle traffic – safe and convenient pedestrian walkways and crossings are important components of any well-designed interchange. At a DDI, pedestrian walkways are located either through the median or along the sides of the crossroad, while bicycle lanes are placed in the customary location to the right of traffic. Crosswalks are simpler and involve crossing fewer lanes at a time.

Given the importance of freight movement through interchanges, a DDI also is designed to accommodate large commercial vehicles. The



Center Pedestrian Refuge, Springfield, MO DDI  
Source: DDI Video FHWA-SA-14-019

ability of trucks to turn on to and off of the ramps and navigate along the crossroad is not inhibited with a DDI. In surveys of commercial drivers using the Springfield (Missouri) DDI, 83 percent of respondents felt that maneuvering a large truck through the interchange was easy and no different from other interchange types.<sup>5</sup>



Trucks Using a DDI in Salt Lake County, UT  
Source: DDI Video FHWA-SA-14-019

## SOURCES

<sup>1</sup> FHWA, *Techbrief: Double Crossover Diamond Interchange*, FHWA-HRT-09-054 (Washington, DC, 2009). Available at: <https://www.fhwa.dot.gov/publications/research/safety/09054/index.cfm>

<sup>2</sup> Missouri DOT, *Diverging Diamond Interchange Performance Evaluation (I-44 and Route 13)*, OR11-012 (2011). Available at: <https://ntrlrepository.bib.cora.windows.net/lib/36000/36000/36038/or11012.pdf>

<sup>3</sup> Praveen Edara, Joe Bared, and Ram Jagannathan, "Diverging Diamond Interchange and Double Crossover Intersection – Vehicle and Pedestrian Performance," *Transportation Research Record* 1912 (2005):31-38

<sup>4</sup> The Official Website of the DDI - "A Diamond Interchange With a Twist." Available at: <https://divergingdiamond.com/>

<sup>5</sup> Missouri DOT, *Diverging Diamond Interchange Performance Evaluation (I-44 and Route 13)*, OR11-012 (2011). Available at: <https://ntrl.trb.org/view/1098716>

## CONTACT

Jeffrey Shaw, P.E.  
FHWA Office of Safety  
202.738.7793  
[jeffrey.shaw@dot.gov](mailto:jeffrey.shaw@dot.gov)

Mark Doctor, P.E.  
FHWA Resource Center  
404.895.6210  
[mark.doctor@dot.gov](mailto:mark.doctor@dot.gov)

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## DIVERGING DIAMOND INTERCHANGE



Author: DOT  
Source: Google Earth

AN INNOVATIVE,  
PROVEN SOLUTION FOR  
IMPROVING SAFETY AND  
MOBILITY AT INTERCHANGES

U.S. Department of Transportation  
Federal Highway Administration

Safe Roads for a Safer Future  
Investment in roadway safety saves lives  
<http://safety.fhwa.dot.gov>

- [Alternative Intersections: Diverging Diamond Interchange - YouTube](#)
- [DDI Case Study – I-44 & SR13 in Springfield \(Missouri\) - YouTube](#)