

# Reduced Conflict Intersections

Over the past several years, the Indiana Department of Transportation (INDOT) has been incorporating Reduced Conflict Intersections (RCIs) as an alternative to traditional intersections on high-speed, four-lane divided highways.

Instead of vehicles crossing fast-moving lanes of mainline traffic to go straight or turn left, as in traditional intersections, motorists on secondary roads at RCIs turn right in the same direction of traffic, merge into the left lane, and then make a U-turn in the direction they intend to travel. An otherwise complex and risky maneuver is made more efficient by breaking up the driver's trip through the intersection into a series of simple, distinct movements.

Although motorists have to travel slightly farther to get where they want to go, navigating an RCI often requires less time than waiting at a traditional intersection for a safe gap in traffic.

INDOT policy is to use alternative intersections, including RCIs, where appropriate to support its ongoing commitment to improve safety and service delivery through innovation and cost-effective investments.

## Benefits of RCIs

### Reduced Conflict Intersections are much safer.

RCIs greatly reduce — or even eliminate — a significant number of severe crashes that occur when vehicles cross over busy, high-speed traffic lanes to reach other lanes or roads.

Reduced Conflict Intersections are safer alternatives to traditional roadway intersections on four-lane highways with certain traffic and site conditions because they eliminate or substantially reduce right-angle crashes, the type most responsible for fatalities and serious injuries at traditional intersections.

RCIs eliminate the need for vehicles on secondary roads to cross high-speed mainline lanes of traffic in a single, complex maneuver. Multiple research studies, including those from the National Cooperative Highway Research Program, show that RCIs provide a significant reduction in right-angle crashes.

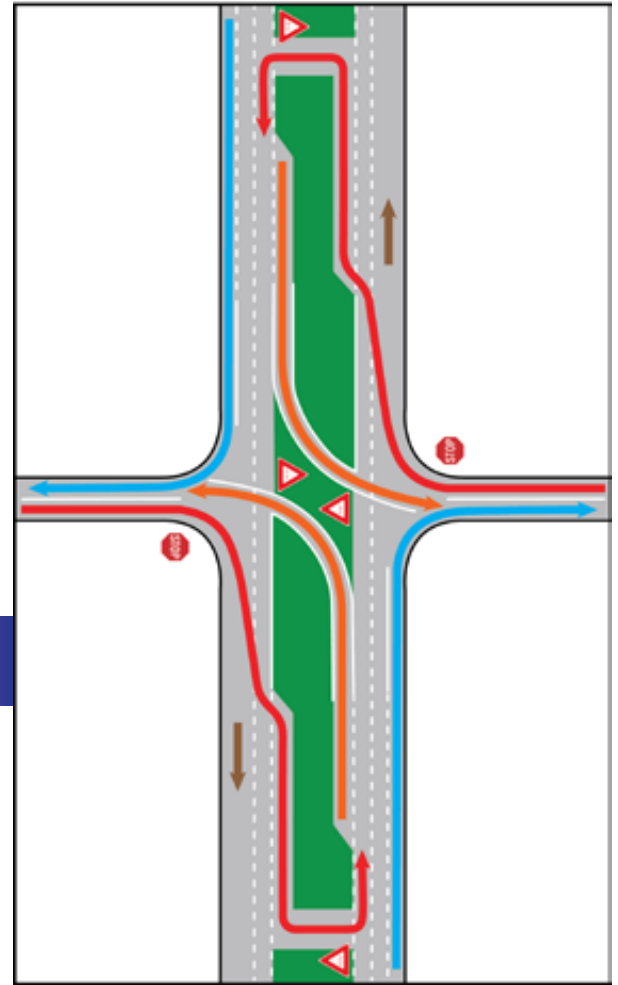
Nationwide statistics show a more than 50% decline in crashes where RCIs are installed. Fatal crashes decline by as much as 85%.

RCIs installed at stop-controlled four-lane highway intersections across Indiana and the nation have shown a substantial decrease in fatal and serious injury crashes.

### RCIs reduce the potential for crashes.

In a traditional intersection, there are 42 different conflict points where a vehicle crash can occur. Serious crashes, such as T-bone or right-angle crashes, can occur at 24 of those 42 conflict points. A Reduced Conflict Intersection can have no more than 29 possible conflict points, and some RCIs can be designed so that there are zero crossing conflict points.

Reduced Conflict Intersection



### RCIs provide for safer vehicle acceleration and deceleration.

In the RCI design, drivers turn right in the same direction of traffic, and merge safely into the left lane to make a U-turn in the direction they intend to travel.

RCIs use an extended deceleration left-turn lane, which enables vehicles making a U-turn to safely pull off the main line, out of the way of high-speed through traffic. RCIs also may include acceleration lanes, which enables U-turning vehicles to gain speed before merging into high-speed through traffic lanes.

# RCIs Can Accommodate Large Vehicles

Reduced Conflict Intersections are designed to fully accommodate the wide-turning radius of semitrailer trucks and other large vehicles, such as school buses or farm equipment.

Where road and median width is not sufficient to accommodate larger vehicles, an additional pavement area is added. Special provisions are also made for police, fire trucks, and other emergency vehicles to cross the intersection without making U-turns.

## Indiana's RCI Experience

Since 2015, INDOT has installed seven RCIs at four-lane highway intersections in Indiana. These intersections have shown a substantial decrease in fatal and injury crashes since RCI installation.

INDOT has conducted performance analyses of crashes at each RCI, comparing pre-construction crash frequency and severity with post-construction data over similar time periods, ranging from 1½ to 5 years.

In overall effectiveness, INDOT's analysis showed that the seven RCIs:

- Reduced fatal and injury crashes by an average of 81%.
- Reduced property-damage crashes by an average of 58%.
- Reduced crashes of any severity by an average of 68%.

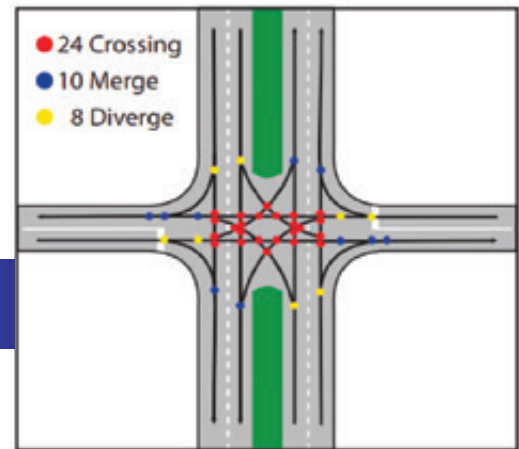
INDOT's analysis showed a dramatic reduction in fatal and injury vehicle crashes at each RCI:

- Fatal and injury crashes at each intersection declined between 64% and 100%.
- Property-damage crashes at each intersection ranged from No Change to 100% reduction.
- All crashes of any severity at each intersection declined between 38% and 100%.

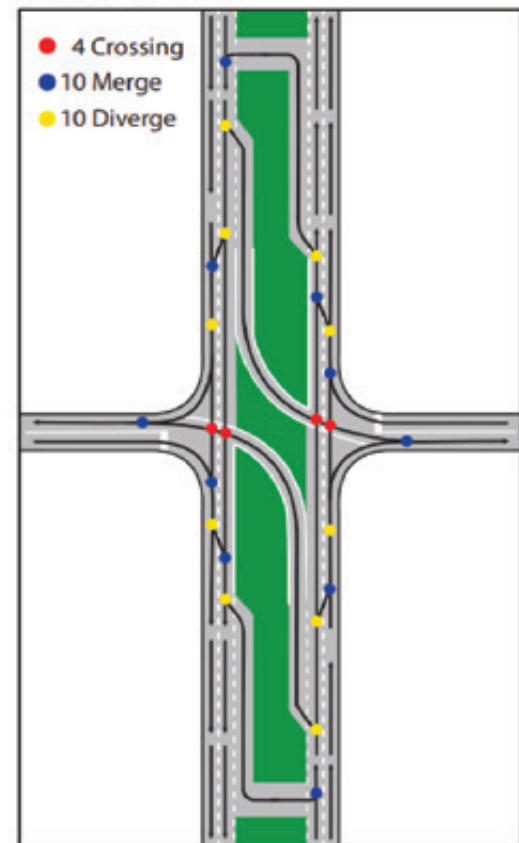
A RCI is one of many countermeasures available to improve intersection safety performance. Presence of specific traffic and site conditions favor their installation; they are not an appropriate treatment in all cases, and most often not the first intervention that will be installed. However, when conditions are right, they've demonstrated extraordinary effectiveness at keeping people safe.

INDOT continues to track the safety performance of these and future RCIs to assess their effectiveness and advance our understanding of the traffic levels, design, and site conditions most suitable for this highway feature.

Conventional Intersection Conflict Points



RCI Conflict Points



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