In 2009, there were more than 17,000 reported fatal crashes in rural areas of United States which accounted 56 percent of total fatal crashes. This number has not declined in a significant amount since 2009. Studies are undergoing on these rural area roadways, including intersections, to identify the major causes and take the necessary countermeasure. By using previous intersection related fatal and injury crash data, it is possible to identify high-risk intersections to point out and make the appropriate improvement. Five year fatal and injury crash data was collected (2008-2012) for three Indiana rural counties that had the highest frequency of fatal and injury crashes. After collecting the data, intersection related crashes were identified and analyzed. The analysis was used to identify high-risk intersections and to help recommend proper countermeasures to improve these intersections. The results obtained allowed the research team to compare crash data from various counties. Besides that, proper countermeasures, such as enhancing signs and pavement markings, installing transverse rumble strips, and realigning skewed intersections, were also recommended to increase road safety in each county. The recommended countermeasures are going to be vital alongside findings from other undergoing road safety researches, such as on horizontal curves and vertical curves, to increase roadway safety in rural areas.