

# CARMEL, INDIANA

by Michael T. McBride, city of Carmel, Ind.

## Roundabout Interchange Corridor Complete...Almost.



*Carmel, Ind., has dramatically improved east-west connectivity with the use of a series of teardrop interchanges. All photos: American Structurepoint Inc.*

In 1998, the city of Carmel, Ind., began its aggressive and innovative efforts to develop the Midwest's first roundabout interchange-dependent, free flowing expressway. The expressway had been 5 miles of congestion-plagued Indiana State Road (SR) 431, a four-lane, 50,000 vehicles per day, limited access highway dividing the community in half. SR 431 through Carmel was producing significant traffic delays at all eight of its at-grade signalized intersections. Making matters worse, Carmel's police department was responding to more than 200 accidents each year at the corridor's intersections, many of which involved injury and several even resulted in deaths.

When Carmel was finally successful in convincing the Indiana Department of Transportation (INDOT) to relinquish SR 431 to the city, the city not only changed the name to Keystone Parkway, it also began a more than \$100 million investment in the corridor. Although improving efficiency of flow through Carmel on Keystone Parkway was important, the city's primary impetus in the proposed project was to improve east-west community connectivity across the Keystone corridor. For years, the signalized intersections had been daunting places for automobiles to pass and downright frightening places for pedestrians.

*The teardrop interchanges have greatly reduced traffic congestion and improved safety for motorists and pedestrians.*

Carmel's transformation would have to be swift. The agreement, signed in October of 2007, relinquishing control of the roadway to Carmel, required that the city have six of the eight intersection improvements complete prior to 2011 when INDOT planned to begin the reconstruction of a parallel route, U.S. Highway 31. From conception to completion, the city would have only 3 years to transform the Keystone Corridor and have it ready to accept detour traffic during the U.S. 31 construction.

The city's plan for the roadway was to convert seven of the eight signalized intersections to teardrop roundabout interchanges. Keystone would have to be depressed through each intersection, in some cases as much as 20 ft, in

order to avoid building retaining walls above existing grade and creating a visual barrier east to west. The bridges carrying each east-west street would be constructed over the top. The bridges would also accommodate the very compact twin teardrop roundabouts that would control the Keystone ramp terminal traffic.

Construction began in May 2008 on the first two interchanges. Two additional interchanges were completed each year through 2010. By October 1, 2010, all six interchanges were fully operational. The original anticipated project budget of \$112 million resulted with a total final project cost of approximately \$108 million.

The use of concrete was critical to meeting the project purpose, budget, and schedule. Precast, prestressed concrete allowed accelerated, all-weather construction and the aesthetic appeal and long-term durability that the project required.

*Michael T. McBride is the city engineer for the city of Carmel, Ind.*

### EDITOR'S NOTE

*In May 2011, nearly 400 engineers from around the world gathered in Carmel, Ind., population 79,000, to attend the seventh annual International Conference on Roundabouts. Carmel has begun work on its 69th roundabout and will build three others this summer. You can read more about the Keystone Parkway interchanges in the Fall 2010 issue of ASPIRE,™ page 24.*

