



US 17 Corridor, Wilmington, NC

RESTRICTED CROSSING U-TURN INTERSECTION

THE PROBLEM

Conventional intersections along a major access route in coastal North Carolina were operating at maximum capacity, unable to support the mobility, safety, and economic development needs of the region.

THE SOLUTION

A series of six Restricted Crossing U-Turn intersections along a major regional arterial highway.

THE OUTCOME

- Expected reductions in travel time — 25 percent during peak hours and 20 percent overall.
- Expected reductions in crashes — an average of 46 percent in total crashes and an average of 63 percent in injury crashes.
- Innovative design solution funded with private investment in the form of a public private partnership between NCDOT and regional developers.

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CORRIDOR LOCATION

34°12'49.88"N, 78°1'22.16"W

Background

A four-lane divided expressway, US 17 is located near the coastline south of Wilmington, North Carolina. A major north-south highway, US 17 provides access to over 40 named beaches, the Hatteras National Seashore, and the Pea Island National Wildlife Refuge in addition to serving key military bases, ports, and shopping centers. North Carolina DOT (NCDOT) has identified US 17 as one of the state's Strategic Highway Corridors.

Challenges

US 17 was a road with no signals and an average daily traffic (ADT) volume of about 28,000.¹ Developers were planning to build a discount super store and a large shopping center, spurring residential and economic growth in the area. However, the existing conventional intersections along the corridor near Wilmington and Leland already operated at capacity. They could not meet the mobility, safety, and economic development expectations of the region.

Approach

Local developers shared NCDOT's interest in improving and enhancing area roadways, so they formed a public-private partnership. Their combined resources allowed the installation of a series of six Restricted Crossing U-Turn (RCUT) intersections along US 17. Also known as Superstreets, these intersections were capable of handling nearly twice as much traffic as the original, conventional alternatives.

"I would consider this the perfect application of the [RCUT]. You have a strategic highway corridor carrying a lot of traffic, major developers ... adding a lot of traffic, developers looking at a grade-separated solution ... and then the [RCUT] comes in and accomplishes similar level of service ... at a fraction of the cost."

— Bastian Schroeder, Ph.D., P.E.
Assistant Director, Highway Systems, ITRE, NC State University



Vehicle Turning at an RCUT Intersection Along US 17 in NC
Source: RCUT Video FHWA-SA-14-020

Results

Users are realizing safety and mobility benefits on the entire corridor. At the Wilmington intersection, drivers are moving through the main intersection 20 percent faster than before, even though ADT has increased to more than 42,000. Simulations of the whole corridor show a 25 percent decrease in travel times during peak hours. A study of North Carolina RCUT intersections shows average decreases of 46 percent in total crashes and 63 percent in injury crashes due to the RCUT design.²

¹ North Carolina Department of Transportation, "2011 Annual Average Daily Traffic, Generated by the Traffic Survey Group, Transportation Planning Branch, Raleigh, Included in Wake County North Carolina." Available at: https://xfer.services.ncdot.gov/imgdot/DOTT-SUMaps/AADT_URBANS/RALEIGH_URBAN/2011/Sheet3.pdf

² R. L. Haley, "Operational Effects of Signalized Superstreets in North Carolina," (MS thesis, North Carolina State University, 2010). Available at: <http://repository.lib.ncsu.edu/bitstream/1840.16/6112/1/etd.pdf>

