



## **NORTH CAROLINA** Department of Transportation



**Transylvania County TAC**

Brevard, NC

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# Access Management Strategies

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NCDOT Congestion Management Section

# Access Management Strategies

- Access Management
- Medians vs. Center Turn Lanes
- Superstreets
- Roundabouts



# Are there other alternatives to traffic signals for busy at-grade intersections?





# Modern Roundabouts!



Clemmons, Forsyth Co.

NC State, Raleigh





# Modern Roundabouts!



Roundabout – 45-60 degree entry



Roundabout - Yield



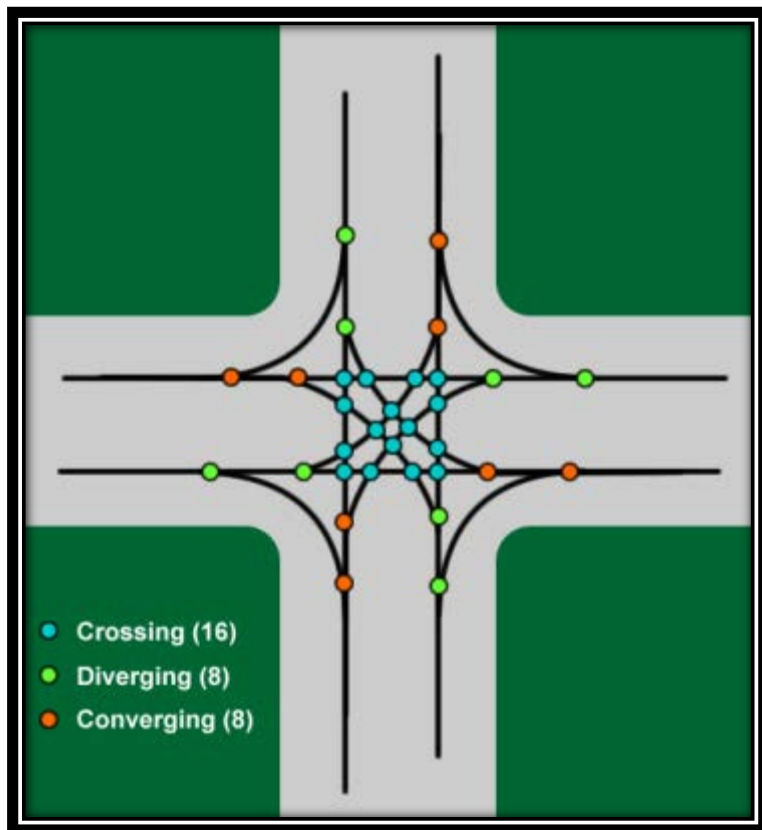
# Why Roundabouts?

- Safest Intersection
- High Capacity / Low Delay
- Good for All Modes of Traffic
- Geometric Flexibility
- Aesthetics

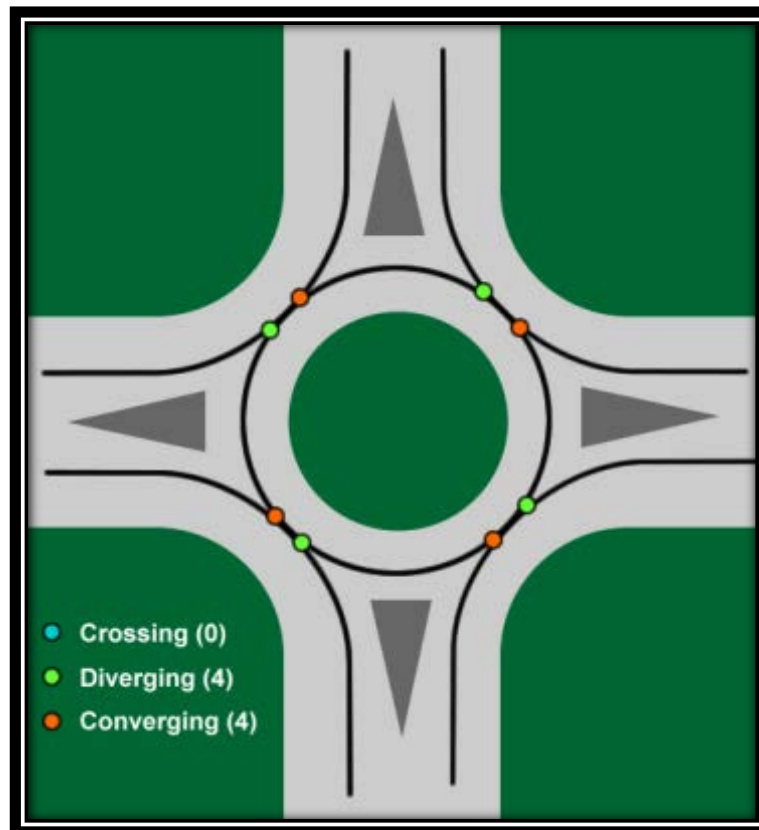




# Roundabouts - Safety



There are 32 conflict points at a conventional intersection.



There are only 8 conflict points at a modern roundabout



# Roundabouts – Safety Crash Reductions Following Installation of Roundabouts

In the United States – 2007

- Total Crashes 48%
- Fatal/Injury Crashes in Rural Areas 78%
- Fatal/Injury Crashes in Urban Areas 60%

In North Carolina from 1999-2006

- Conversion From Stop Sign Control 41%
- Conversion From Signal Control 74%

Sources:

Insurance Institute For Highway Safety [www.highwaysafety.org](http://www.highwaysafety.org)

NCHRP Report 572 [onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_572.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_572.pdf)

NCDOT Safety Evaluation Group [www.ncdot.org/doh/preconstruct/traffic/safety/Reports/completed.html](http://www.ncdot.org/doh/preconstruct/traffic/safety/Reports/completed.html)





# Roundabouts – Capacity and Operation

- Peak Hour Traffic – Usually at least as efficient (same overall delay to drivers) as traffic signals or all-way stops
- Off Peak Traffic – Usually much more efficient than traffic signals.
- Multi-lane roundabouts can handle as much traffic as a busy signalized intersection



# Roundabouts – Multi-Modal

- Roundabouts provide a safer crossing for pedestrians and cyclists





# Roundabouts – Multi-Modal

- Buses do not have trouble negotiating the roundabout, and provide a good location for bus stops





# Roundabouts – Geometric Flexibility





# Landscaping





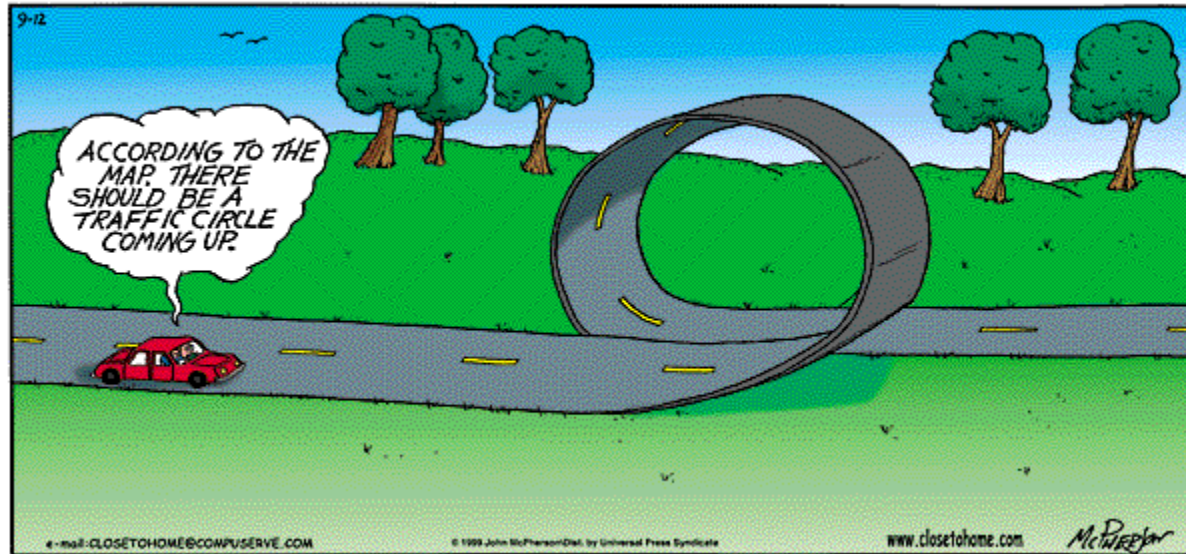
# Common Concerns

When a roundabout is recommended for an intersection there typically is some public resistance. Some of the complaints and questions we frequently hear/deal with:

- Driver Expectation
- Large Trucks
- Cost and Maintenance
- Emergency Vehicle Access



# Driver Expectations





# Large Trucks







# Emergency Vehicles





# Typical Intersection Costs

- Average single lane roundabout construction costs about **\$600,000**
- Maintenance is minimal (mostly mowing any additional landscaping is done by others)
- Signalized intersection costs are about **\$100,000**
- Signal maintenance costs are about **\$3,000-5,000** annually
- Construction of turn lanes is about **\$75,000-\$150,000**

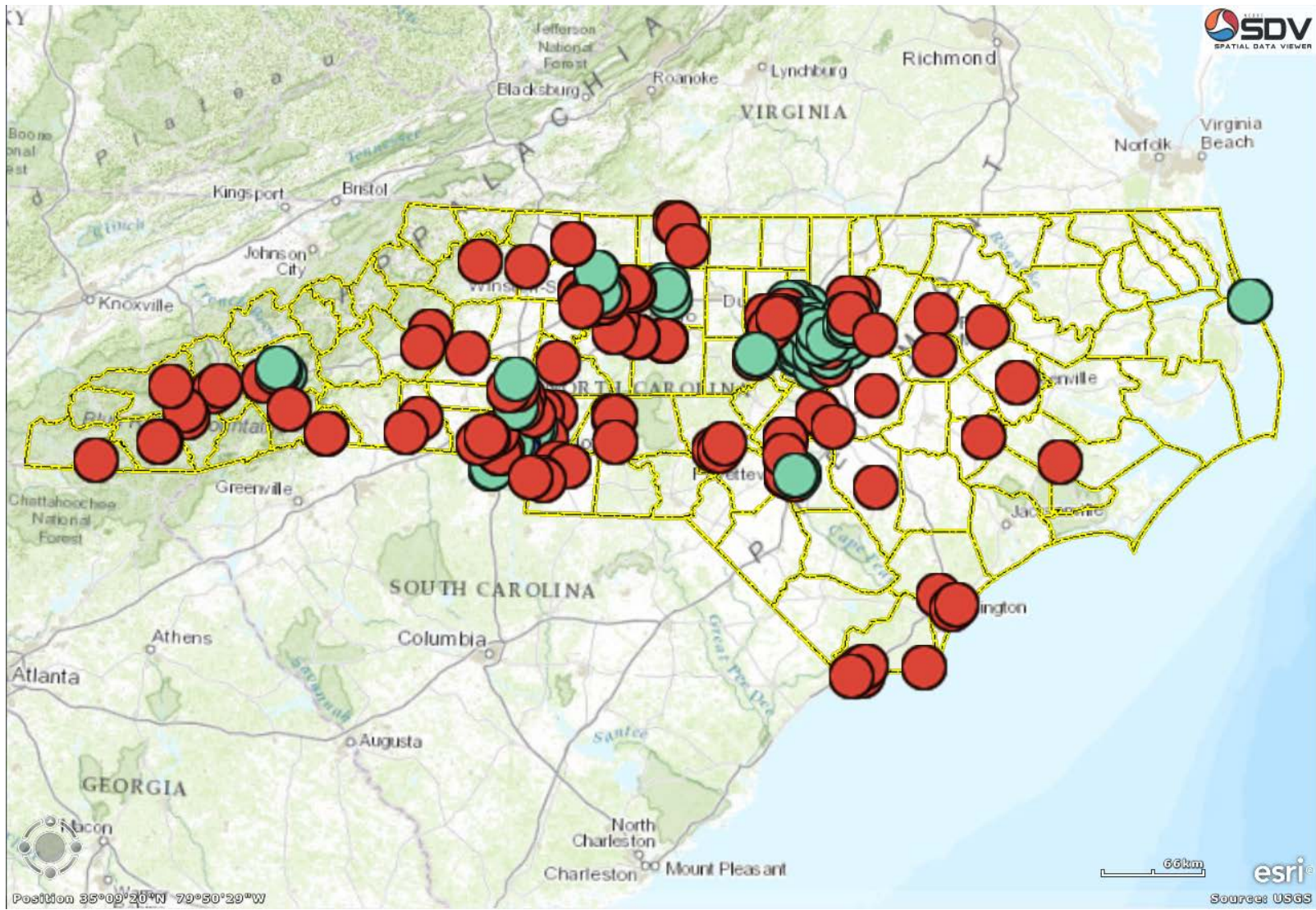


# North Carolina Roundabout Trends

- There are about 250 roundabouts in the State, over half on the State road system
- The majority of the roundabouts in the State are single lane with four approaches
- Multilane roundabouts are becoming more acceptable
- Downtown areas
- Interchange ramps
- Each of the State's 14 Transportation Divisions has at least one roundabout in operation



# North Carolina Roundabouts





# Single Lane Roundabouts in NC





# Single Lane Roundabouts in NC



NC State, Raleigh



# Multi-Lane Roundabouts in NC



Old Salem – Main St. at Salem St.



# Multi-Lane Roundabouts in NC



Weddington, NC





# Multi-Lane Roundabouts in NC



Downtown  
Winston-Salem



# Multi-Lane Roundabouts in NC



# Questions?



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