VIRGINIA CONCRETE INTERSECTIONS –

GET IN, GET OUT, STAY OUT

2019 Virginia Concrete Conference

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Why Concrete for Intersections?

- Non-deforming surface
- No softening from oil drippings
- Durable skid resistance
- Good light reflectivity
- Long service life
- Low-maintenance
Do you see a difference?
Shorter Stopping Distance

- Dry / Smooth
- Wet / Smooth
- Wet / Rutted

Stopping Distance (ft.):
- Concrete
- Asphalt

120 ft = 6 car lengths
Asphalt Pavements @ Intersections w/ heavy trucks

- Rutting & Shoving
- Potholes
- Frequent Overlays & Repair
- Low Nighttime Visibility
- High Annual Maintenance Costs
Concrete can be a more durable option @ intersections

- Does not rut & shove under heavy trucks
- Low annual maintenance costs
- Minimal repairs
- Minimize user inconvenience
- Long service life
Considerations for Concrete Intersections

- Pavement Design
- Materials
- Traffic Management
- Constructability
- Jointing
- Opening to Traffic
Route 28 at Manassas Drive

Project 0028-152-F01, C-501
PPMS 9573

in conjunction with

Project 0028-076-V11, C-501
PPMS 13524
Project Description

• City of Manassas Park (NOVA District)

• Major Road is Route 28 Centerville Road.
  • 1998 ADT 50,325; 2018 ADT 74,000; 8% trucks.

• Minor Road is Manassas Drive.
  • High volume turning movements.
  • Manassas South on Manassas Drive is an Industrial Park, High School and Commuter rail facility.
Project Background

• Originally set up for asphalt concrete construction.

• Chose this high volume intersection to evaluate using concrete.

• Joint detail and MOT added.

• At the preconstruction meeting, goal was set to build award-winning project.

• Good inspection and construction.
Route 28 / Manassas Dr.
Portland Cement Concrete Pavement
Joint Details

Typical Transverse joint spacing shall be 15 ft. Joints elsewhere shown on these plans or as approved by the Engineer. All longitudinal joints shall be field and all transverse joints shall be dowelled unless otherwise noted or approved by the Engineer.

All joints (Transverse and Longitudinal) in this area shall be keyed joints. No fillers or doweled shall be used.

The ends of the concrete slabs shall be mitered to 45° with a minimum 6" over all at the intersections to approach Manassas Dr. and Manassas Dr. Intersection.

See DCP-AVE for additional construction details.
Route 28 Under Construction
What about now?
• No pictures...........but.........

• “Route 28 in Manassas has performed exceptionally well, is still in service and is performing very well.

• “The key to success was the superintendent took exceptional pride in his work and did everything in accordance with our specifications”.

• "Build it right and it will last".
Route 460 in Windsor
Route 460 in Windsor

• Work originally done by the Area Headquarters in 1981

• Tapered section lead to some failures

• Led to a contract in 1989
  • Both sides completed in 2 weeks (Mon. – Thurs.)
  • Drainage was not well addressed

• Most recent contract work done in 2011
What about now?
Route 460 in Windsor

- WB lane in good condition, rough ride in places

- EB lane in fair condition, some patching/rough ride

- Some potential deflection
  - Drainage problems may still be an issue (very flat area, difficult to drain/outfall)
Route 30 in Doswell

In front of the Kings Dominion theme park & 2 truck stops
Route 30 at Doswell

- Selected as a site to evaluate due to constant maintenance requirements (about every 2-3 years)
- Completed in March 1996
- No maintenance since then
- Did encounter some problems and suggested improvements were developed
Route 30 – Suggested Improvements

- Require existing pavement removal with milling machine
- Require trial batches at the beginning and with any changes in materials
- Use a fixed day contract or some other means to minimize impact on traffic
- Beef up the curing requirements
- Encourage early joint saw cutting
What about now?
• Concrete is still the riding surface for all lanes

• The concrete lane has performed very well, under severe, slow-moving & turning movement loading from tractor-trailers.
Route 1 in Dinwiddie
Route 1, Dinwiddie Co.

• With the addition of a steel manufacturing facility, the existing roadway needed to be improved to handle the anticipated truck traffic, especially for traffic turning off Route 1.

• Residency chose reconstruction with concrete for the turn lane.
What about now?
• Concrete is still the riding surface for the turn lane (though hard to see in the latest pictures)

• The concrete turn lane has performed very well.
Carmel Church Interim Ramp Improvement

I-95 and Route 207 Interchange
The Problem(s)

- Exit 104 on I-95 NB off ramp to SR 207 services truck stops on three of the four corners of the interchange.

- The ramps designed for 1960s traffic cannot efficiently handle the current truck traffic now imposed in this area.

- There is a long-range plan for reconstruction, but an interim fix was needed.
Proposed Solution

• L&D was given the project to design an interim interstate off-ramp, with traffic storage capacity that will work until the ultimate interchange could be built.

• The design of the off ramp is to widen the left side of the off ramp and build a turn lane for westbound route 207.

• Designated a lane on the ramp before Route 207 for northbound Route 652.

• Route 207 will have a 950-foot turn lane built with a raised median for traffic going to Route 652 N.
Proposed Solution…

• Pave the extended turn lane on Route 207 with portland cement concrete.

• A 24-hour concrete mix and a paving design that meets VDOT’s standards has been put together.

• The contract states that the Route 207 turn lane for Route 652 will be not be closed of more than 14 days.
What about now?
• Concrete is still the riding surface for the left turn lane

• The concrete lane has performed very well, under severe, slow-moving & turning movement loading from tractor-trailers.