

VIRGINIA CONCRETE INTERSECTIONS – GET IN, GET OUT, STAY OUT

2019 Virginia Concrete Conference

March 1, 2019

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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**



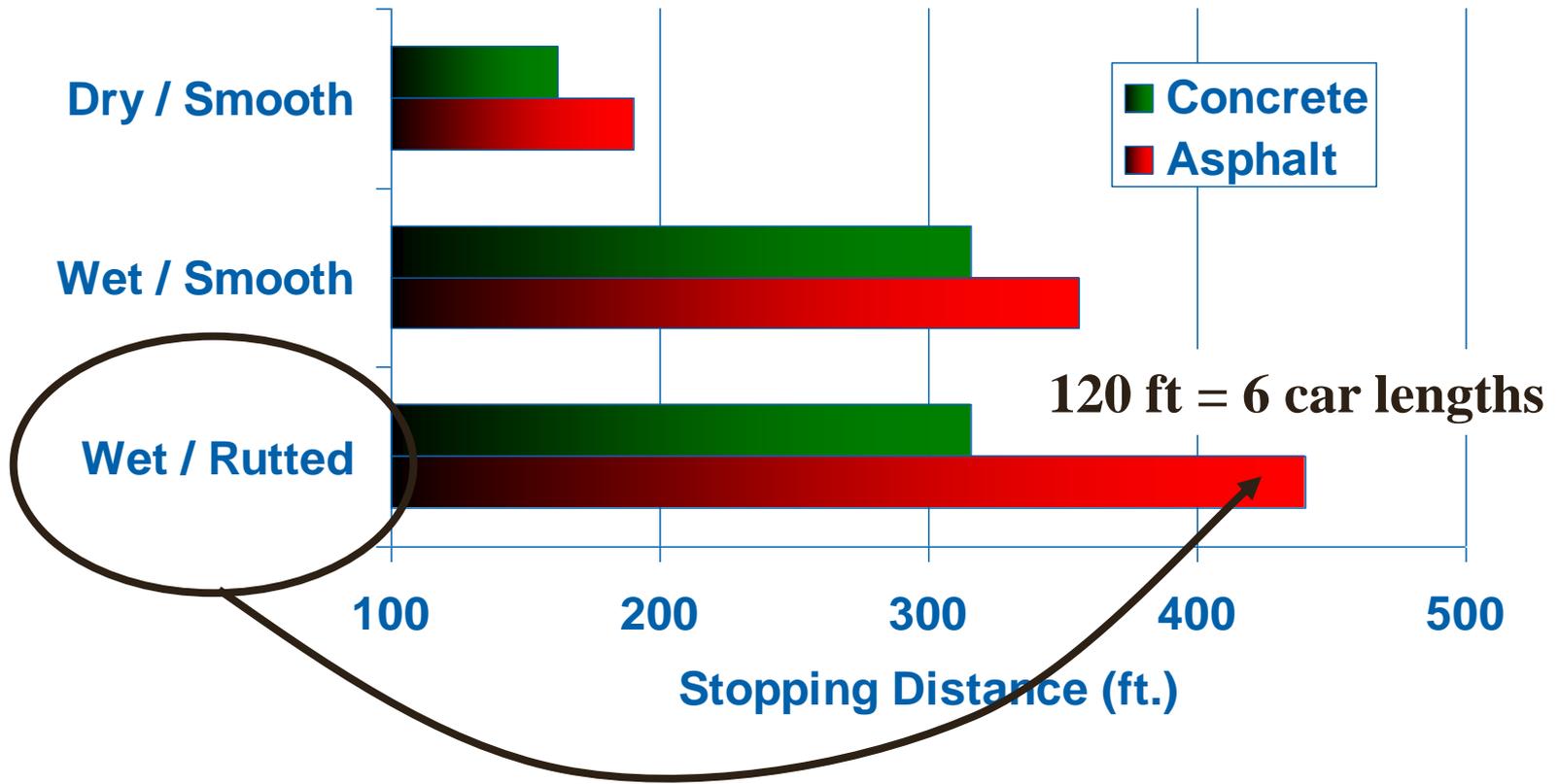
DARK

LIGHT

Do you see a difference?



Shorter Stopping Distance



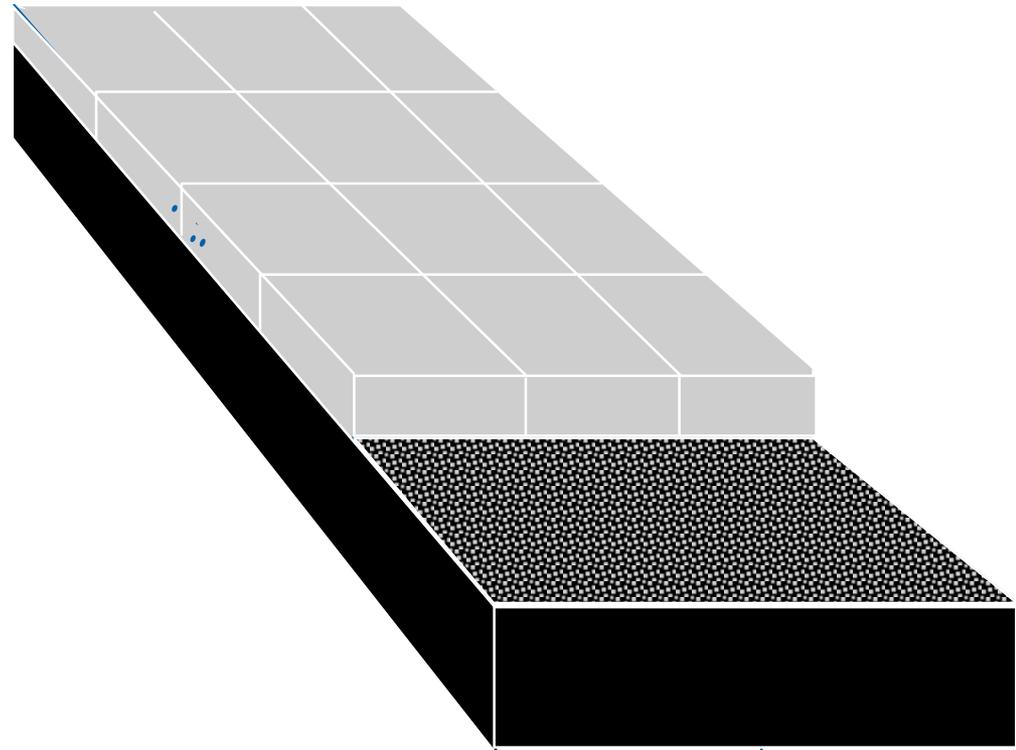
Asphalt Pavements @ Intersections w/ heavy trucks

- 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

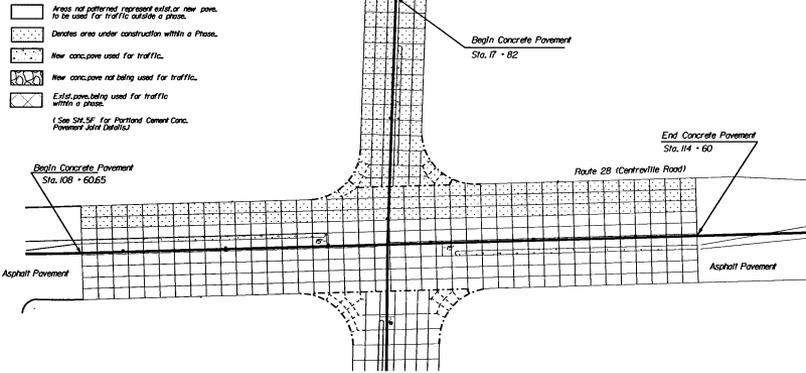
- **City of Manassas Park (NOVA District)**
- **Major Road is Route 28 Centerville Road.**
 - 1998 ADT 50,325; 2018 ADT 74,000; 8% trucks.
- **Minor Road is Manassas Drive.**
 - High volume turning movements.
 - Manassas South on Manassas Drive is an Industrial Park, High School and Commuter rail facility.

Project Background

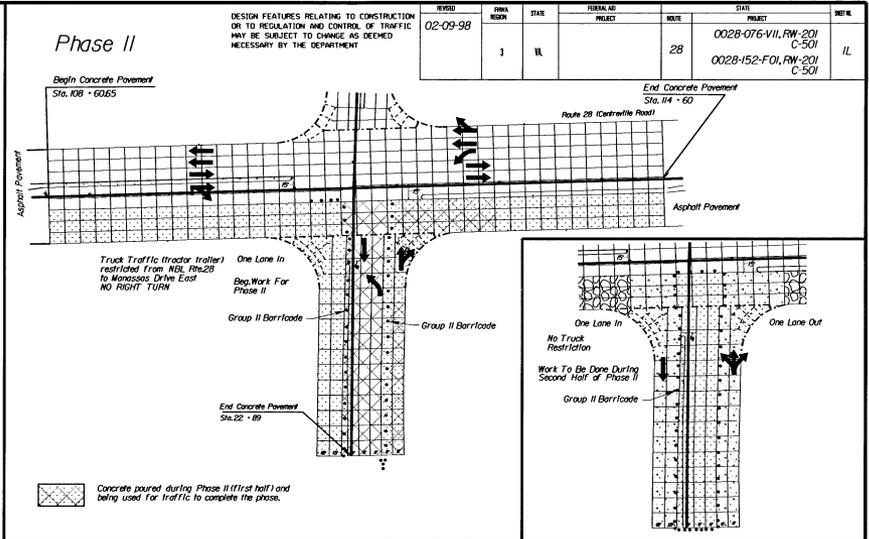
- Originally set up for asphalt concrete construction.
- Chose this high volume intersection to evaluate using concrete.
- Joint detail and MOT added.
- At the preconstruction meeting, goal was set to build award-winning project.
- Good inspection and construction.

Route 28 / Manassas Dr. Sequence of Construction Detail for Concrete Pavement Area

Phase I

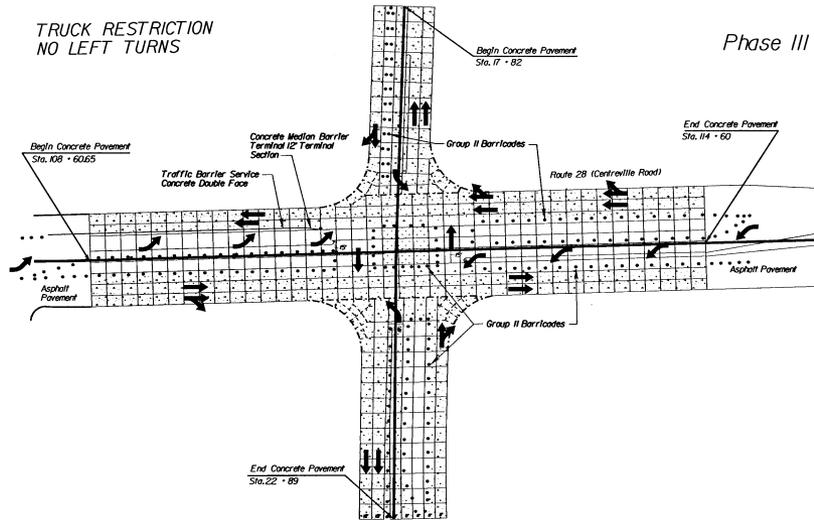


Phase II



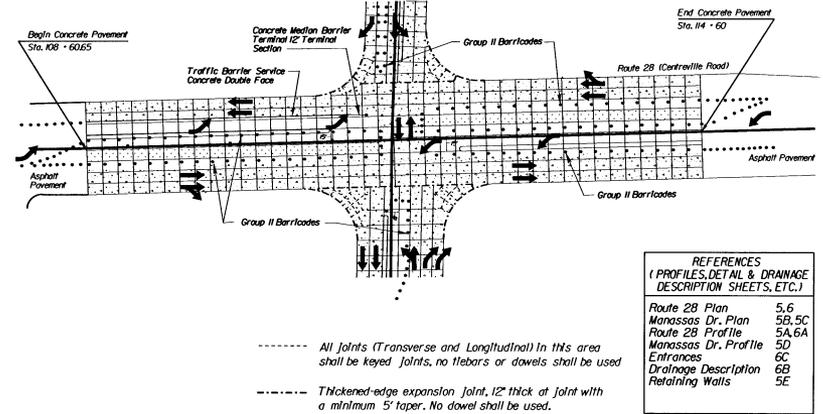
TRUCK RESTRICTION NO LEFT TURNS

Phase III



Phase IV

TRUCK RESTRICTION NO LEFT TURNS Route 28 reciprocal left turns are allowed



REFERENCES (PROFILES, DETAIL & DRAINAGE DESCRIPTION SHEETS, ETC.)	
Route 28 Plan	5,6
Manassas Dr. Plan	5B, 5C
Route 28 Profile	5A, 6A
Manassas Dr. Profile	5D
Entrances	6C
Drainage Description	6B
Retaining Walls	5E

----- All Joints (Transverse and Longitudinal) in this area shall be keyed Joints, no tiebars or dowels shall be used.

----- Thickened-edge expansion Joint, 12" thick at Joint with a minimum 5' taper. No dowel shall be used.

SUBMITTED BY: J.C. Broughton
 SUPERVISED BY: B.V. Sosa
 DESIGNED BY: J.C. Broughton
 CADD: C. P. H. / 05/22/98
 CHECKED BY: J.C. Broughton / 05/22/98

02/09/98 11:50:50

NO.	DATE	BY	CHECKED	DATE	BY
1	02-09-98	J.C. Broughton	B.V. Sosa	02-09-98	J.C. Broughton

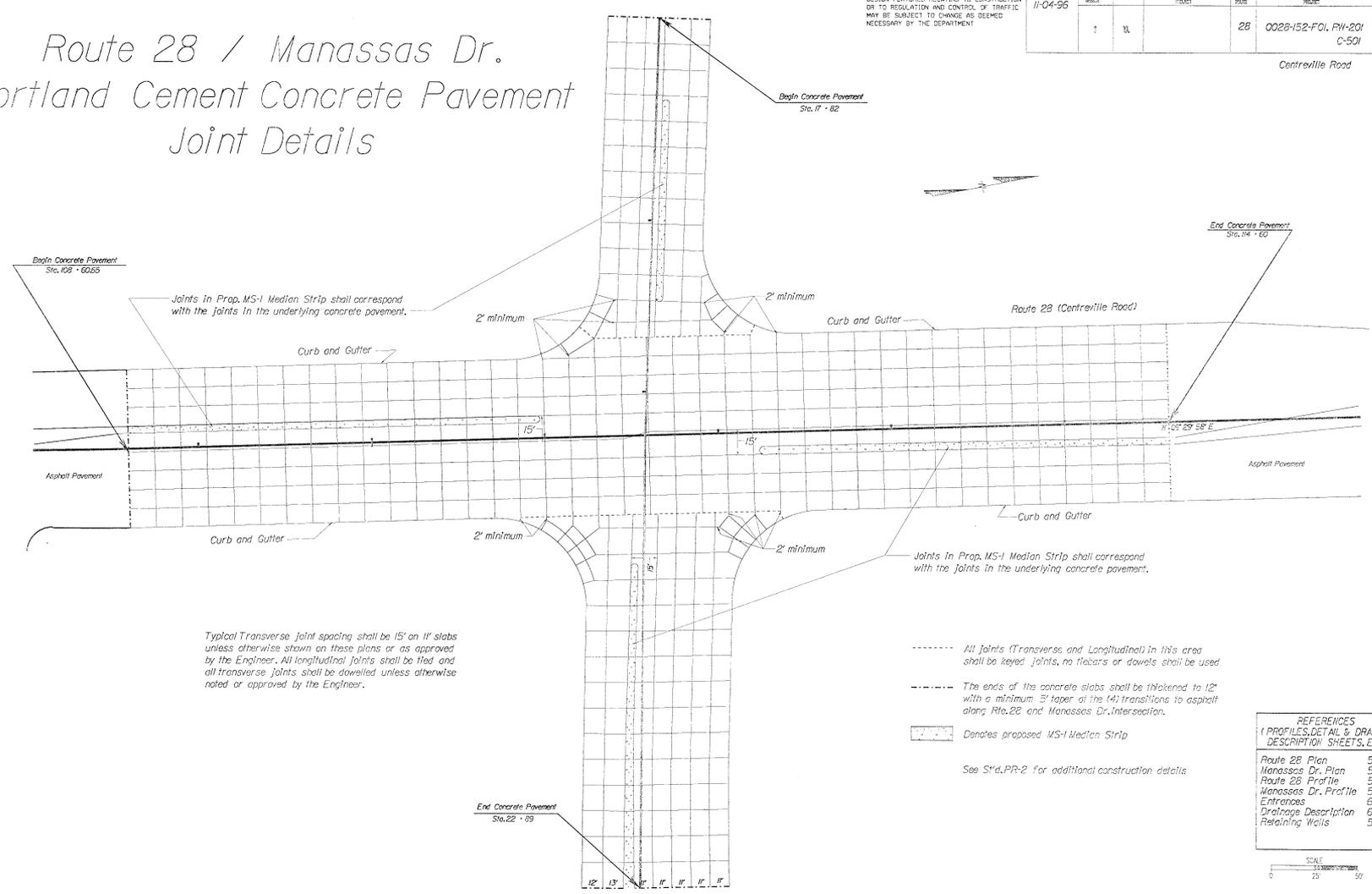
51

Route 28 / Manassas Dr. Portland Cement Concrete Pavement Joint Details

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT.

DATE	REVISION	BY	CHKD	APP'D	ROUTE	PROJECT	SHEET NO.
11-04-96					28	0028-152-FOI, PW-201 C-501	5F

Centreville Road



Typical Transverse Joint spacing shall be 15' on 11' slabs unless otherwise shown on these plans or as approved by the Engineer. All longitudinal joints shall be tied 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 flexars or dowels shall be used.
- The ends of the concrete slabs shall be thickened to 12" with a minimum 3" taper at the (4) transitions to asphalt along Rte. 28 and Manassas Dr. Intersection.
-  Denotes proposed MS-1 Median Strip.
- See Std. PR-2 for additional construction details.

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Drainage Description	6B
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Route 28 Under Construction







1999 ACPA National Award Finalist

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**



AMCO

Southern
877-877-898
Self Serve

Self Serve

Self Serve

Self Serve







35



Southern
Food Stores

FOOD STORE

SELF SERVICE

Southern
Food Stores
874-8714
874-9944
Self Serve

ADAM
Wholesalers
Lynchburg, VA.

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.**















ONLY

KINGS
DOMINION
SOUTH CITY
→ Campground
→ Administration
→ Services
→ Animal Resources

KINGS DOMINION
THE HERBARK



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.

PRODUCE CENTER #1
EST. - 1981

PUMPKINS
IN LARGE LOGS
CHANGE 39¢
SWEET POTATOES 99¢

8
1899

LEFT TURN
YIELD
ON GREEN



1000 EX 1000
1000 EX 1000



PRODUCE CENTER #1
Est. - 1981

PRODUCE CENTER #1

PRODUCE CENTER #1

PRODUCE CENTER #1

PRODUCE CENTER #1

NO LEFT TURN

PRODUCE CENTER #1

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.**



Rd

HOFHEIMER WAY

BOYDTON PLANK RD

PRODUCE CENTER #4

CITY OF FIELDS

Hofheimer Way

ANK RD

Hofheimer Way

PRODUCE CENTER #1

THE PRODUCE CENTER #1
1000 S. HOFHEIMER WAY
MARIETTA, GA 30067
770-429-1111





Hofheimer Way →

LEFT TURN
YIELD
ON GREEN

PRODUCE
CENTER #1
EXT. 1941

PRODUCE CENTER #2

Specialty Produce
100% Natural
No MSG, No Preservatives
No Artificial Colors

**PRODUCE
CENTER #1**
EST. 1961

10AM TO 4

PRODUCE CENTER #1



PRODUCE
CENTER
NO.1

5808 5810 5812 5814

Angels at Play
CHILDCARE CENTER
861-8888

5816 5818 5820

PRODUCE CENTER #1
Your Full Service Grocery Store
Meat, Produce, Grocery
Frozen, Dairy, Milk, Deli,
Propane, Money Orders

we're
game

DO NOT
ENTER

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 Route207 turn lane for Route 652 will be not be closed of more than 14 days.**





EVAPORATOR

JEVIC

S













80324

1048





1.5 M. 34



530430
CROWN
COIK & REAL CO., INC.
5352

EXON
REGULAR 1.59
MID GRADE 1.79
PREMIUM 1.99

Pilot
35¢ 51¢

SPEED LIMIT 45

Daf
Que

SUBWAY



REGULAR DIESEL
15 11.34

Food Mart
Wholesale

33043
CROWN
COX & LEAL CO., INC.
5352

CROWN
80124

SPEED
LIMIT
45

What about now?



Rodgers Creek Blvd

Rte 207 EB (Caroline Co.) Concrete Turn Lane



- **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.**













