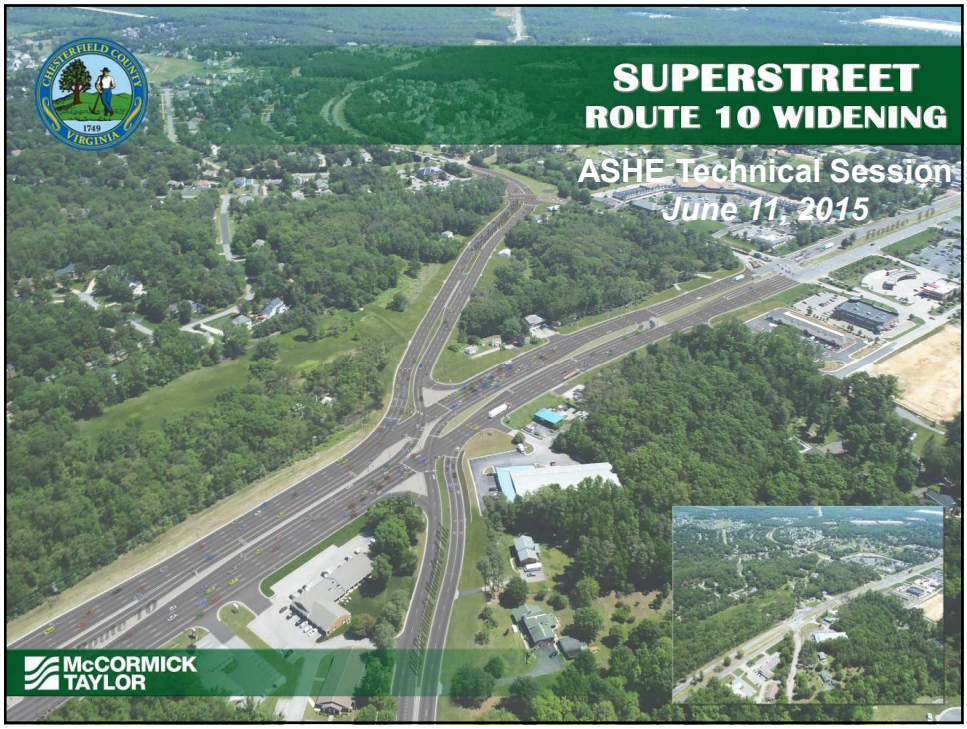
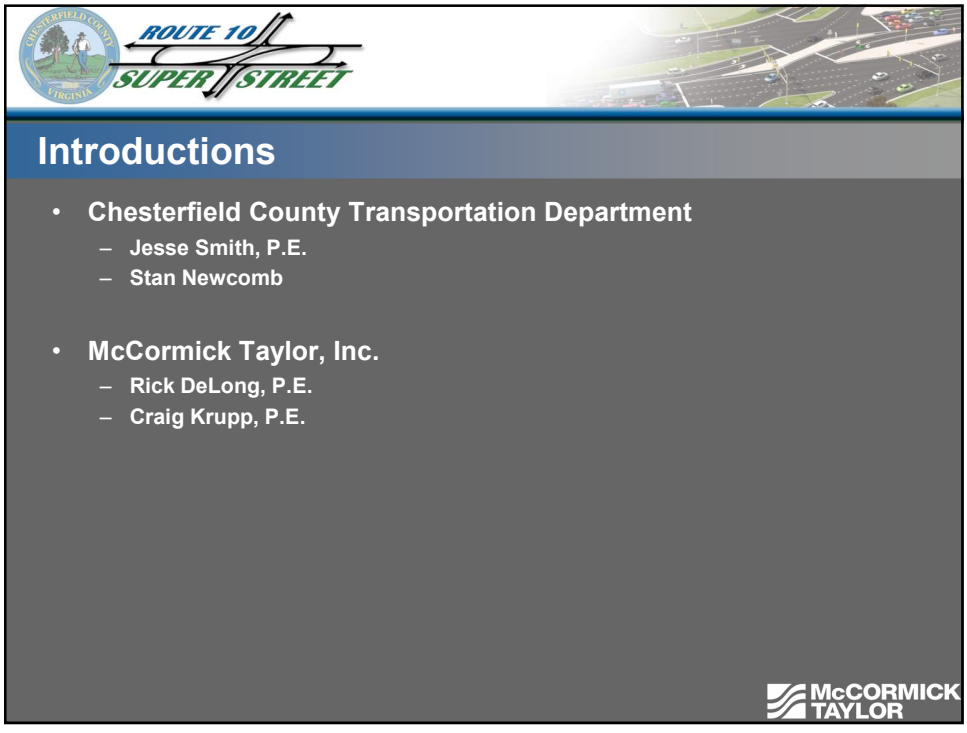

SUPERSTREET
ROUTE 10 WIDENING
ASHE Technical Session
June 11, 2015
McCORMICK TAYLOR


ROUTE 10
SUPER STREET
Introductions
• Chesterfield County Transportation Department
– Jesse Smith, P.E.
– Stan Newcomb
• McCormick Taylor, Inc.
– Rick DeLong, P.E.
– Craig Krupp, P.E.
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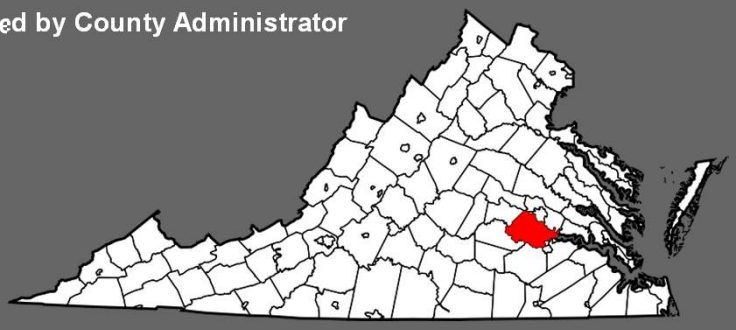
Chesterfield County

- Population – 316,000
- Third most populous county in Virginia
- Governed by Board of Supervisors
- Managed by County Administrator



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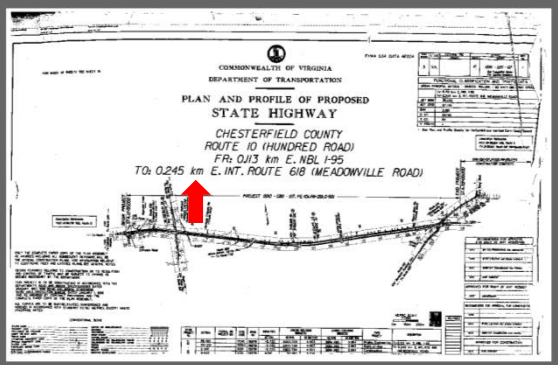
Project History

- Originally designed as one project from I-95 to Meadowville
- VDOT/County agreement executed in 1997 (design only)
- CTB approved design on September 15, 1999



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ROUTE 10 SUPER STREET

Project History

- Removed from SYIP due to lack of funding
- 2004 - County Bond Referendum to widen from I-95 to Ware Bottom Spring
- 2010 - VDOT/ARRA money added to county bond project
- 2014 – county administered project complete

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ROUTE 10 SUPER STREET

Meadowville Technology Park

- Zoned by county BOS in 1996
- 1,500 acres
- 58,000 ADT at build-out
- Owned and managed by Chesterfield's EDA
- Home to Amazon, Capital One, Medline, Northrop Grumman, etc.

295/Meadowville Interchange

- County completed the design and acquired the right of way
- VDOT managed a design-build project to construct the interchange
- Completed in December 2011
- $12.6M local, $5M TPOF, $4M Federal Demonstration funds, $0.45M TCSP funds
- Recipient of 2013 Design-Build Merit Award through DBIA

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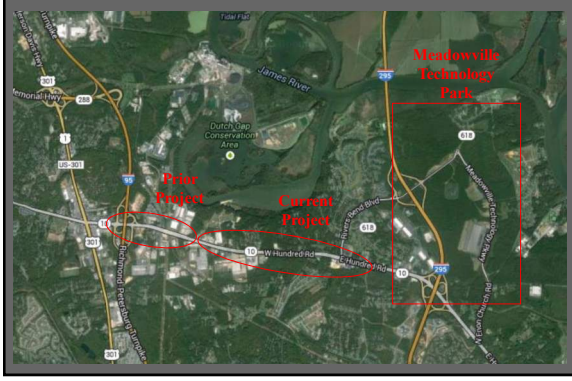
Project History

- Connection of Interstates
- 1999 Preliminary Design
- Meadowville Technology Park



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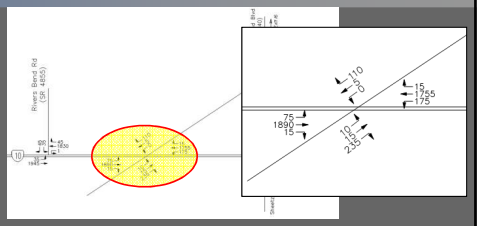
ROUTE 10 SUPERSTREET

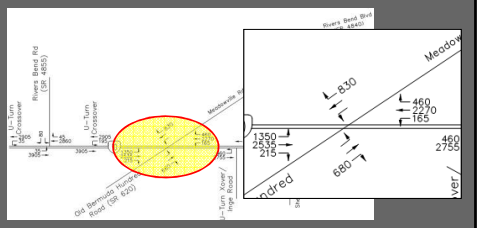
Project History

- Existing Conditions
- Existing vs. Projected Volumes
- Prof. Joseph Hummer & McCormick Taylor

Existing Conditions



2012 Existing AM Peak Hour



2036 Projected AM Peak Hour

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ROUTE 10 SUPERSTREET

Alternatives Analysis

- **Intersection Alternatives**
  - Conventional
  - Flyover
  - Continuous Flow Intersection
  - Superstreet
- **Evaluation Criteria**
  - Operation and Safety
  - Property Impacts
  - Access Management
  - Constructability
  - Cost

Additional Costs over Conventional Dual Left Turn Intersection

	Concept		
	CFI	Superstreet	Flyover
Roadway, Drainage, Grading	$3,000,000	$2,500,000	$1,250,000
Traffic Signals	$650,000	$800,000	$0
Structures	$0	$0	$8,000,000
Right of Way	$1,500,000	$800,000	$1,000,000
Total	$5,150,000	$4,100,000	$10,250,000

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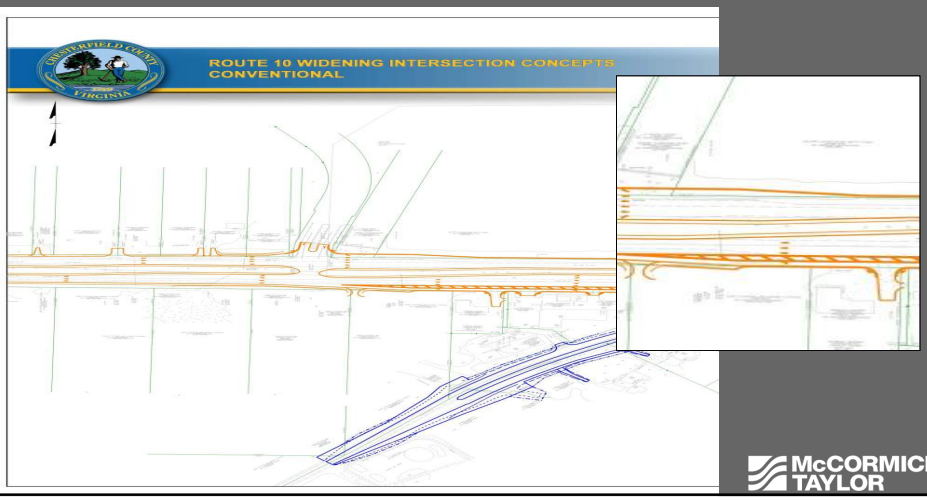
ROUTE 10 SUPER STREET

Alternative Analysis

Conventional Intersection



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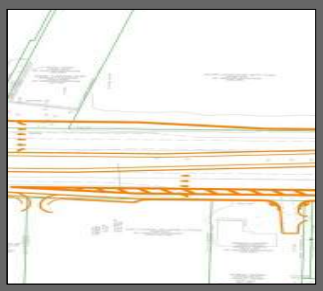
ROUTE 10 SUPER STREET

Alternative Analysis

Conventional Intersection

- **Advantages**
  - Lowest cost of all options
  - Maintains access to businesses
  - No learning curve for drivers
- **Disadvantages**
  - Level of service remains inadequate with anticipated growth



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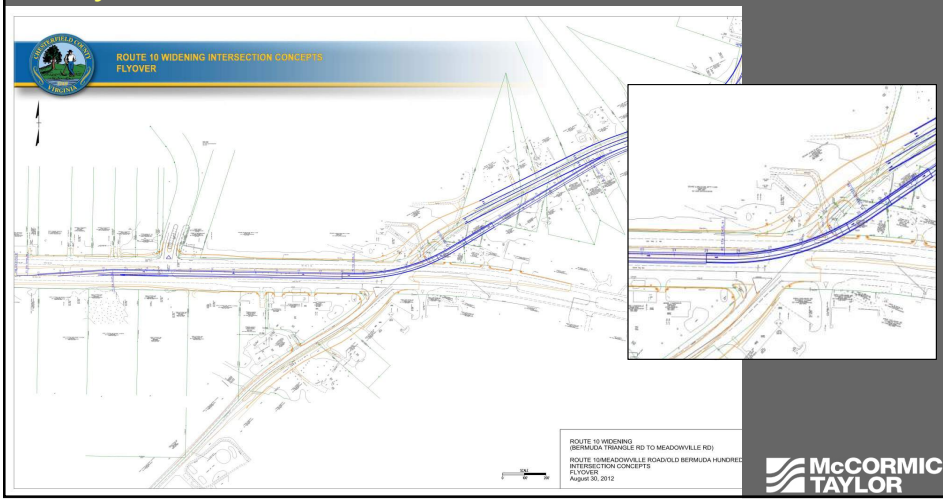
Alternative Analysis

Flyover



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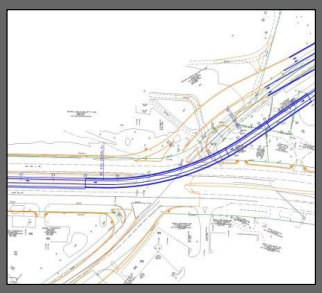
ROUTE 10 SUPER STREET

Alternative Analysis

Flyover

- **Advantages**
  - No Signal to limit left turn movement
  - Construction can be funded when traffic demands require its completion
- **Disadvantages**
  - Up to 12 parcel impacts
  - Costly due to constructability issues and the bridge span length
  - Detours/temporary roadways will be required to complete construction
  - Does not eliminate most conflict points at the intersection
  - Constructability



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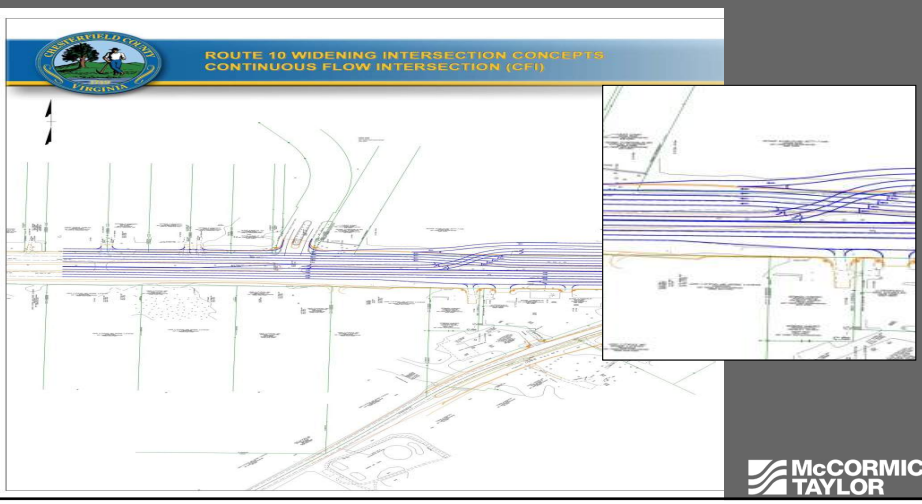
ROUTE 10 SUPER STREET

Alternative Analysis

Continuous Flow Intersection



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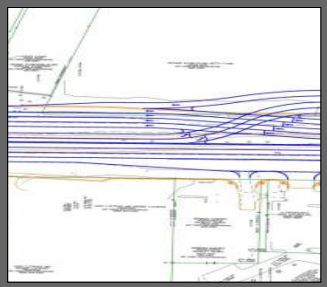
ROUTE 10 SUPER STREET

Alternative Analysis

Continuous Flow Intersection

- **Advantages**
  - Improved capacity, reduced delay
- **Disadvantages**
  - Property access impacts in NE, SE and SW quadrants
  - Significant excavation on westbound side
  - Distance between eastern CFI crossover intersection and Rivers Bend Boulevard
  - Widening in the future is challenging
  - Difficult for pedestrians
  - Driver confusion
  - Constructability



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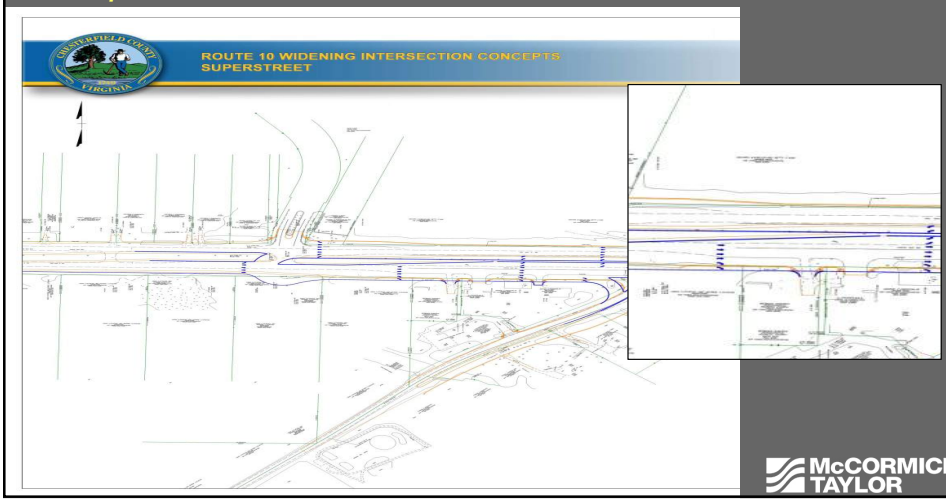
ROUTE 10 SUPERSTREET

Alternative Analysis

Superstreet



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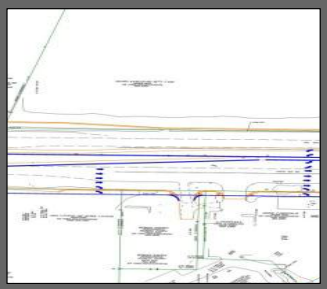
ROUTE 10 SUPERSTREET

Alternative Analysis

Superstreet

- **Advantages**
  - Increased capacity and reduced delay, better traffic progression
  - Traffic signal has just 2 phases
  - Roughly the same footprint as the original intersection concept
  - Property access not as restricted as CFI concept
  - 18 conflict points compared to 32 with traditional intersection
  - Corridor expansion



- **Disadvantages**
  - Driver confusion
  - Minor street delays

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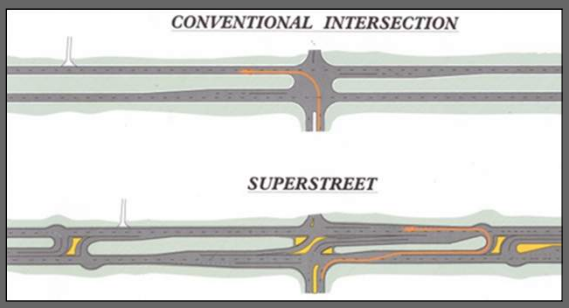
ROUTE 10 SUPERSTREET

Superstreet Background

How Do They Work?

- Eliminates Minor Street Lefts and Thrus
- Downstream U-turns (signalized if warranted)



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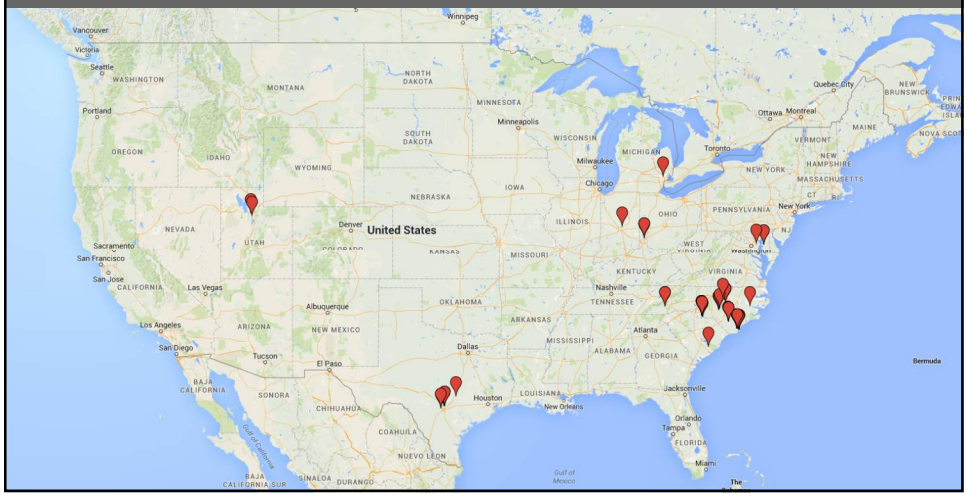
ROUTE 10 SUPERSTREET

Superstreet Background

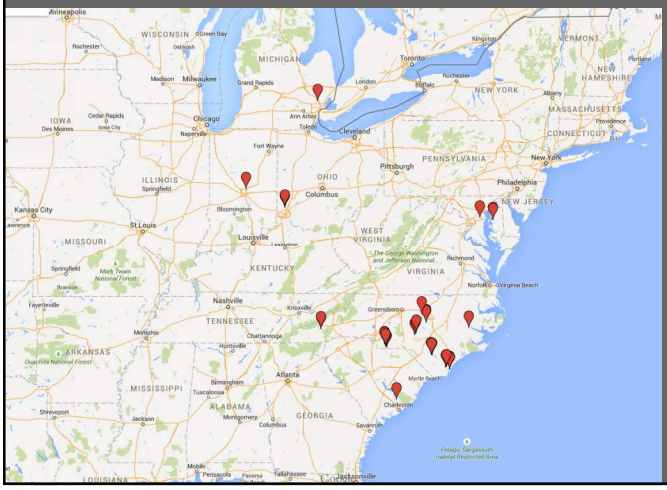
Where Are They?



ROUTE 10 SUPER STREET

Superstreet Background

Where Are They?



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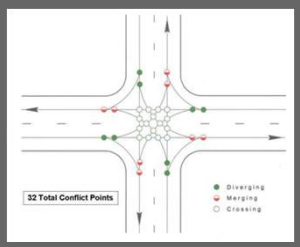
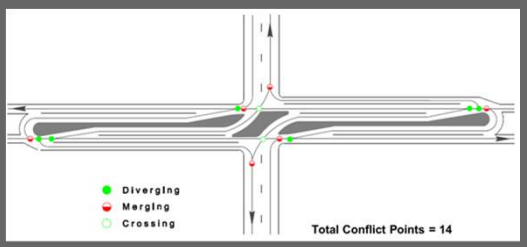
ROUTE 10 SUPER STREET

Superstreet Design

Traffic Engineering & Analysis

- **Reduced Conflict Points**





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Superstreet Design

Traffic Engineering & Analysis

- **Traffic signal has just two phases**
  - Phase 1 – EB thrus/rights, WB thrus/rights
  - Phase 2 – EB lefts, WB lefts, NB rights, SB rights

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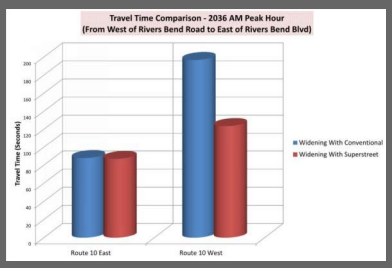
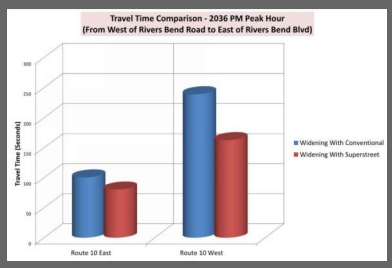
Superstreet Design

Traffic Engineering & Analysis

- **Travel Time Comparison in year 2036 – Superstreet vs. Conventional**
  - Improves 37% on Route 10 (westbound)
  - Improves 20% on Route 10 (eastbound)





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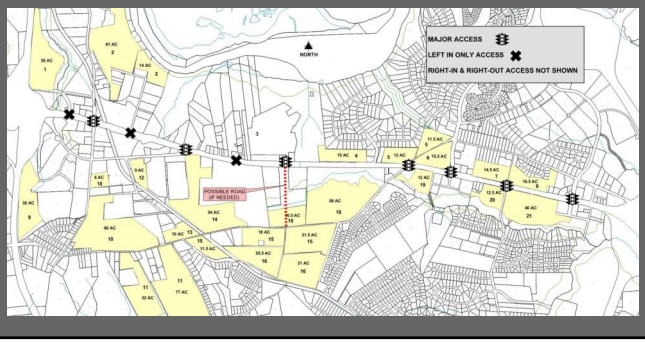
ROUTE 10 SUPERSTREET

Superstreet Design

Design Approach

- **Access Management**
  - Create corridor access plan
  - Consolidate entrances where feasible
  - Entrance spacing from intersection



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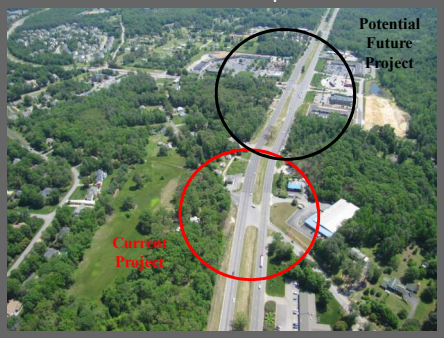
ROUTE 10 SUPERSTREET

Superstreet Design

Traffic Engineering & Analysis

- **Corridor Expansion**
  - Wide existing medians allow for future implementation
  - Potential future superstreet at Rivers Bend Blvd.



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ROUTE 10 SUPERSTREET

Superstreet Design

Design Approach

- **Unique Geometric Considerations**
  - U-Turn placement
  - Design vehicle

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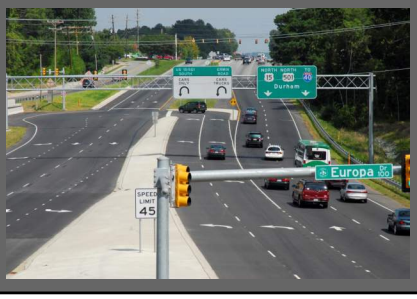
ROUTE 10 SUPERSTREET

Superstreet Design

Design Approach

- **Signing and Pementation Markings**
  - Convey message to drivers
  - Varies from MUTCD standards



Superstreet Design

Flythrough Video

- Aerial

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Superstreet Design

Flythrough Video

- Aerial
- Roadway Design

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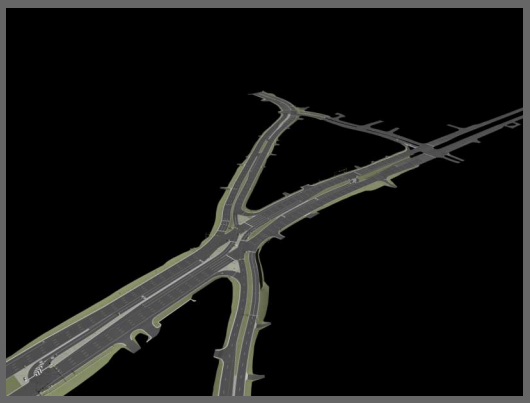
ROUTE 10 SUPER STREET

Superstreet Design

Flythrough Video



- Aerial
- Roadway Design
- Modeling

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Superstreet Design

Flythrough Video

- Aerial
- Roadway Design
- Modeling

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Superstreet Design

Flythrough Video

- Aerial
- Roadway Design
- Modeling
- Traffic Simulation

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Superstreet Design

Flythrough Video

- Aerial
- Roadway Design
- Modeling
- Traffic Simulation
- Graphic Details
  - Real Vehicles
  - Real Trees
  - Buildings
  - Flythrough Animation

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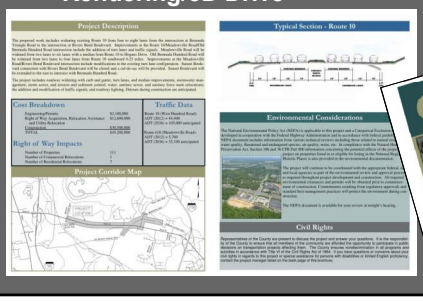
Superstreet Design

Public Involvement

Our Approach

- Early Identification and Involvement with Stakeholders
- Recommend an early Citizen Information Meeting
- Education Brochures
- Simulations & Photo Rendering/3D Drive



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Public Involvement

Our Approach

Flythrough Video

Display Boards

VISSIM

Plan Review

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Superstreet Project Status

- Estimated cost of $51M
- Current funding is $25M
- Spent 2 years evaluating options and performing preliminary engineering
- Consulted with Dr. Joseph Hummer, an international leader in unconventional intersection design
- Right-of-way acquisition will start this summer
- Should compete well in HB2 process

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THANK YOU