

# ARTERIAL

PRESERVATION PROGRAM

## ***Protecting Virginia's Arterial Investments***

*Coordinating Transportation and Land Use Planning Forum*

*May 10, 2018*

*Robert Williams*

*VDOT, Transportation and Mobility Planning Division*



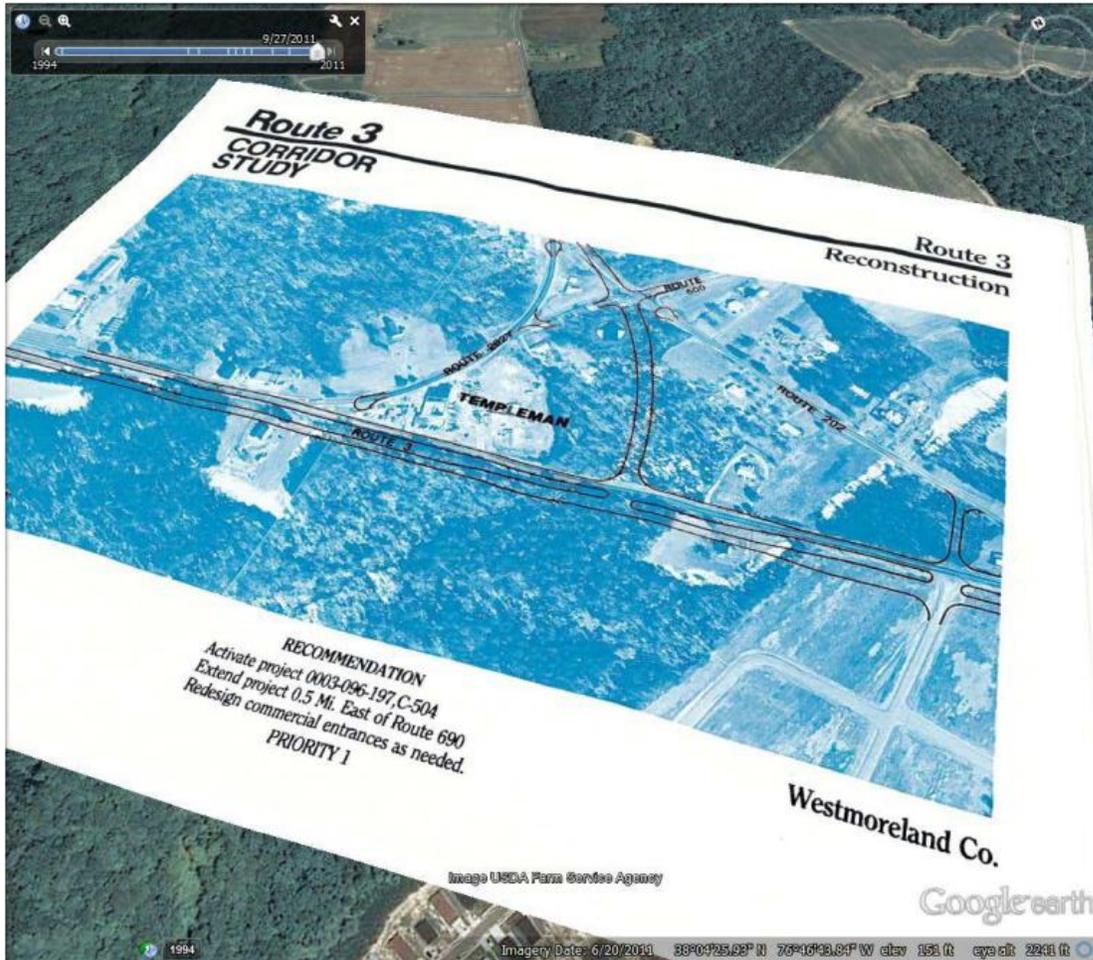
# Agenda

- Arterial Preservation Program
  - Background
  - Goals
  - Access Management Overview
  - Innovative Intersection Overview
- Arterial Preservation Program Methodology
  - Segmentation and Emerging Intersections
  - Deliverable Examples
  - Framework Document
  - Communication Plan
  - Implementation Strategies

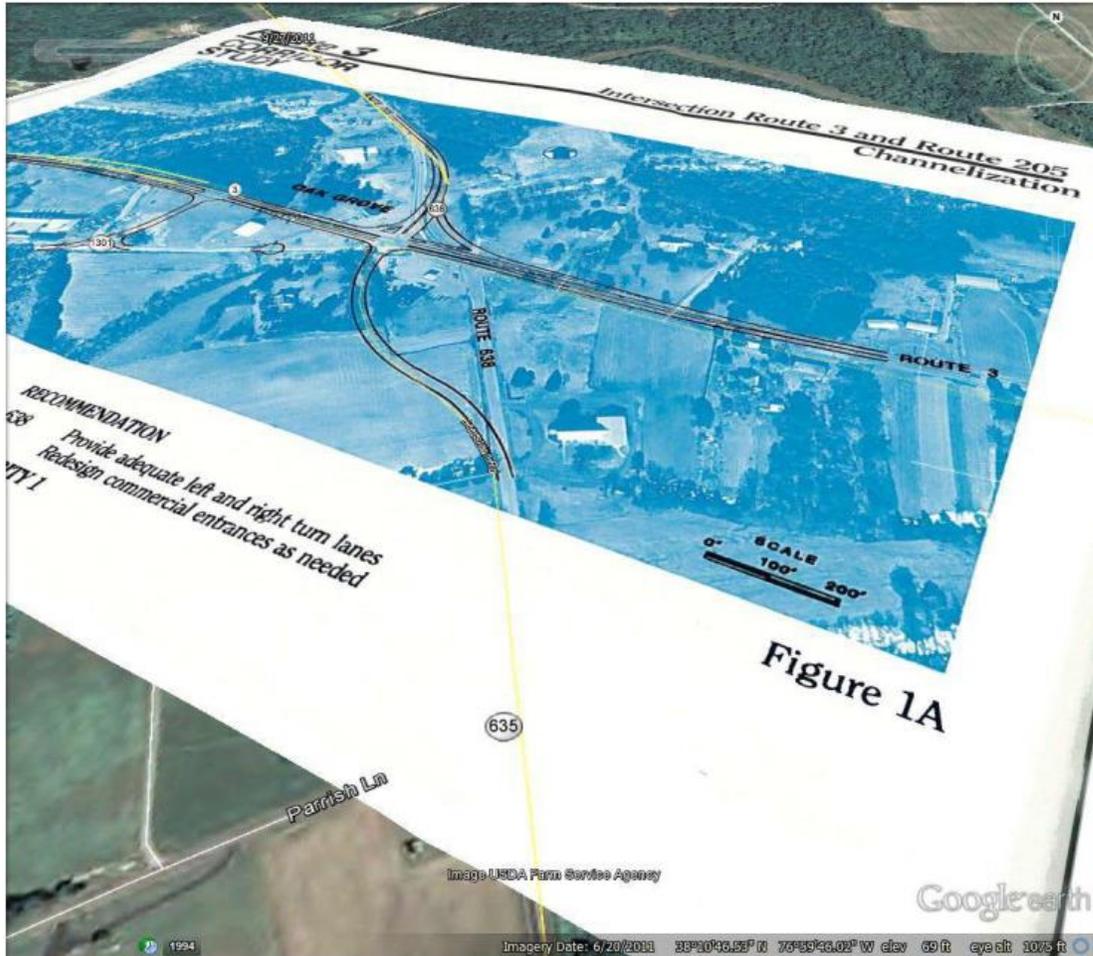
# Arterial Preservation Program

Background

# Background



# Background



# Slow Erosion of Safety and Capacity

- Main street character
- Direct access at site level
- Difficult to plan and manage access at the site level
- Traffic signal proliferation
- Promote local economy at expense of safety, capacity and mobility



# Why This Matters

- “Buy back” capacity
- We simply do not have the funding to continue this cycle
- Better protect our investments
- Extend the life of our investments by treating the system as a finite resource



# Pioneering Arterial Preservation Program

- Developed from the Arterial Management Plans
- Arterial Preservation Program
  - Consistent and Repeatable Process
  - Provide a clear and concise corridor vision
  - Identify focus areas and solutions
- Initial Stages of Arterial Preservation Program Methodology
  - Living methodology
- Conducting Pilot Studies
  - US 301/207 (41 miles)
  - Rt. 3 (5 miles)
  - US 220 (43 miles)
  - US 29 (60 miles)
  - US 460 (95 miles)
  - US 58 – Hampton Roads District (71 miles)
  - US 58 – Richmond District (65 miles)

# Arterial Preservation Program

## Goals

# Program Goals

To preserve and enhance the capacity of the Arterial Preservation Network while ensuring that:

- Mainline through traffic is served with priority
- Access points and traffic control do not degrade travel speed and safety
- Safety is improved

# Implementation Strategies

- Integrate program priorities with local economic development goals
- Improve access management
- Educate communities on the benefits of improved mobility
- Inspire comprehensive, transportation and zoning planning efforts
- Eliminate unwarranted traffic signals
- Implement innovative intersection configurations



# Program Initiatives

VDOT has initiated a review of the following policies and procedures to align with the goals of the Arterial Preservation Program:

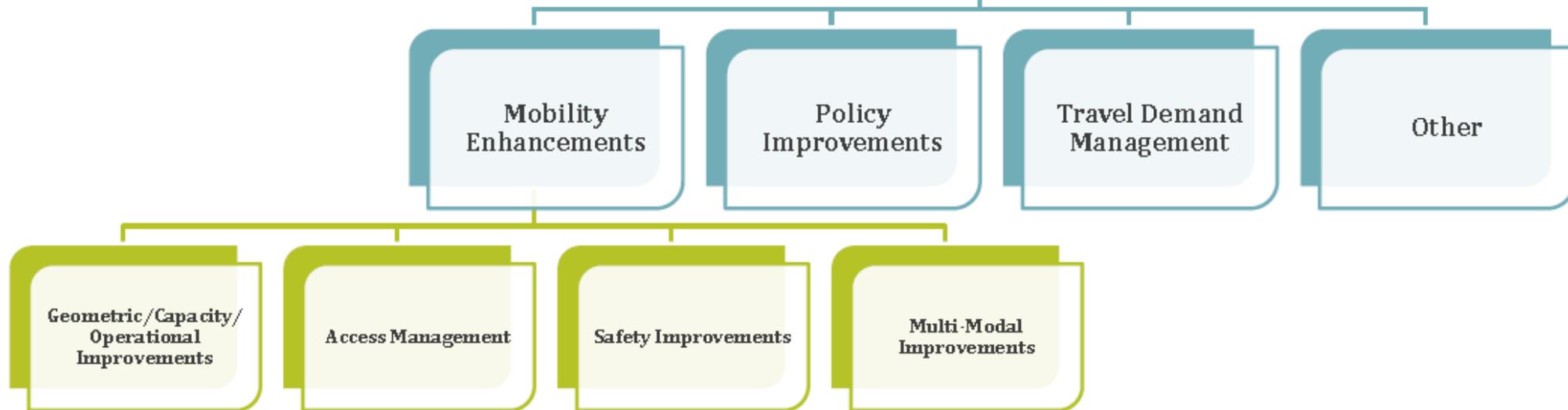
- Access Management Regulations – subject to Administrative Process Act (APA) procedures
- Current design exception process
- Innovative intersection and interchange design policy and guidance
- Traffic signal warrants
- VDOT's role in project development on Urban extension projects

# Policy and Procedure Revisions

- Office of Land Use (LU)
  - IIM-LU-200: Review of Rezoning Proposals
  - IIM-LU-500: Review of Site Plans and Subdivision Plats
  - IIM-LU-501: Access Management Spacing Exceptions/Waivers
- Traffic Engineering Division (TED)
  - IIM-TE-387: Traffic Signal Justification Reports
- Transportation and Mobility Planning Divisions (TMPD)
  - IIM-TMPD-2.0: Corridor Planning Studies
- Road Design Manual
  - Chapter 2D: Plan Design
  - Appendix A: Design Guidelines
  - Appendix F: Access Management Design Standards

# Program Solutions

## Toolbox of Alternatives



# Program Website

- Website Link:  
[http://www.virginiadot.org/programs/vdot\\_arterial\\_preservation\\_program.asp](http://www.virginiadot.org/programs/vdot_arterial_preservation_program.asp)

**ARTERIAL**  This page highlights the Virginia Department of Transportation (VDOT) Arterial Preservation Program.

[Program purpose and need](#) | [Arterial Preservation Network](#) | [Program goals](#) | [Implementation strategies](#) | [Program initiatives](#) | [Resources](#)

## Purpose

The Arterial Preservation Program is designed to preserve and enhance the capacity and safety of the critical transportation highways included in the Arterial Preservation Network.

These major highways accommodate long-distance mobility of people and goods throughout the commonwealth. Preserving mobility on these corridors is critical to the current and future economy.

Within the framework of the Arterial Preservation Program, VDOT is developing methodologies to consistently and programmatically evaluate the corridors, creating a toolbox of preservation and enhancement strategies and identifying opportunities to implement these strategies.

As an alternative to widening major highways to add capacity, preservation and enhancement strategies promote the use of innovative transportation solutions, minimizing delays for through traffic and improving safety, while incorporating local economic development goals.

Developed in partnership with localities, the strategies will be used as tools to plan for infrastructure that supports future land use and development.

## Arterial Preservation Network

The Arterial Preservation Network includes segments of selected major highways that are part of the Corridors of Statewide Significance (CoSS) system or are functionally classified as principal or other principal arterials.

These major highways are needed for statewide connectivity, which is critical for economic development.

The *proposed* Arterial Preservation Network is below, pending adoption into VTrans2040 by the Commonwealth Transportation Board (CTB).

### ON THE MAP:

- Mobility enhancement segment
- Mobility enhancement segment (non-CoSS)
- Mobility preservation segment
- Mobility preservation segment (non-CoSS)
- Not part of Arterial Preservation Network
- Urbanized area
- Urban center

[View larger map](#)

**ARTERIAL**  PRESERVATION PROGRAM

**VDOT**  
Virginia Department of Transportation

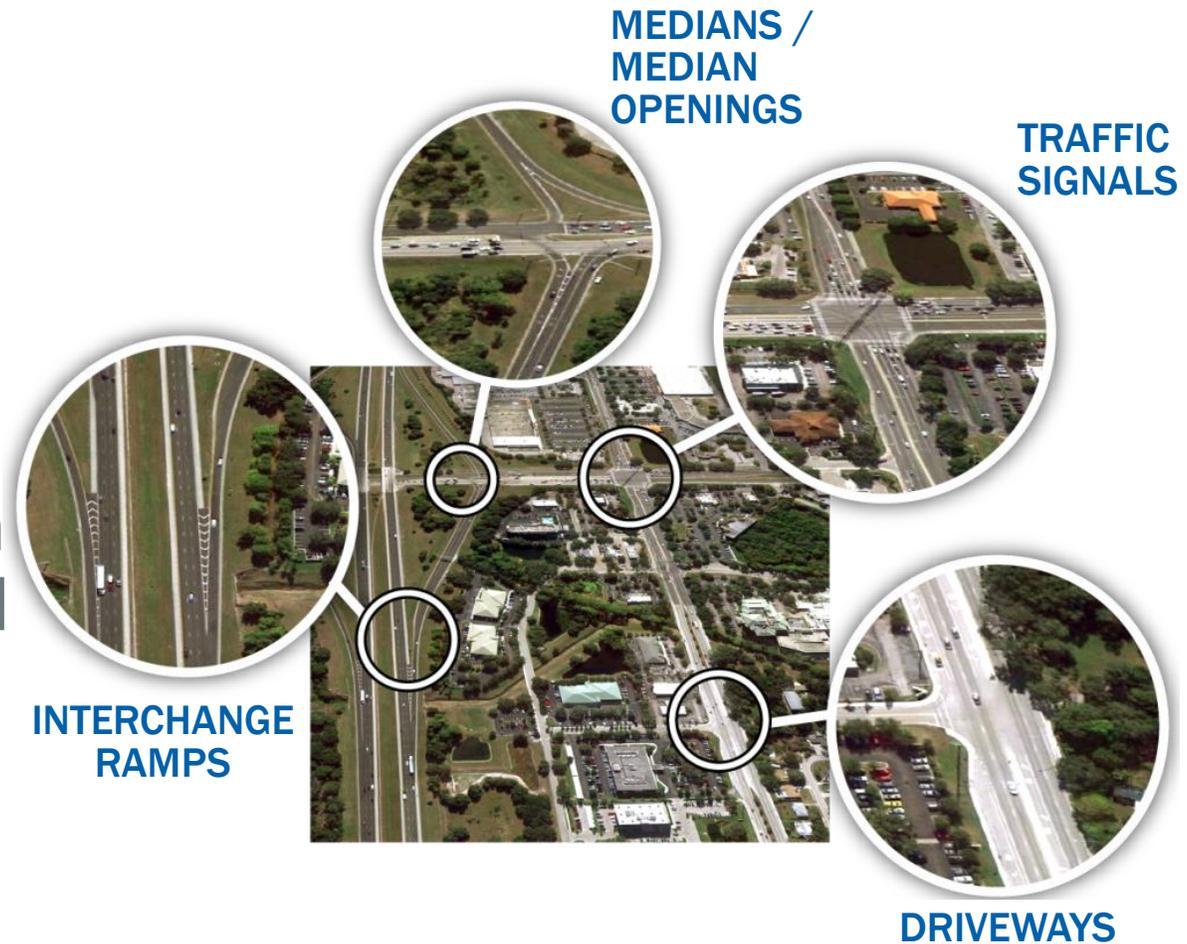
# Arterial Preservation Program

## Access Management Overview

# Access Management

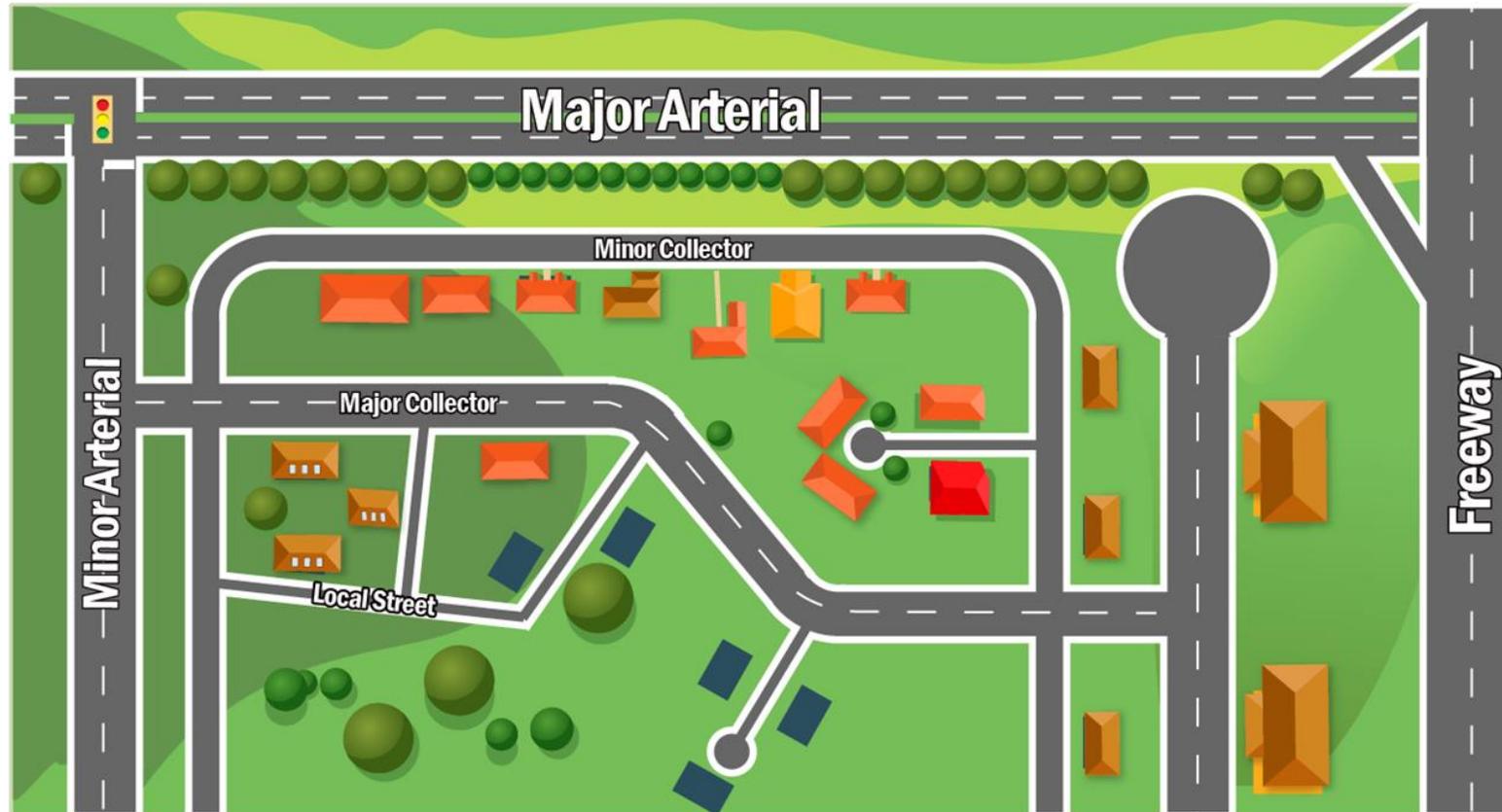
## What is Access Management?

Access management involves the location, spacing, and design of driveways, medians, median openings, traffic signals, and interchanges

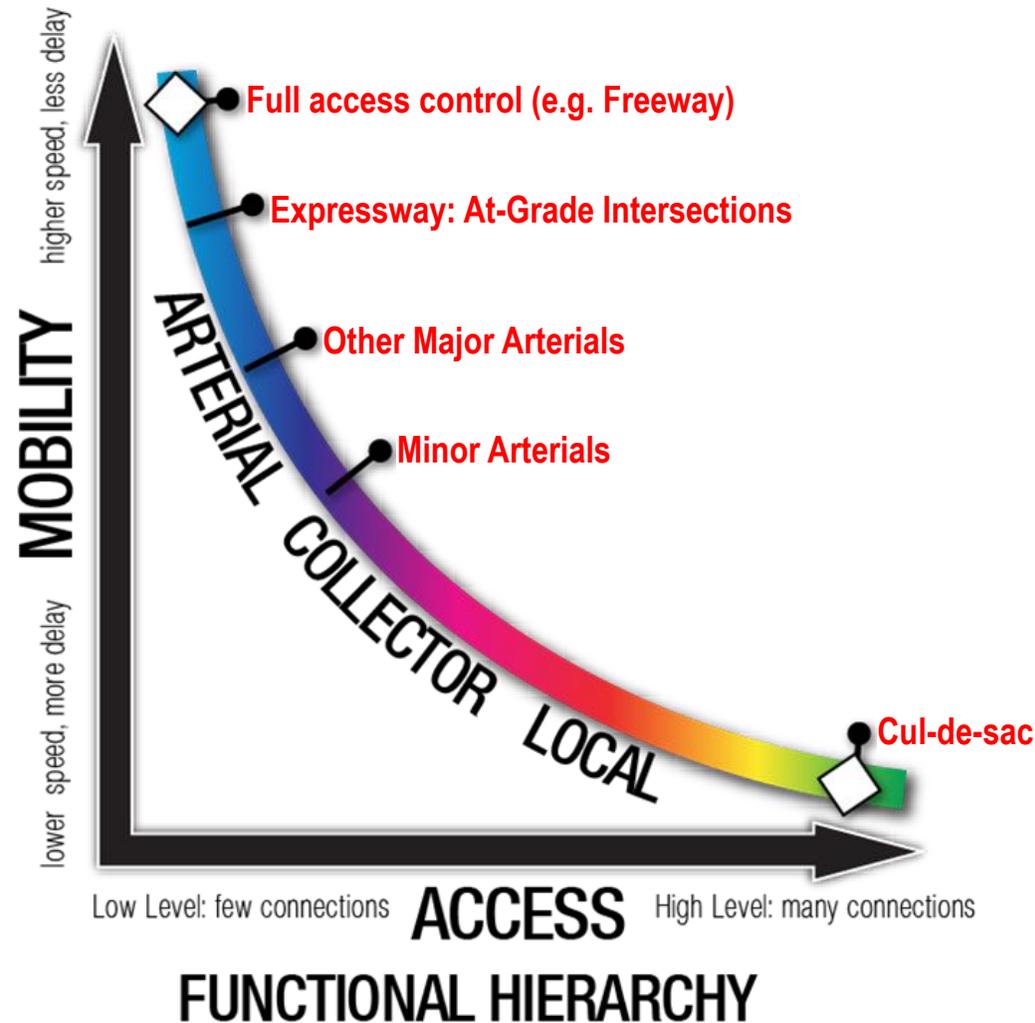


# Roadway Hierarchy

## Functional Classification



# Balance between Mobility and Access

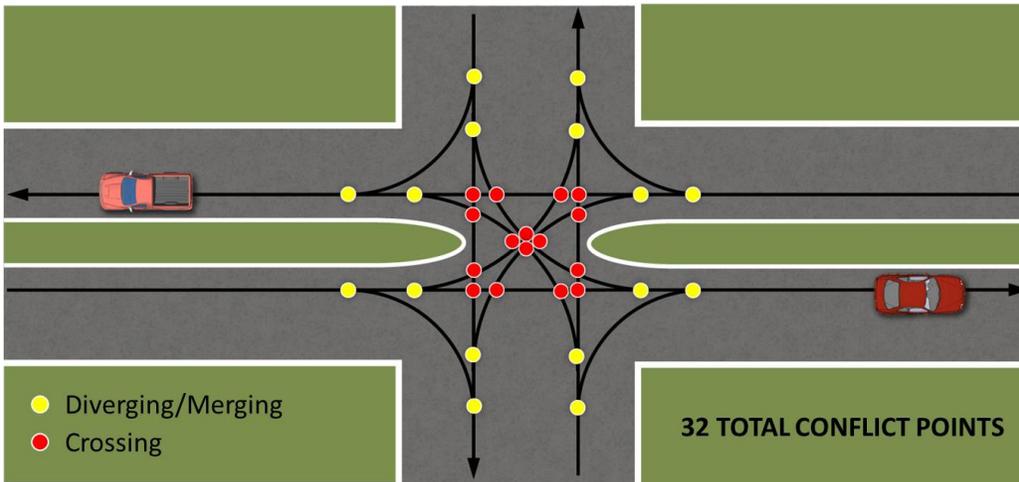


# Guiding Principles

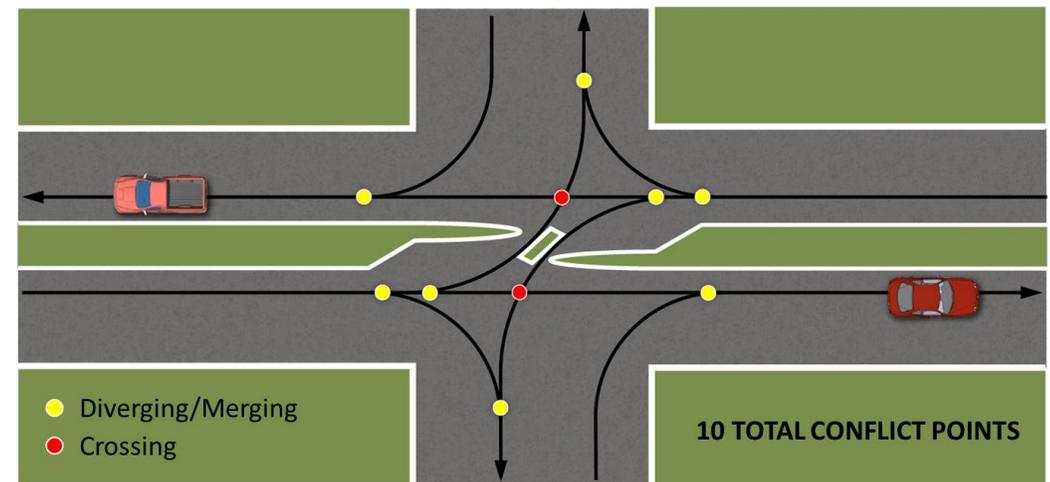
- Limit the number of conflict points
- Separate conflict points
  - Reduce the number of median openings
  - Provide directional median openings
  - Improve driveway design
  - Consolidate driveways to reduce frequency
- Look at conflict points from a network perspective

# Conflict Points

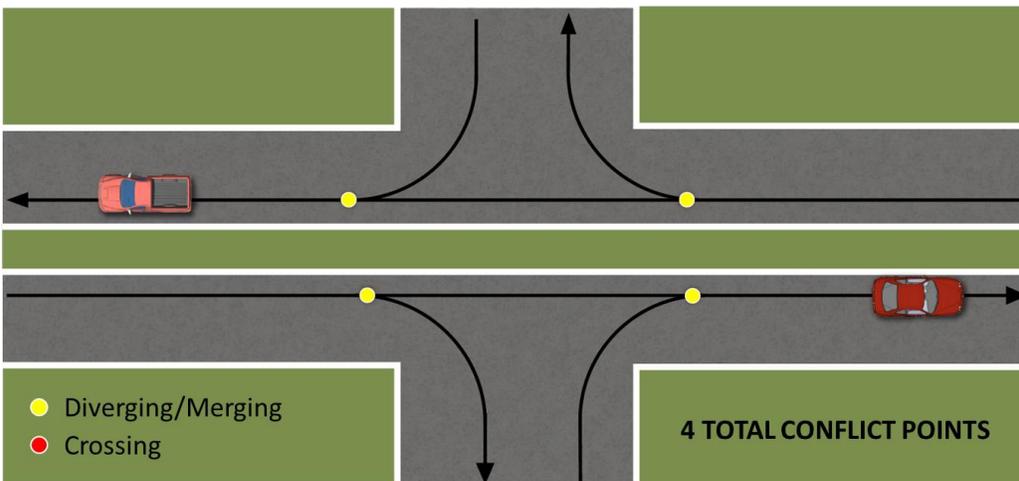
FULL UNSIGNALIZED MEDIAN OPENING



DIRECTIONAL MEDIAN OPENING

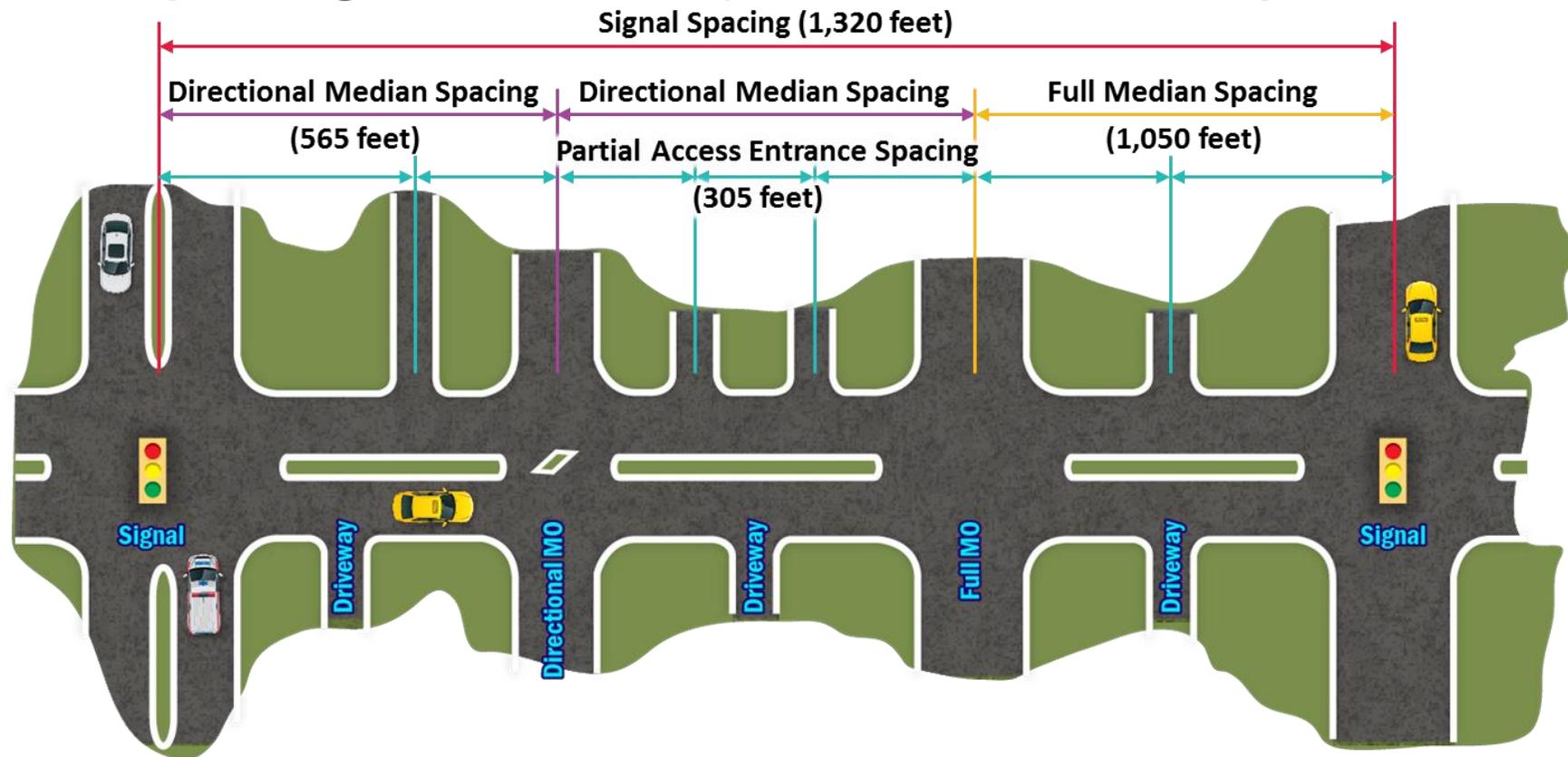


RIGHT-IN/RIGHT-OUT DRIVEWAY



# Access Management Guidelines

- VDOT Spacing Standards (*35-45 MPH Principal Arterial*)



# Access Management Benefits

- Increased Signal Spacing Benefits
  - Improves traffic flow
  - Reduces congestion
  - Improves air quality

Signals per Mile	Increase in Travel Time (%)
2	-
3	9
4	16
5	23
6	29
7	34
8	39

Signals per Mile	Crashes per Million VMT
Under 2	3.53
2 to 4	6.89
4 to 6	7.49
6 +	9.11

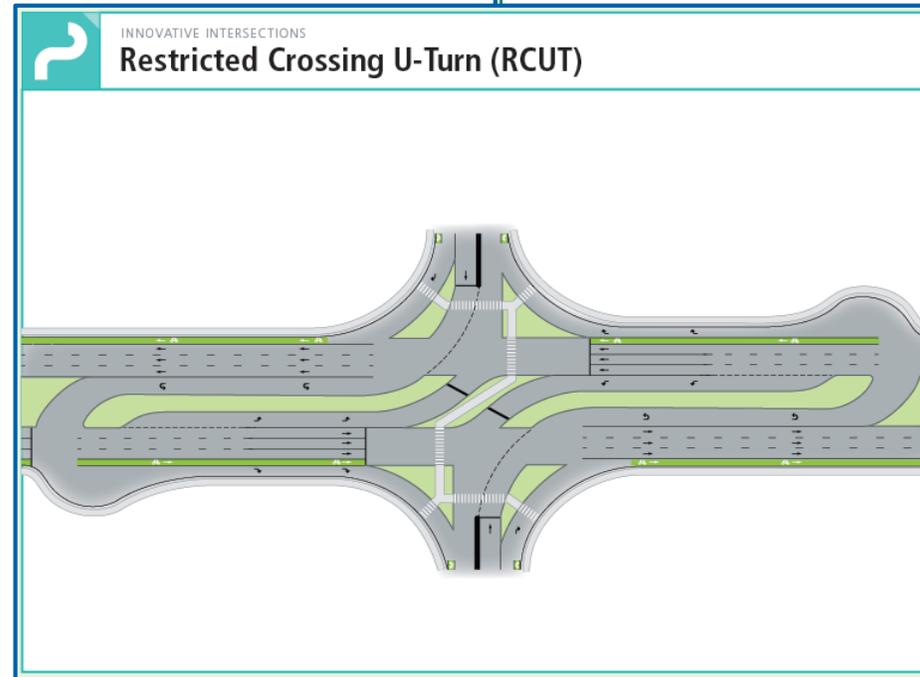
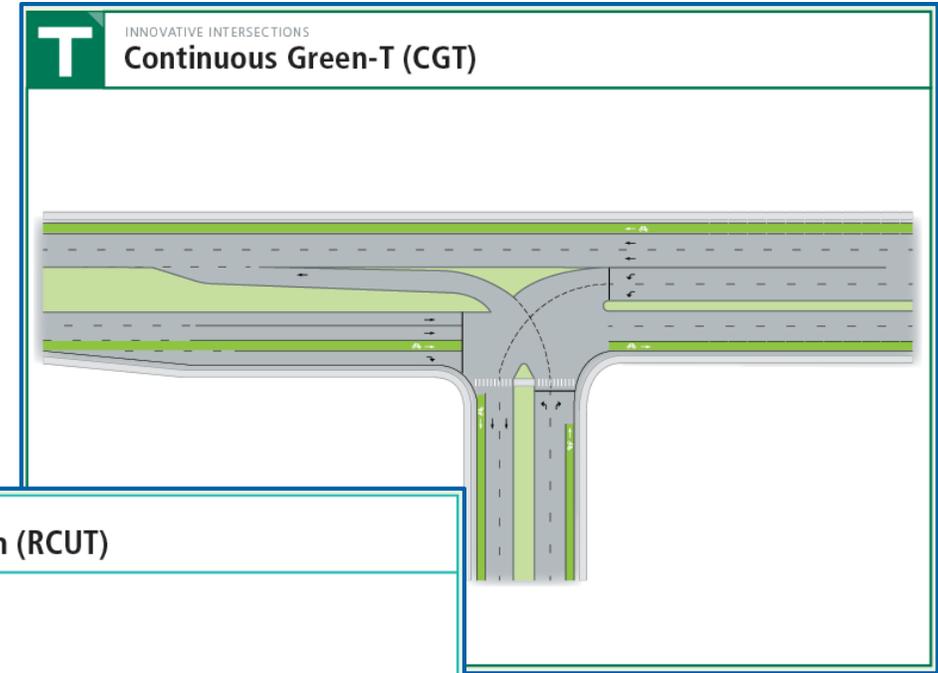
Source: Federal Highway Administration (FHWA)  
[https://ops.fhwa.dot.gov/access\\_mgmt/docs/benefits\\_am\\_trifold.htm](https://ops.fhwa.dot.gov/access_mgmt/docs/benefits_am_trifold.htm)

# Arterial Preservation Program

Innovative Intersections Overview

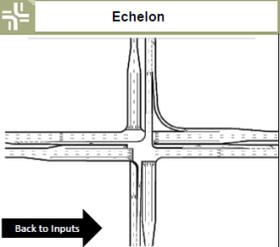
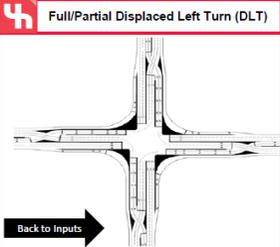
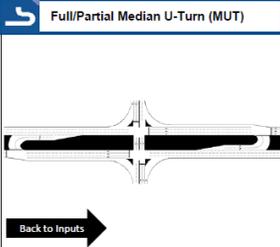
# Innovative Intersections

- Designs where traffic movements are modified to:
  - Improve safety
  - Reduce delay
  - Increase efficiency
- Can reduce delays and crashes as much as 50%
- Also known as:
  - Alternative
  - Non-traditional
  - Unconventional
  - Reduced Conflict



# Innovative Intersection Tools

- VDOT's Junction Screening Tool (VJuST)
  - Conceptually compares traditional vs. innovative intersections
  - Website: [http://www.virginiaadot.org/info/alternative\\_intersection\\_informational\\_design\\_guides.asp](http://www.virginiaadot.org/info/alternative_intersection_informational_design_guides.asp)

VJuST VDOT Junction Screening Tool		DESIGN CONSIDERATIONS	
<b>Intersection Designs</b>		<b>Full/Partial Displaced Left Turn (DLT)</b>	<b>Full/Partial Median U-Turn (MUT)</b>
			
<b>Description</b> One approach on both the major and minor roadways is elevated to create two grade-separated intersections of two one-way roads. Each intersection operates under two-phase signal control.	<b>Description</b> Left-turning vehicles cross over to the other side of the roadway at a signalized intersection several hundred feet in advance of the main intersection. The protected left turns occur simultaneously with the opposing through movements at the main intersection, allowing for two- (full) or three-phase (partial) signal control. This design is also referred to as a Continuous Flow Intersection or Crossover Displaced Left Intersection.	<b>Description</b> Left-turn movements from the major roadway (partial) or both roadways (full) are removed from the main intersection. These vehicles instead execute a U-turn at a median opening on the major roadway downstream of the main intersection. Removing the left-turn movements allows for two- (full) or three-phase (partial) signal control. This tool assumes all intersections are signalized. However, this intersection can be designed as partially unsignalized.	
<b>When Should This Design Be Considered?</b> The echelon intersection should be considered at high-volume urban or suburban intersections where the major and minor roadways have similar volumes.	<b>When Should This Design Be Considered?</b> The displaced left turn intersection should be considered if opposing approaches have high and balanced through and left-turn volumes.	<b>When Should This Design Be Considered?</b> The median U-turn intersection should be considered on high-speed, median-divided highways with moderate left-turn volumes on the major roadway and minor left-turn volumes on the minor roadway.	

# Arterial Preservation Program

Methodology

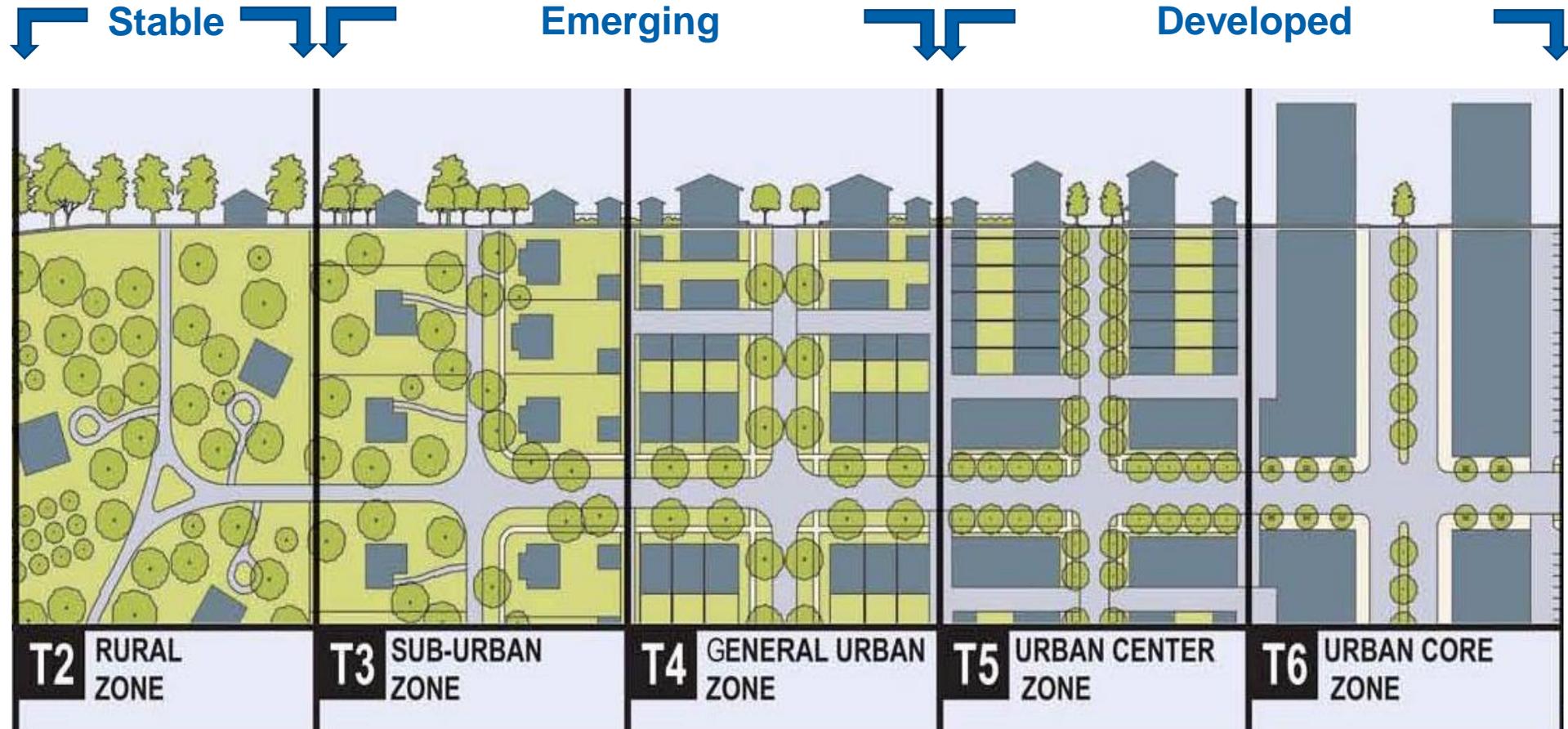
# Methodology

- Data Compilation
- Segmentation (two-step process)
  - Step 1: Initial data screening
  - Step 2: Local input refinement
- Traffic Count Data
- Traffic Forecasting
- Alternative Development
- Public Engagement
- Recommendations and Implementation Strategy

# Segmentation

- Previous Studies
- Comprehensive Plans
- Traffic Data (i.e., volumes, speed, volume-to-capacity, travel time)
- Crash Data
- Land Use (Existing and Future)
- LandTrack
- Land Use Permitting System (LUPS)
- District input

# Segmentation



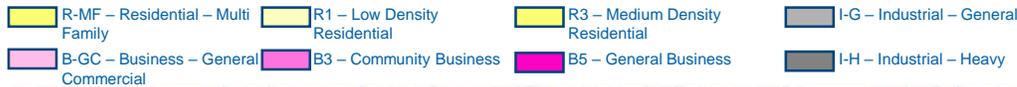
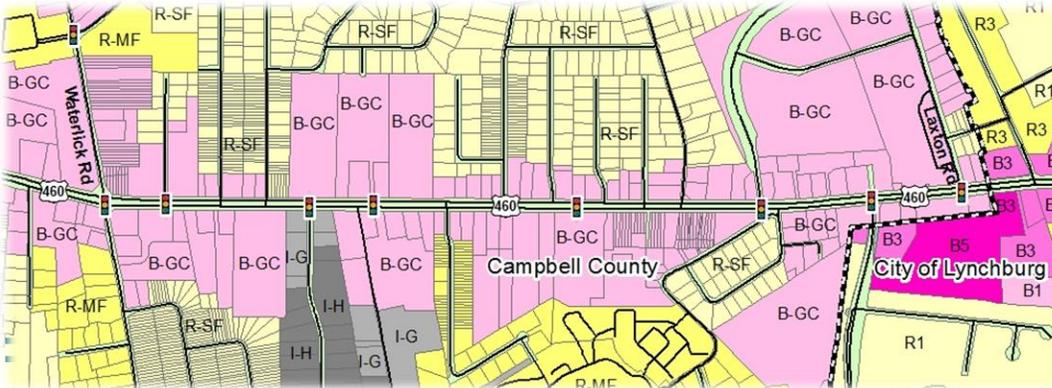
Source: Duany Plater-Zyberk & Company

# Developed Segments

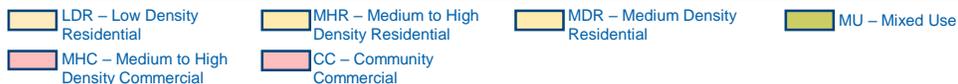
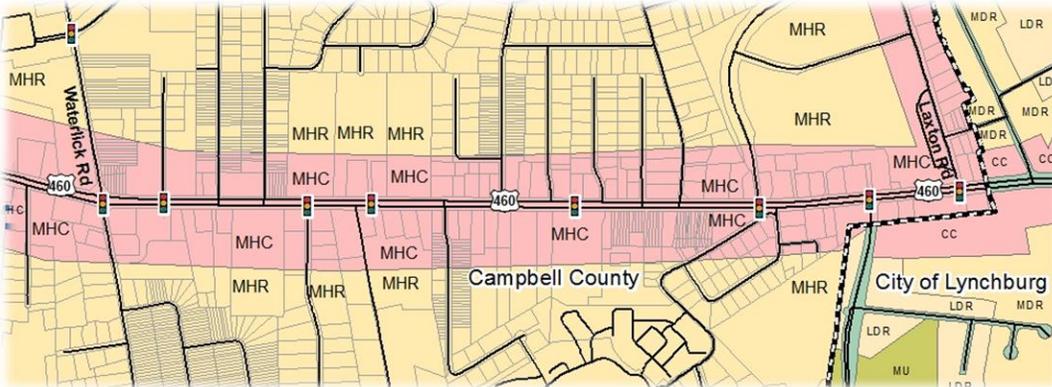
Aerial



Existing Land



Future Land



## Segment Description

Developed segments have an existing concentration of residential, commercial, manufacturing, and industrial land development. These segments have a higher density of existing access points and often include a series of signalized intersections.

## Goals

Improve the efficiency and safety of the segment through a retrofit strategy by eliminating unwarranted traffic signals, improving access management spacing, and exploring innovative intersection configurations.

## Examples

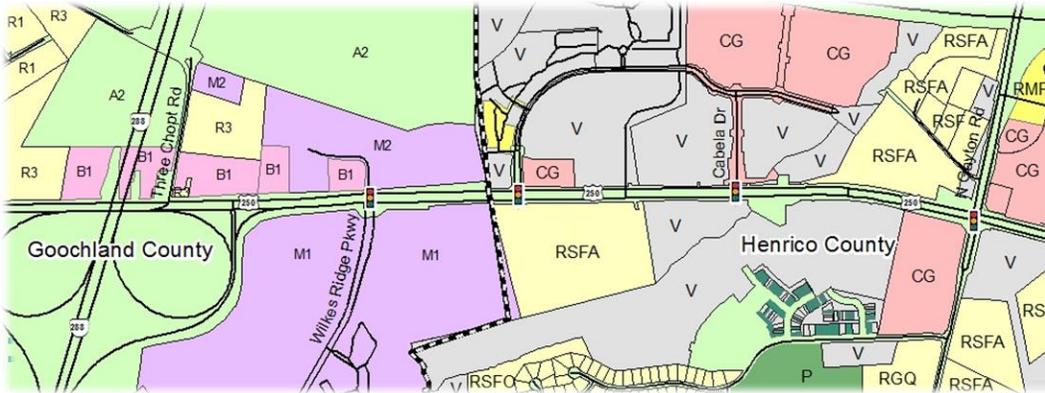
US 460 (Timberlake Road) from Waterlick Road to Greenview Drive in the City of Lynchburg; US 250 (Broad Street) from Dominion Boulevard to West End Drive in Henrico County

# Emerging Segments

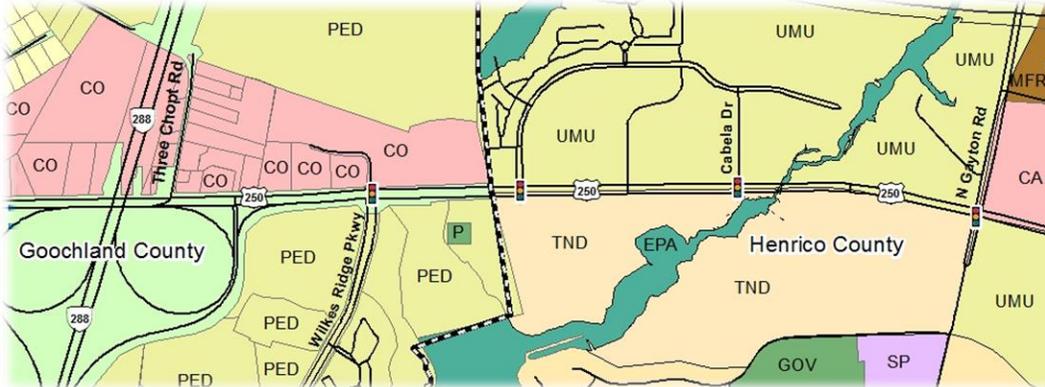
Aerial



Existing Land



Future Land



## Segment Description

Emerging segments are stretches of roadway that have active development or high potential for increased development within 10 years. These segments are often adjacent to developed segments or are adjacent to segments where limited access designations terminate.

## Goals

Develop a corridor management strategy to maintain and protect the efficiency of the segment while promoting and facilitating local economic development goals.

## Examples

US 250 (Broad Street) in Goochland/Henrico Counties; US 220 (Virgil H. Goode Highway) from Brick Church Road to the Rocky Mount town limits in Franklin County

# Stable Segments

## Segment Description

Stable segments may experience sporadic development but the land use is expected to remain consistent over the long term. These segments often traverse between developed and emerging segments.

## Goals

Preserve the efficiency of the segment by promoting increased access management spacing and identifying spot intersection improvements.

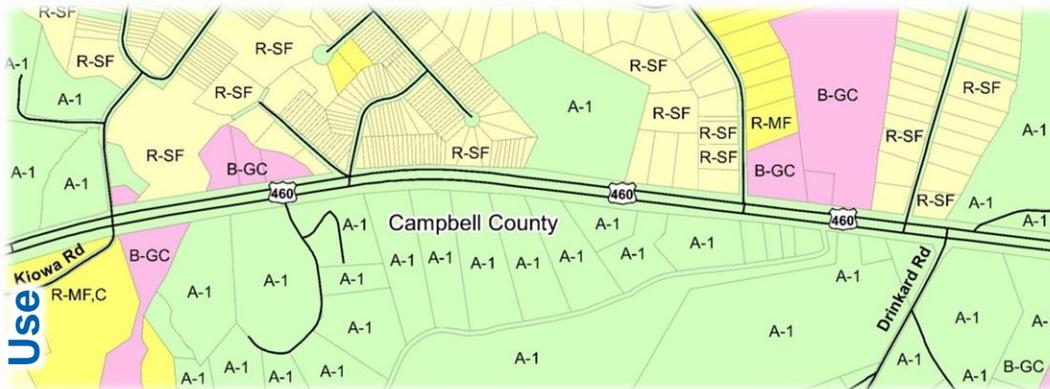
## Examples

US 460 (Richmond Highway) from Kiowa Road to Drinkard Road in Campbell County; US 29 (Wards Road) from Fox Ridge Lane to Phillips Lane in Campbell County

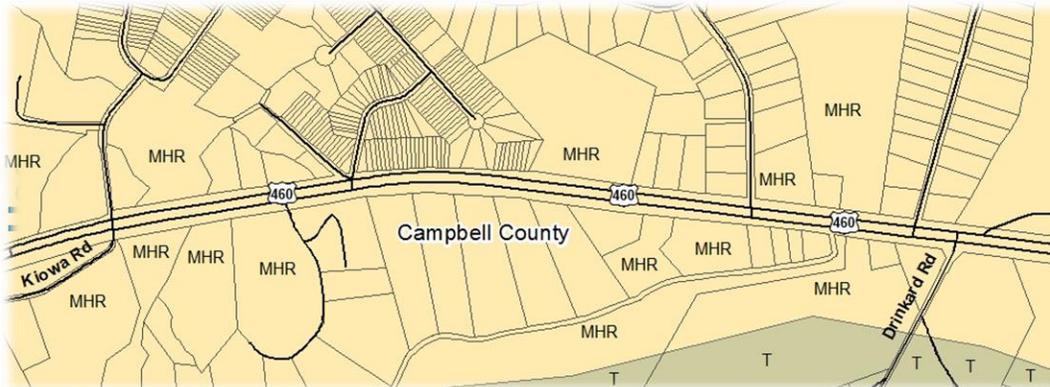
Aerial



Existing Land Use



Future Land



# Emerging Intersection Criteria

- Signalized Intersections
- Potential for Safety Improvement (PSI) Intersections
- Junction of two primary routes
- Minor Street ADT  $\geq$  10% of major street ADT
- Crashes
- Intersections that will experience heavy increased in traffic due to future development
- Park & Ride investment strategy intersection
- District input

# Emerging Intersections

## Intersection Description

Emerging intersections are existing or future intersections that experience safety, operational or congestion issues, or are expected to see an increase in demand due to planned or active development on the intersecting route.

## Goals

Strategically target spot improvements and explore innovative intersection configurations to maintain or improve the safety and operations of the arterial.

## Approach

Identify emerging intersections based on:

- Existing PS locations
- Junctions of two primary routes
- Existing congestion
- District input

## Example 1:

US 220 (Franklin Road) at Southern Lane; US 220 (Franklin Road) at Southern Hills Drive/Valley Avenue in the City of Roanoke.

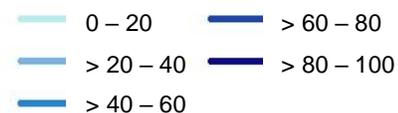
**ARTERIAL**  
PRESERVATION PROGRAM

**VDOT**  
Virginia Department of Transportation

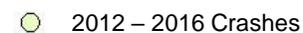


### LEGEND

2015 TTI Percentile by District



2015 PSI Intersection Rank



2012 – 2016 Crashes

### US 220 INFORMATION

2016 ADT = 32,000  
2015 V/C Ratio = 0.55  
2030 V/C Ratio = 0.65

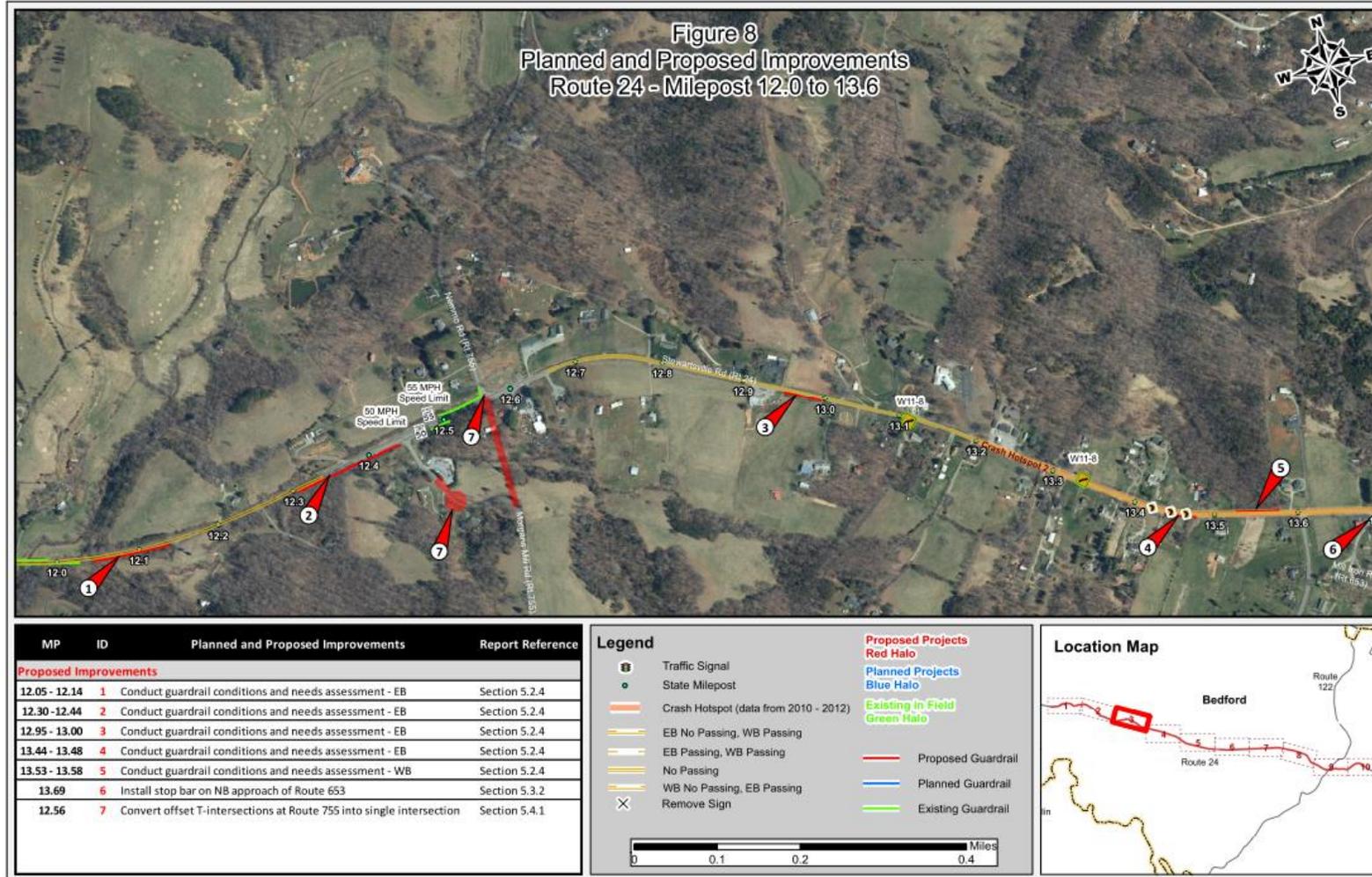
### VALLEY AVE INFORMATION

2016 ADT = 3,600

# Arterial Preservation Plan

Deliverable Examples

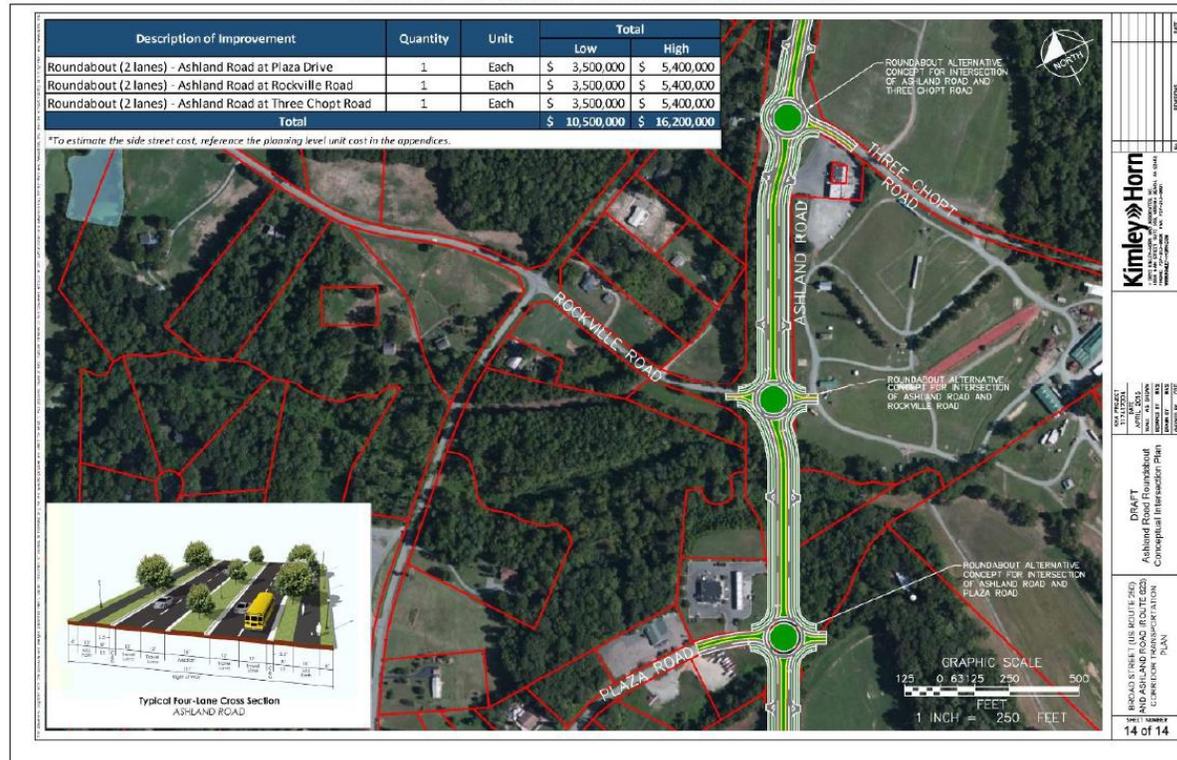
# Deliverable Examples



# Sample Conceptual Design

Arterial Management and Interstate Access Plan for US Route 250 and State Route 623

Plan Sheet 14: AMP Recommendations – Ashland Road Potential Roundabout Locations



# Sample Conceptual Design

## ALTERNATIVE 7A – REALIGNMENT OF 2<sup>ND</sup> STREET APPROACH AT FRONT STREET 2<sup>ND</sup> STREET/KENTS RIDGE ROAD AT FRONT STREET

### Project Description

This project improves safety and reduces driver confusion at the intersection of 2<sup>nd</sup> Street and Front Street by realigning the southbound 2<sup>nd</sup> Street approach. The realignment improves the sight triangle looking west for the 2<sup>nd</sup> Street to Kents Ridge Road movement.

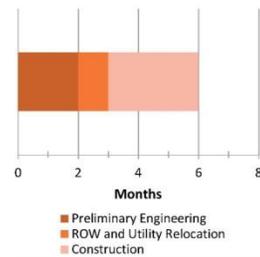
- Realign southbound 2<sup>nd</sup> Street inner lane to be perpendicular with Front Street

### Planning Level Cost Estimate

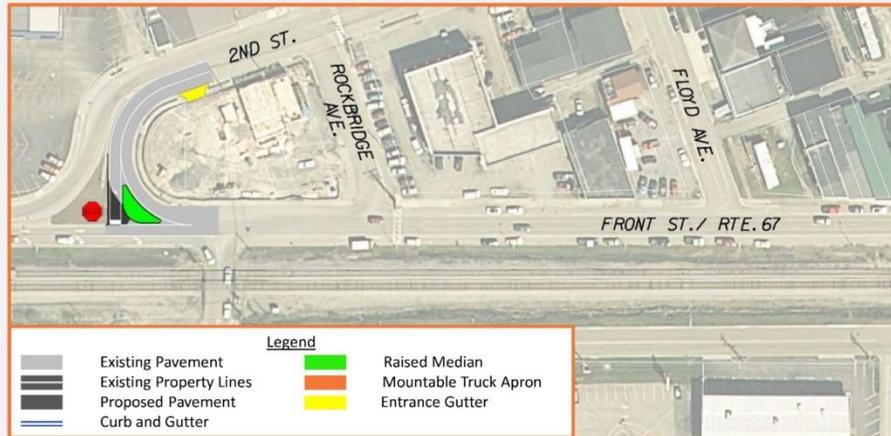
Phase	Planning Level Cost Estimate
Preliminary Engineering*	\$30,000
ROW and Utility Relocation	\$18,000
Construction	\$380,000
<b>Total Cost =</b>	<b>\$428,000</b>

Note: Cost estimates reported in 2017 dollars  
\*Preliminary Engineering assumes "No-Plan" project

### Project Schedule



### Conceptual Design Layout



**Legend**

- Existing Pavement (Grey)
- Existing Property Lines (Black)
- Proposed Pavement (Dark Grey)
- Curb and Gutter (Blue)
- Raised Median (Green)
- Mountable Truck Apron (Orange)
- Entrance Gutter (Yellow)



Southbound Approach on 2nd Street



Southbound Approach on 2nd Street

# Arterial Preservation Plan

Framework Document

# Framework Document

- Study Parameters
  - Working Group Members
  - Study Area
  - Level of Analysis
  - Public Meetings
  - Deliverables
  - Schedule
- Roles and responsibilities of study team members
  - Participation in working group meetings
  - Previous studies/plans/data
  - Timely review and comments on draft documents
  - Public meeting participation
  - Comprehensive Plan adoption
- Working group members “sign on the dotted line”

# Arterial Preservation Plan

## Communication Plan

# Communication Plan

- Public and Key Stakeholder Meetings
  - Study Team Participation
  - Potential Public Workshops
- Communication and Visualization Tools
  - Study Identifier
  - Contact List/Database Development
  - Project Website
  - Target Special Outreach
  - Communication Tools



## Arterial Preservation Program Draft Communication Plan

### 1. Introduction

The purpose of the Arterial Preservation Program is to preserve and enhance the capacity and safety along the Arterial Preservation Network. Under the Arterial Preservation Program, an Arterial Preservation Plan will be developed for each study corridor in the network. The Communication Plan will ensure that the evaluation of each study corridor will be conducted under the same procedures and include diverse audiences within the study area.

#### 1.1. Public Information Strategy

The public information strategy intends to educate, inform, and involve the public, businesses, localities, and agencies in the Arterial Preservation Program. The public information strategy will incorporate the following:

- General citizen input from residents in the area and other interested persons.
- Input from Virginia Department of Transportation (VDOT) Central Office, VDOT District Offices, VDOT Residencies, Metropolitan Planning Organizations (MPOs), Planning District Commissions (PDCs), and localities.
- Input from other stakeholders such as property owners in the area, business associations, and advocacy groups.

An effective and streamlined communication plan for each Arterial Preservation Plan is presented below. The program aims to meet the following goals:

- To inform and educate community groups, businesses, and the general public about the plan, its objectives, and outcomes.
- To encourage and gather input from community groups, businesses, and the general public regarding the issues to be studied within the study corridor, the alternatives, and the results.
- To create awareness and understanding of the Arterial Preservation Program, and the benefits and impacts that would result from the planning efforts.

#### 1.2. Outreach Team

The Outreach Team for each study corridor will be made up of representatives from the Consultant Team and the Study Team. A list of the contact information of each representative, including name, phone number, and email will be distributed to all members of the outreach team at the start of each project.

##### 1.2.1. Consultant Team

The Consultant Team for each study corridor will be made up of representatives from the prime contractor on the project and all sub-consultants.

# Arterial Preservation Plan

## Implementation Strategies

# Implementation Strategies

- SMART SCALE Funding
- HSIP Funding
- Revenue Sharing
- STARS Program
- Land Use Scenario Planning

Questions ?