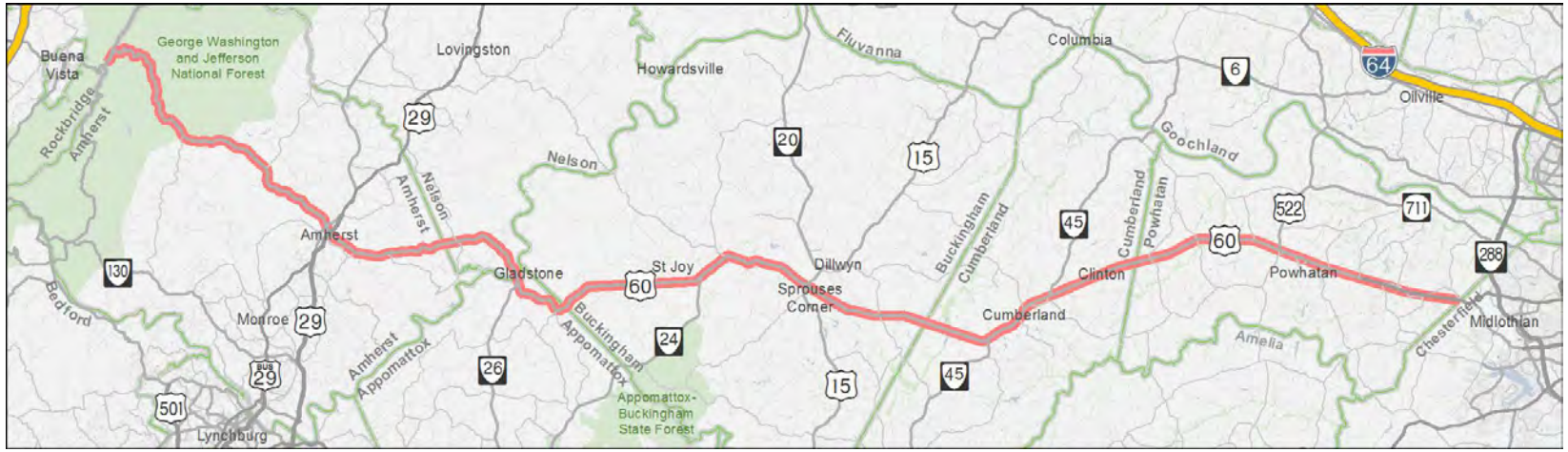
US 60 Corridor Study

March 26, 2019

Public Information Presentation



AGENDA

1. US 60 Study Scope and Goals
2. Arterial Management and Safety
3. US 60 Existing Arterial Conditions
4. Draft Recommendations Overview
5. Public Input

Study Participants

The following agencies comprise the list of Study Participants for this effort. Representatives from each agency were invited to the US 60 Corridor Study Stakeholder Meetings and provided guidance and input to VDOT and the study consultant during the planning process.

- Powhatan County
- Cumberland County
- Nelson County
- Appomattox County
- Buckingham County
- Amherst County
- Richmond Regional Planning District Commission
- Commonwealth Regional Council
- Central Virginia Planning District Commission
- Thomas Jefferson Planning District Commission
- Virginia Department of Transportation
- Michael Baker International *(study consultant)*

Purpose of Study

To identify recommendations for priority intersections and segments along the corridor that ensure safety while preserving and improving the capacity of US 60 without wide scale road widenings while also accommodating economic development

The Study will identify recommendations to:

- **Result in a safer corridor**
- **Preserve and enhance corridor capacity and efficiency**
- **Maintain Commonwealth's mobility & thus economic competitiveness**
- **Lower long-term infrastructure capital and maintenance costs**

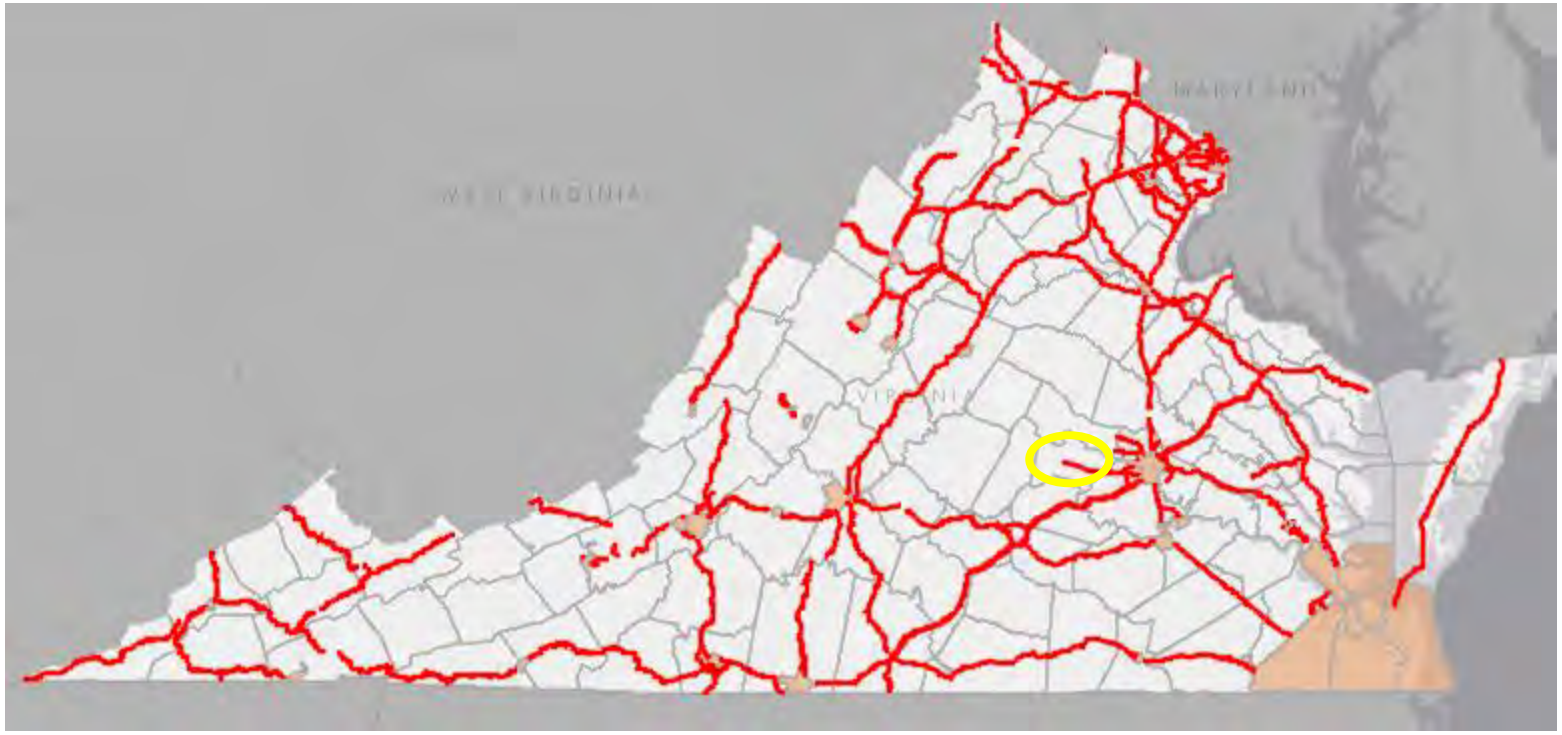
Scope of Work

Key Points

1. **The Study will analyze intersections and 14 miles of segments along the corridor for the development of detailed recommendations. Study locations to be determined by:**
   a. Historic traffic volumes
   b. Potential for safety improvement (PSI) score (As calculated by VDOT)
   c. Crash history
   d. Stakeholder input
2. **The Study assumes a horizon year of 2040. The horizon year represents the last year of the projection period for need determinations.**
3. **Arterial Preservation techniques will be applied where feasible in accordance with VDOT's Arterial Preservation Program**
4. **The Study will identify opportunities to improve roadway geometrics and access management**
5. **The Study will address the existing and future capacity of US 60**
6. **In response to citizen feedback received through the public input process, VDOT requested the completion of a Roadway Safety Audit (RSA) for the two-lane segment of US 60 between US 522 and State Route 601**

Arterial Preservation

A portion of US 60 study corridor lies on VDOT's Arterial Preservation Network:



This segment will be analyzed in accordance with VDOT's Arterial Preservation Program - http://www.virginiadot.org/programs/vdot_arterial_preservation_program.asp

Arterial Preservation

Program Goals

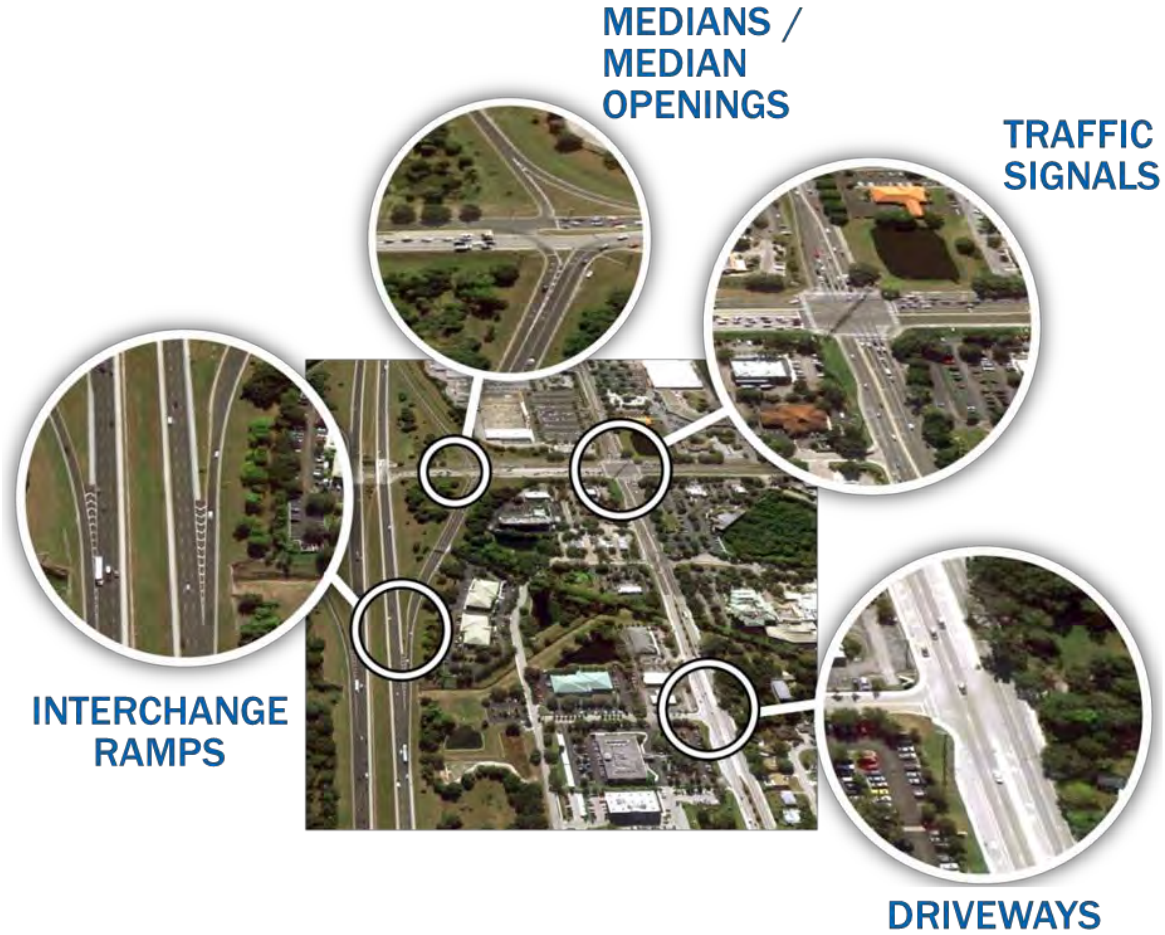
To preserve and enhance the capacity of arterials and VDOT maintained routes of the National Highway System while ensuring that:

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

Preservation and enhancement strategies will promote the use of innovative transportation solutions that minimize delays for through traffic and improve safety while considering local economic development goals.

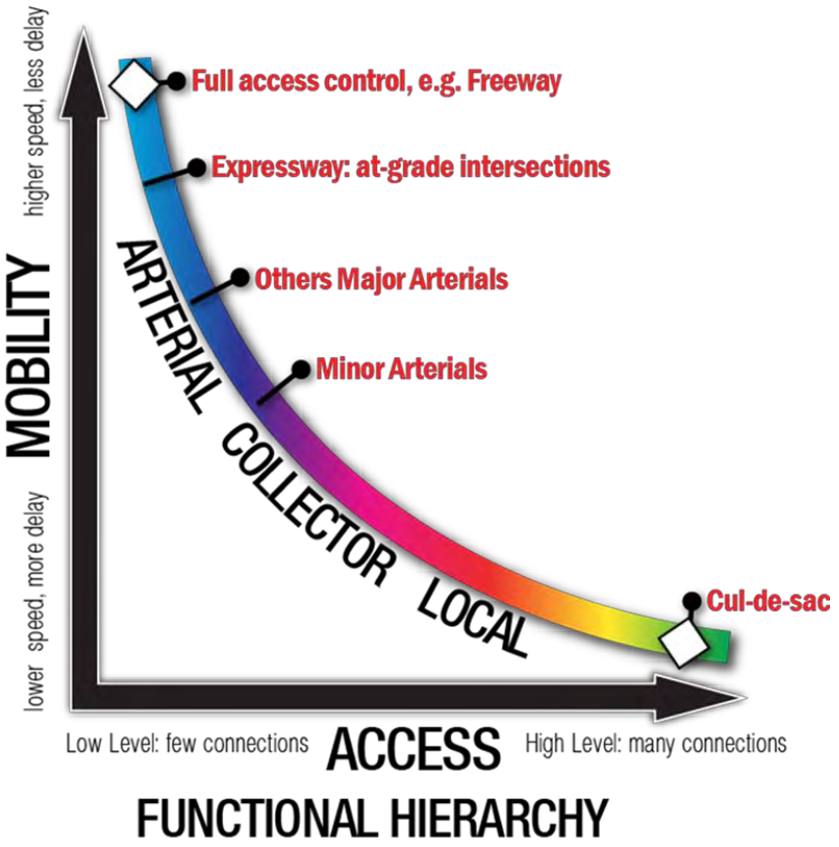
What is Access Management?

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



Guiding Principles

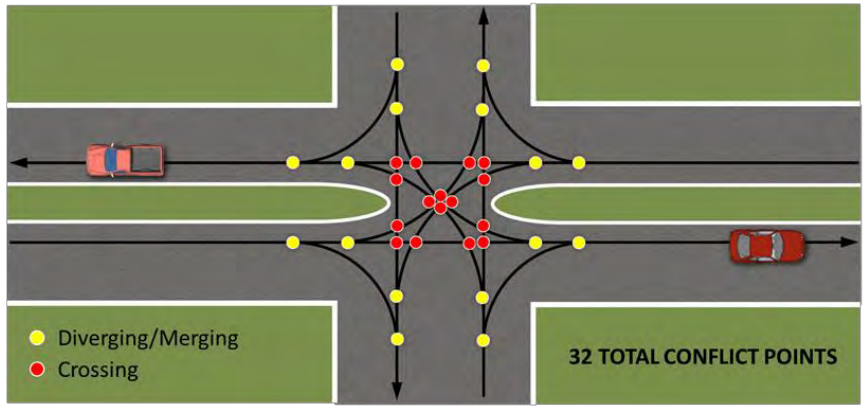
- Limit the number of conflict points
- Separate conflict points
  - Reduce the number of median openings
  - Provide directional median openings
  - Improve driveway design
  - Consolidate driveways to reduce frequency
- Look at conflict points from a network perspective



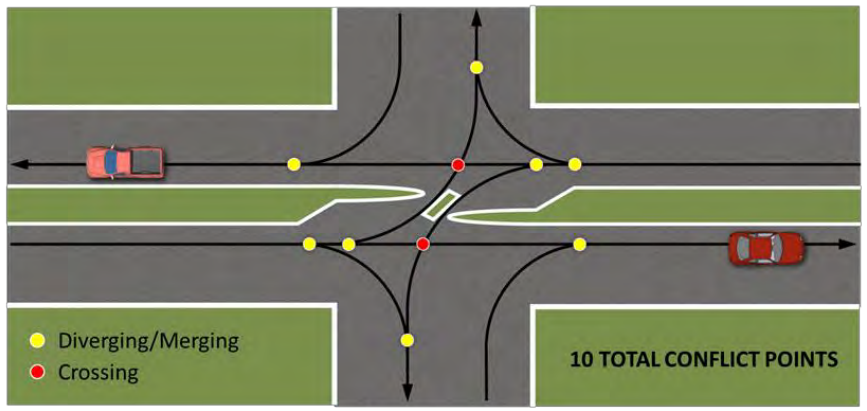
Arterial Preservation

Access Management – Conflict Points

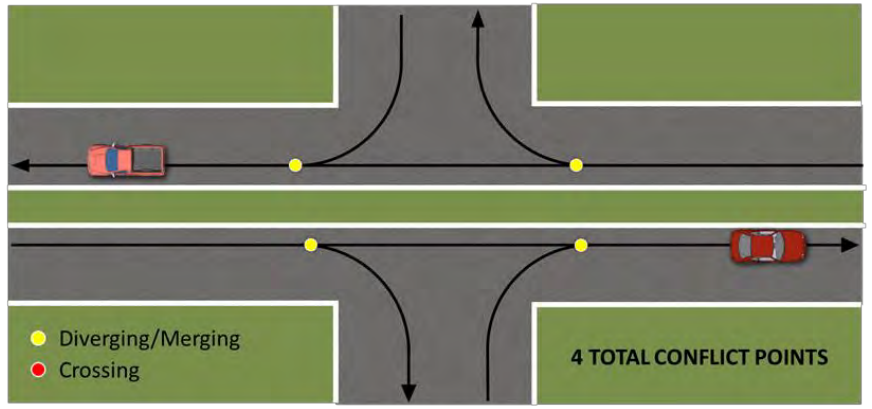
FULL UNSIGNALIZED MEDIAN OPENING



DIRECTIONAL MEDIAN OPENING

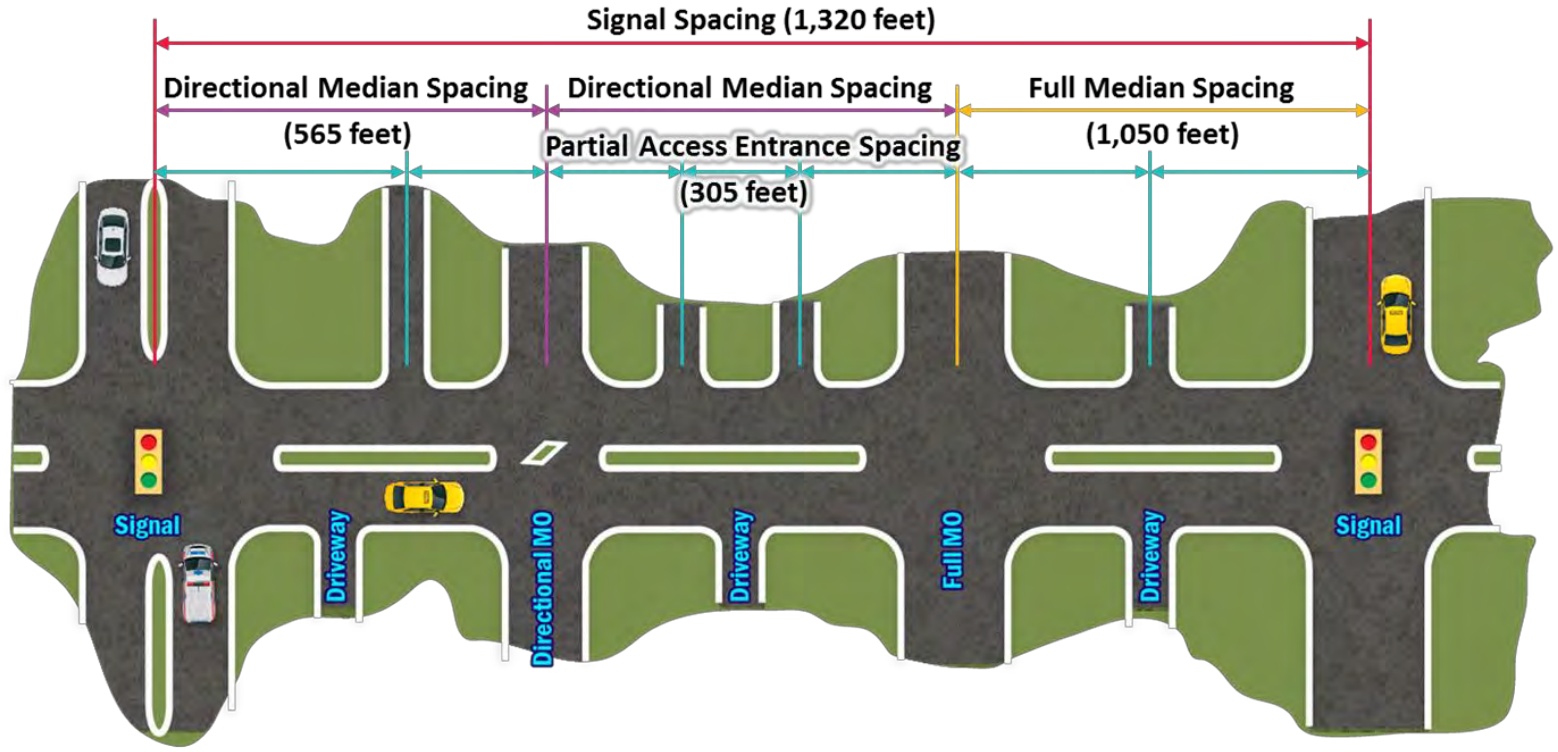


RIGHT-IN/RIGHT-OUT DRIVEWAY



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

45



Arterial Preservation

Access Management Benefits

Increased Signal Spacing Benefits

- Improves traffic flow
- Reduces congestion
- Improves air quality

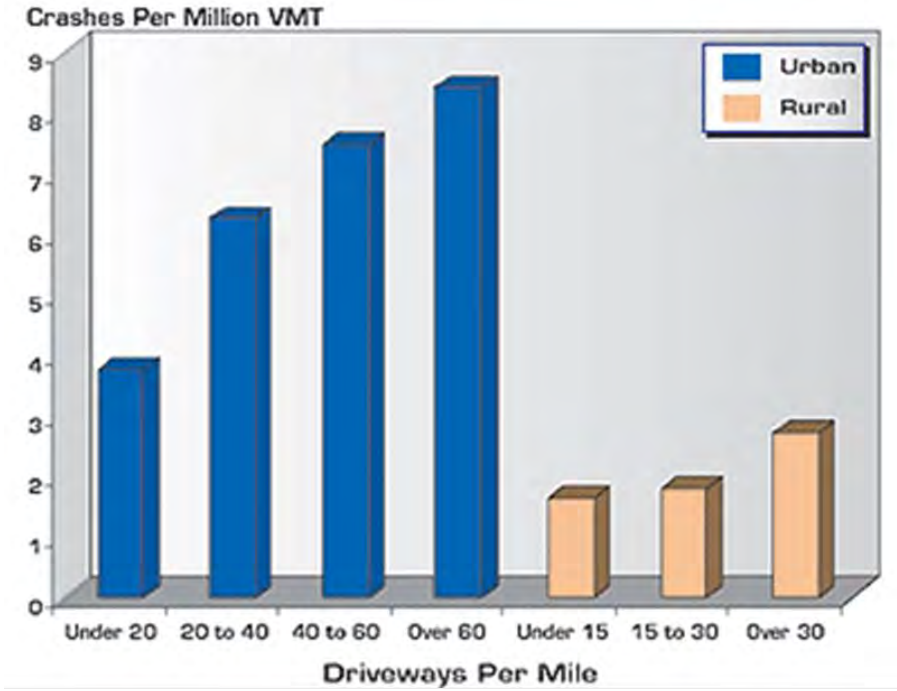
Signals per Mile	Increase in Travel Time (%)
2	-
3	9
4	16
5	23
6	29
7	34
8	39

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

Increased Driveway Spacing Benefits

- Reduces number of potential conflicts
- Increases roadway speeds
- Reduces the rate of car crashes

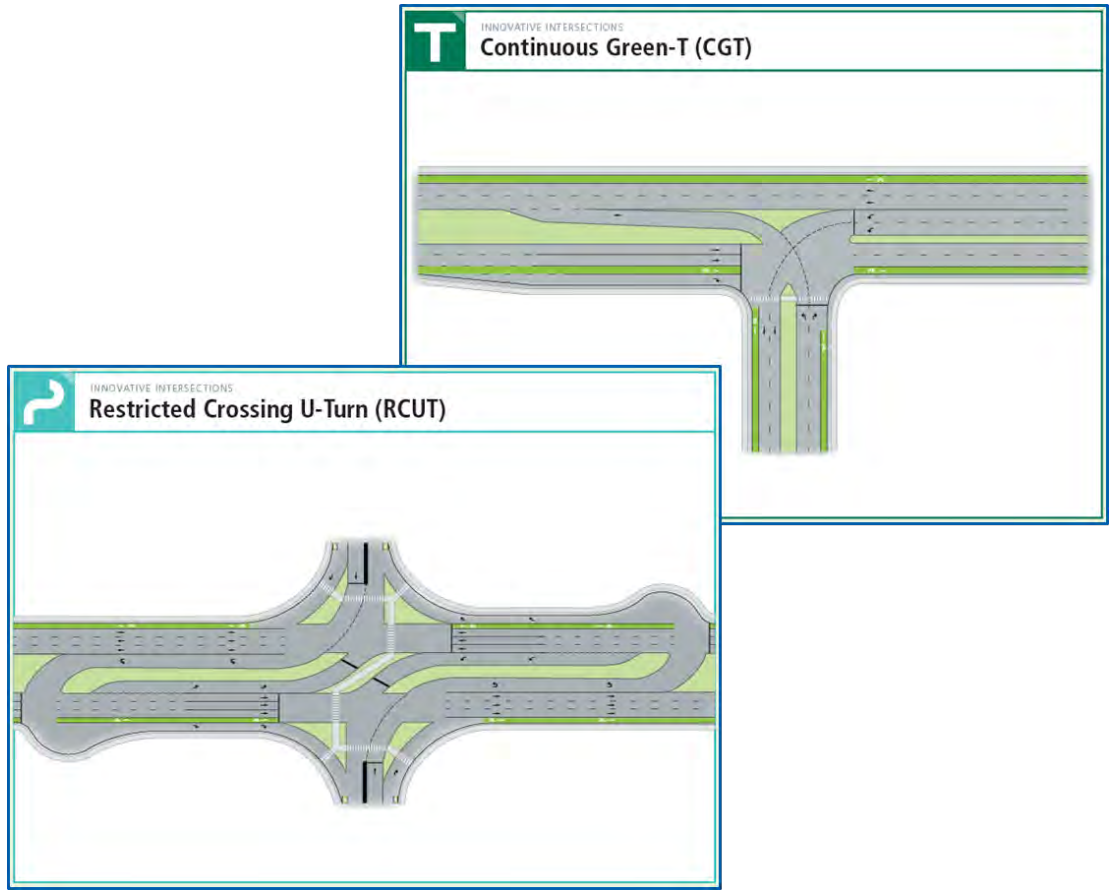


Source: Federal Highway Administration (FHWA)
https://ops.fhwa.dot.gov/access_mgmt/docs/benefits_am_trifold.htm

Arterial Preservation

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



Re-Route Left Turn Movements

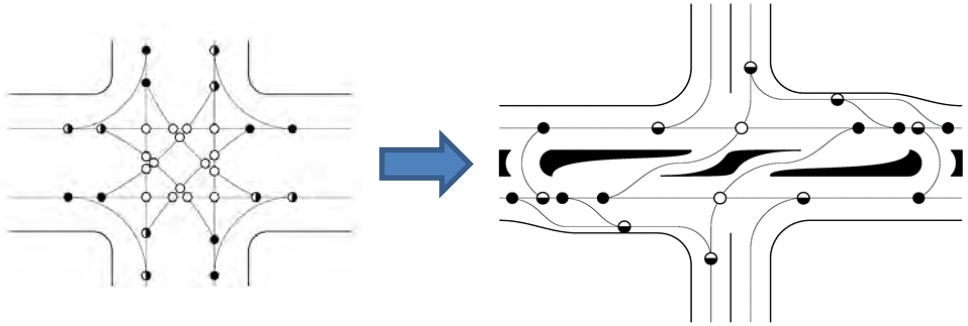
- More efficiently serves through traffic

Reduce Signal Phases

- Reduces delay

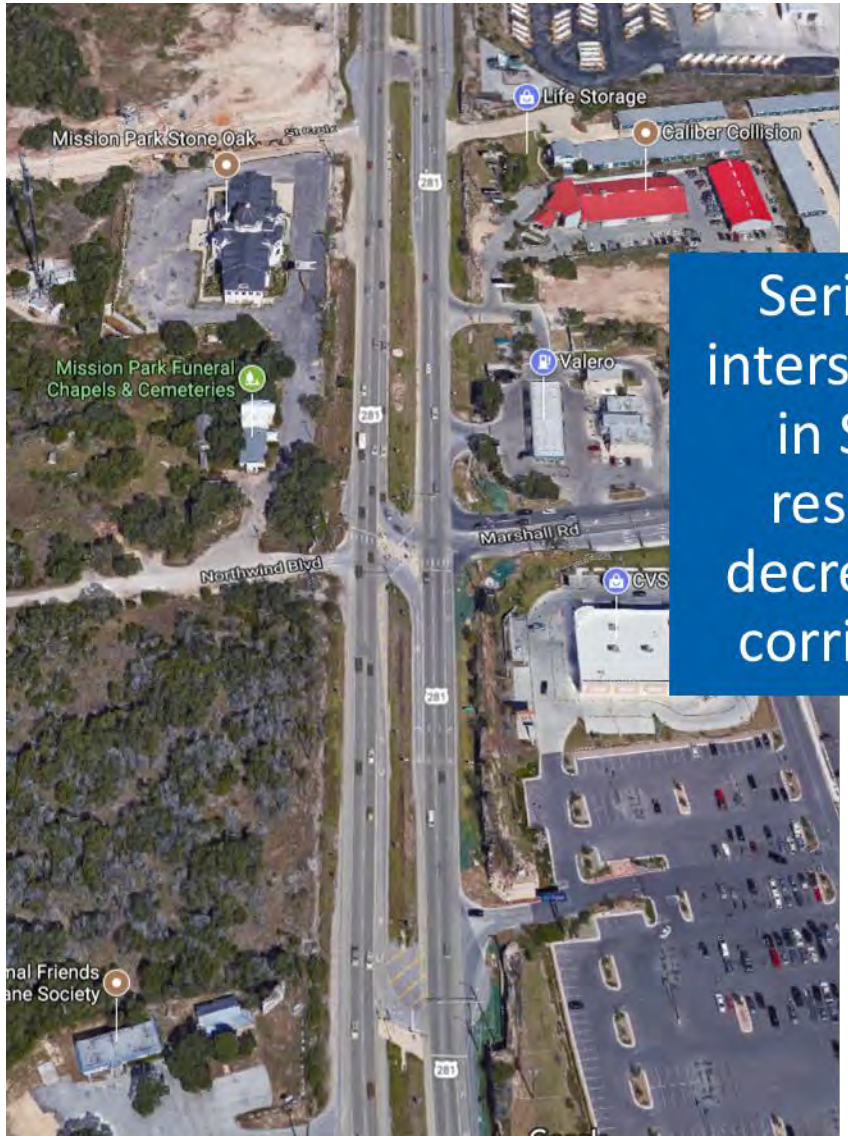
Remove and Separate Conflicts

- Improves Safety

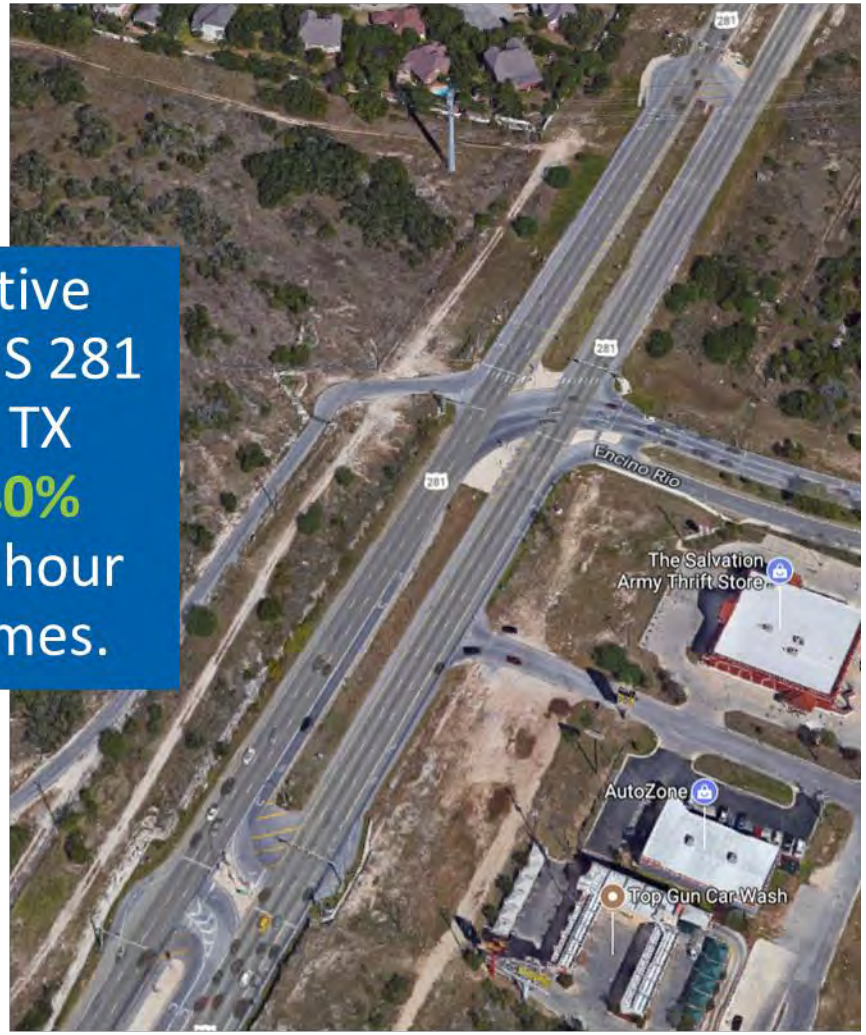


Arterial Preservation

Innovative Intersection Benefits



Series of innovative intersections on US 281 in San Antonio, TX resulted in **34-40%** decrease in peak hour corridor travel times.



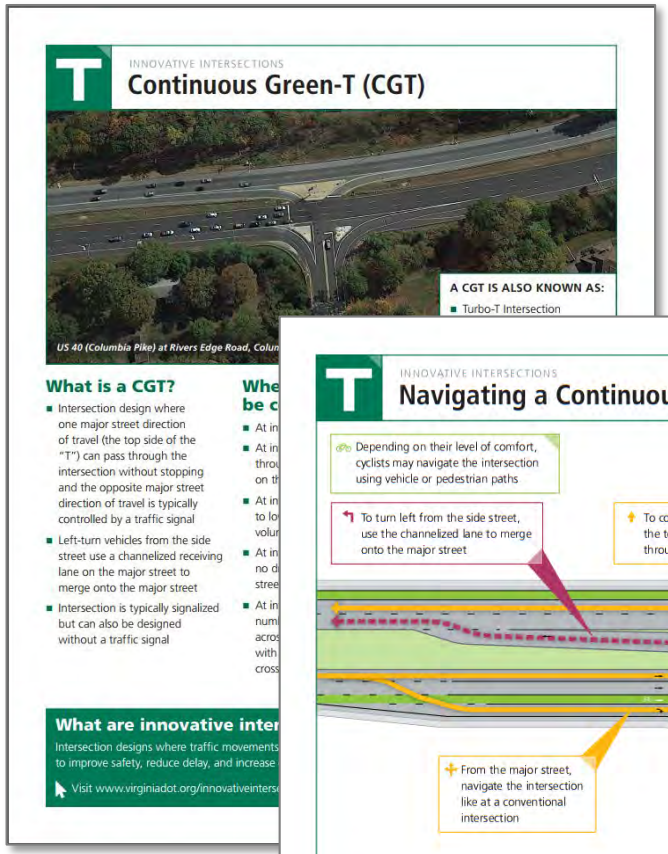
Arterial Preservation

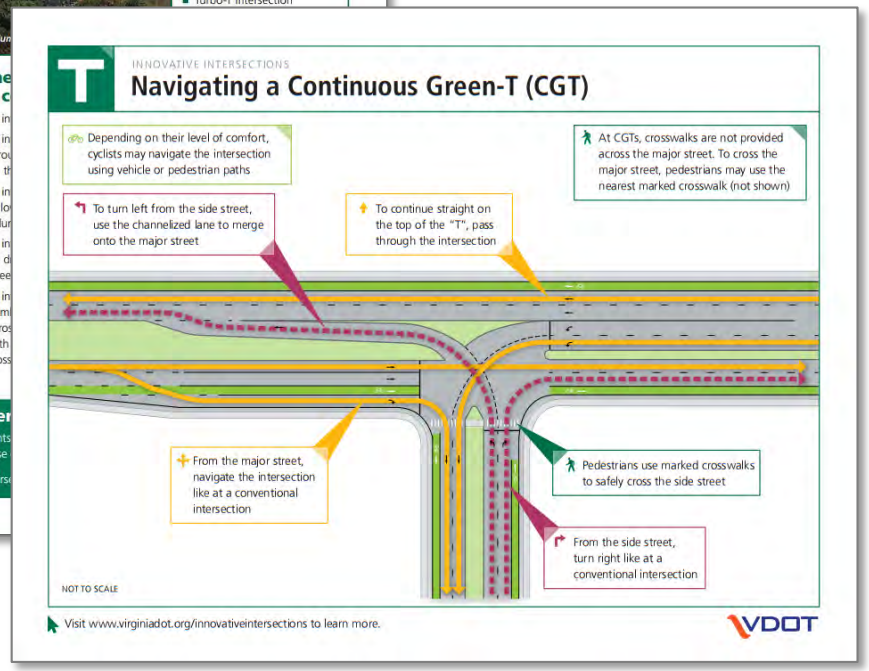
Innovative Intersection Benefits

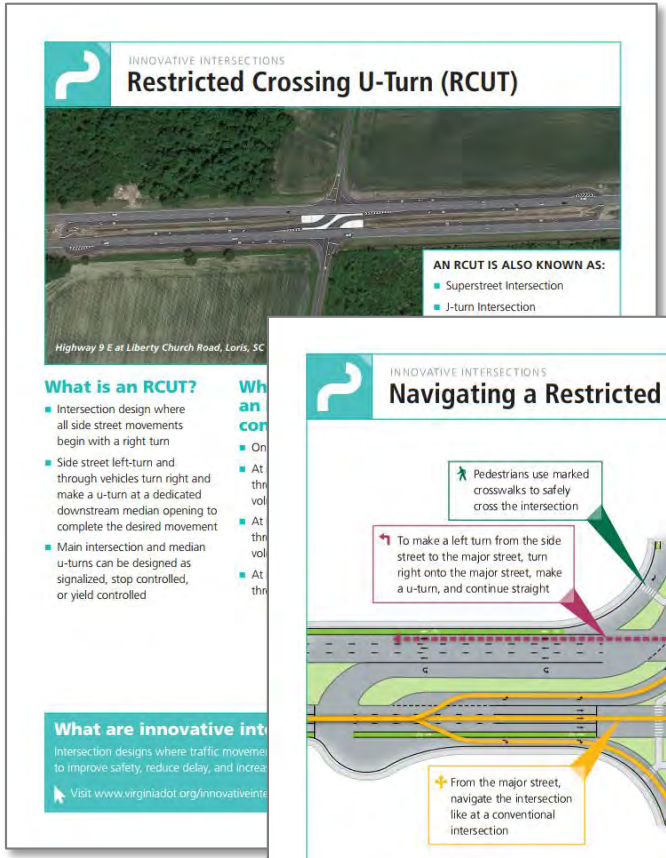
Safety analysis of RCUT intersections with stop signs in NC found that fatal and injury, angle, and left-turn crashes decreased by more than half following RCUT installation.

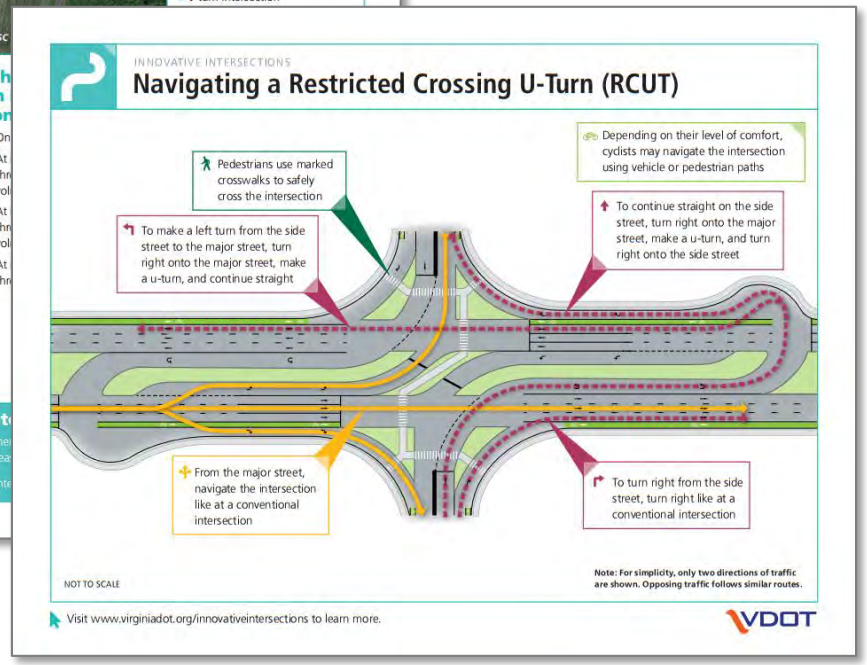
Arterial Preservation

Innovative Intersection Resources









For more information visit: http://www.virginiadot.org/innovativeintersections

US 60 Existing Arterial Conditions

Reliability (Travel Time Index)

Travel Time Index

A Travel Time Index measures congestion and reliability by comparing trip durations for different periods (Peak and Off-Peak).

Congested

Peak Period — 60 Min Trip — **7-9 am, 4-6 pm**

2.0

If a trip during the peak period takes **twice as long** as the off-peak period, then the TTI is 2.

Uncongested

Off Peak Period — 30 Min Trip

1.0

An uncongested trip as measured during the off-peak period has a TTI of 1.

Peak periods for the US 60 Corridor Study were identified in accordance with accepted methodology established by VDOT.

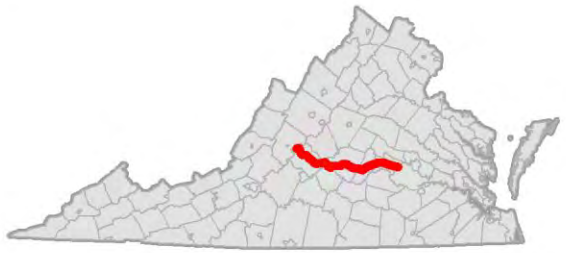
Travel Time Index, 2016

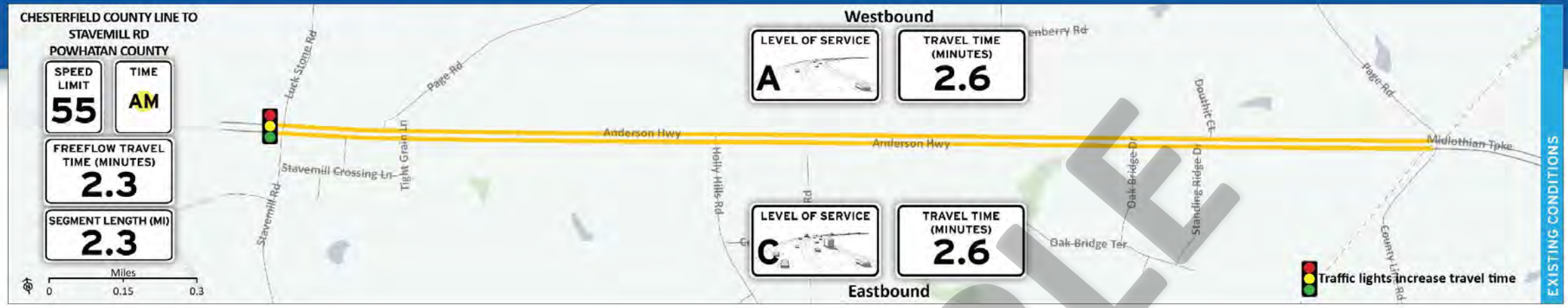
(Peak Period)

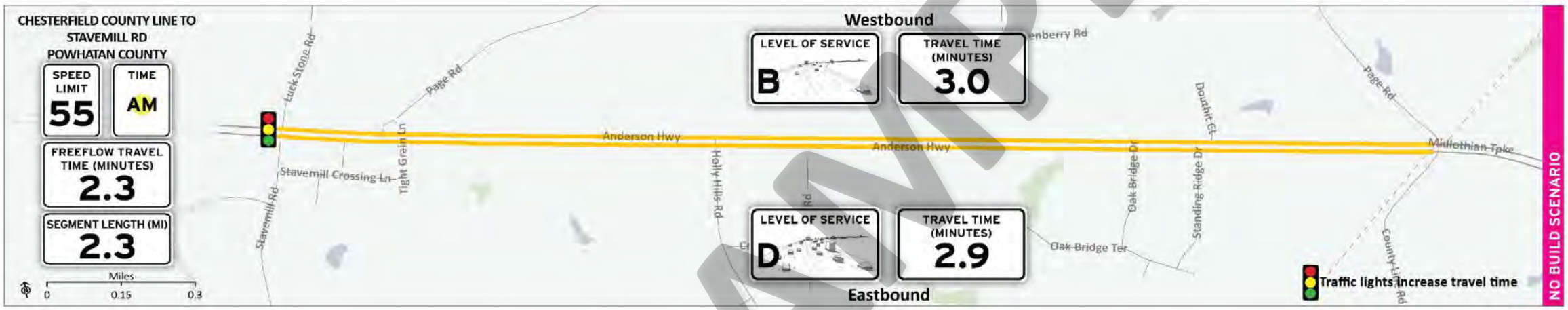
- >1.51 (>50%)
- 1.26 - 1.50 (26%-50%)
- 1.11 - 1.25 (11%-25%)
- 1.06 - 1.10 (6%-10%)
- <1.05 (<5%)

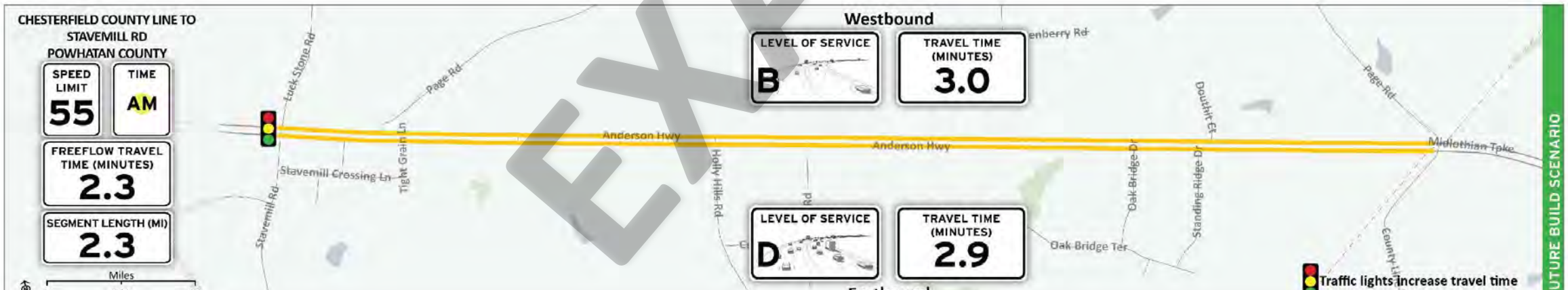
N

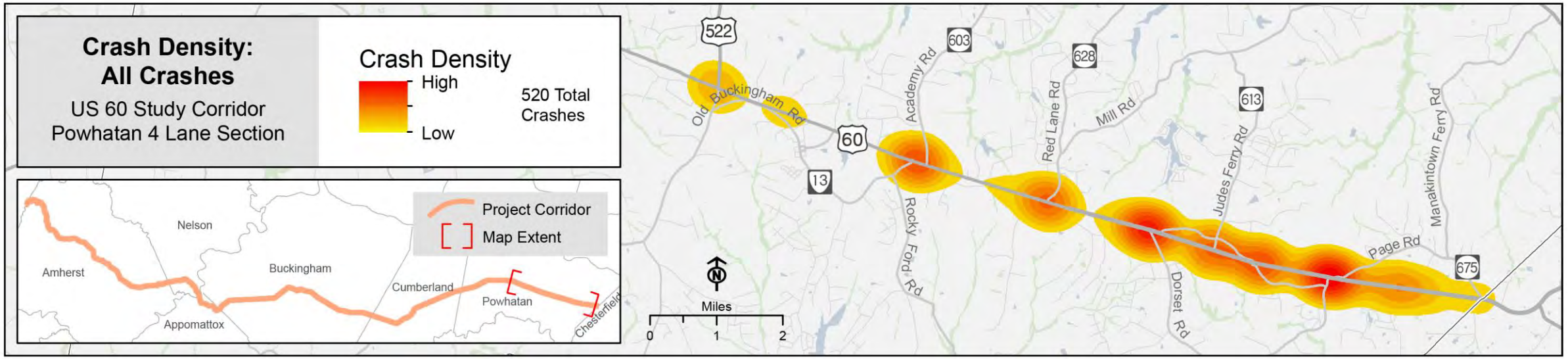
Miles
0 5 10

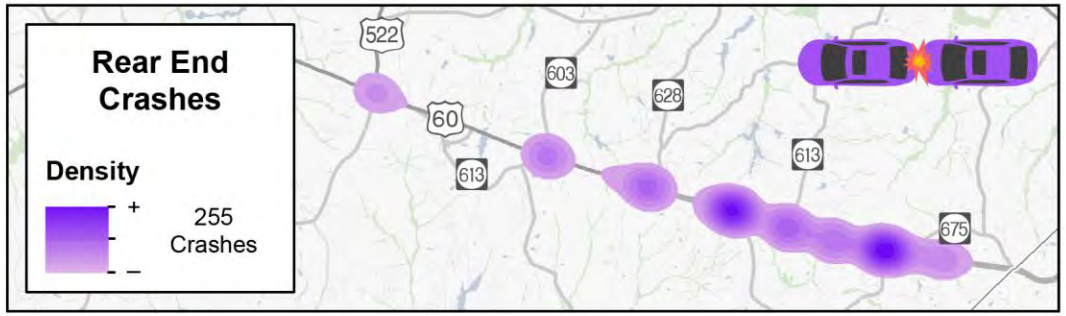


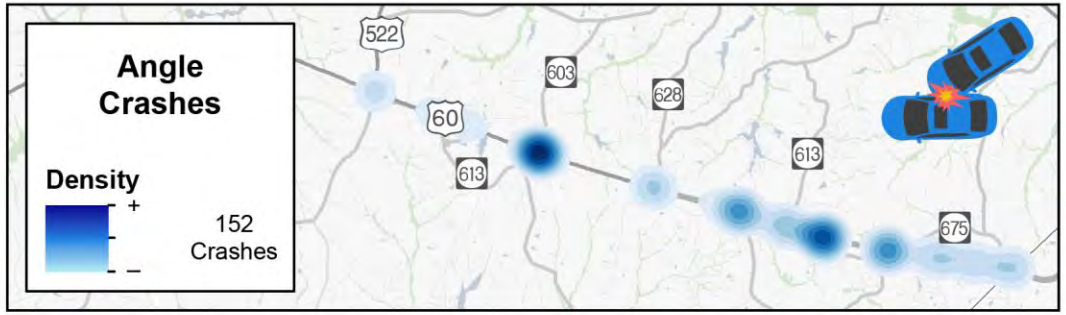

CHESTERFIELD COUNTY LINE TO
STAVEMILL RD
POWHATAN COUNTY
SPEED LIMIT
55
TIME
AM
FREEFLOW TRAVEL TIME (MINUTES)
2.3
SEGMENT LENGTH (MI)
2.3
Miles
0
0.15
0.3
Westbound
LEVEL OF SERVICE
A
TRAVEL TIME (MINUTES)
2.6
LEVEL OF SERVICE
C
TRAVEL TIME (MINUTES)
2.6
Eastbound
Anderson Hwy
Anderson Hwy
Page Rd
Luck Stone Rd
Stavemill Crossing Ln
Tight Grain Ln
Stavemill Rd
Holly Hills Rd
Oak Bridge Dr
Standing Ridge Dr
Doubhit Ct
Oak Bridge Ter
Midlothian Tpke
County Line Rd
Traffic lights increase travel time
EXISTING CONDITIONS

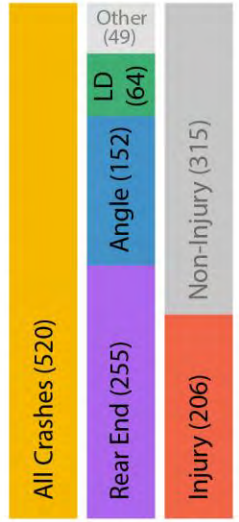

CHESTERFIELD COUNTY LINE TO
STAVEMILL RD
POWHATAN COUNTY
SPEED LIMIT
55
TIME
AM
FREEFLOW TRAVEL TIME (MINUTES)
2.3
SEGMENT LENGTH (MI)
2.3
Miles
0
0.15
0.3
Westbound
LEVEL OF SERVICE
B
TRAVEL TIME (MINUTES)
3.0
LEVEL OF SERVICE
D
TRAVEL TIME (MINUTES)
2.9
Eastbound
Anderson Hwy
Anderson Hwy
Page Rd
Luck Stone Rd
Stavemill Crossing Ln
Tight Grain Ln
Stavemill Rd
Holly Hills Rd
Oak Bridge Dr
Standing Ridge Dr
Doubhit Ct
Oak Bridge Ter
Midlothian Tpke
County Line Rd
Traffic lights increase travel time
NO BUILD SCENARIO

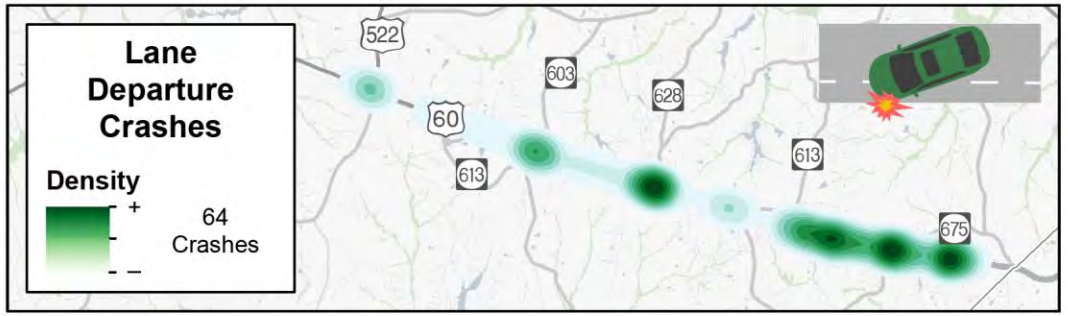

CHESTERFIELD COUNTY LINE TO
STAVEMILL RD
POWHATAN COUNTY
SPEED LIMIT
55
TIME
AM
FREEFLOW TRAVEL TIME (MINUTES)
2.3
SEGMENT LENGTH (MI)
2.3
Miles
Westbound
LEVEL OF SERVICE
B
TRAVEL TIME (MINUTES)
3.0
LEVEL OF SERVICE
D
TRAVEL TIME (MINUTES)
2.9
Anderson Hwy
Anderson Hwy
Page Rd
Luck Stone Rd
Stavemill Crossing Ln
Tight Grain Ln
Stavemill Rd
Holly Hills Rd
Oak Bridge Dr
Standing Ridge Dr
Doubhit Ct
Oak Bridge Ter
Midlothian Tpke
County Line Rd
Traffic lights increase travel time
FUTURE BUILD SCENARIO

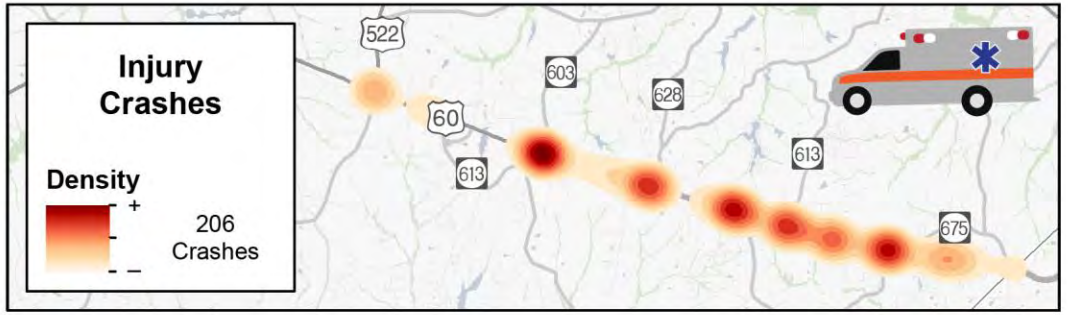

Crash Density:
All Crashes
US 60 Study Corridor
Powhatan 4 Lane Section
Crash Density
High
Low
520 Total Crashes
Project Corridor
Map Extent
Nelson
Amherst
Buckingham
Cumberland
Powhatan
Appomattox
Chesterfield
Old Buckingham Rd
Academy Rd
Red Lane Rd
Mill Rd
Judes Ferry Rd
Manakintown Ferry Rd
Rocky Ford Rd
Dorset Rd
Page Rd
522
603
628
613
60
13
675
Miles
0
1
2


Rear End Crashes
Density
255 Crashes
522
603
628
60
613
613
675

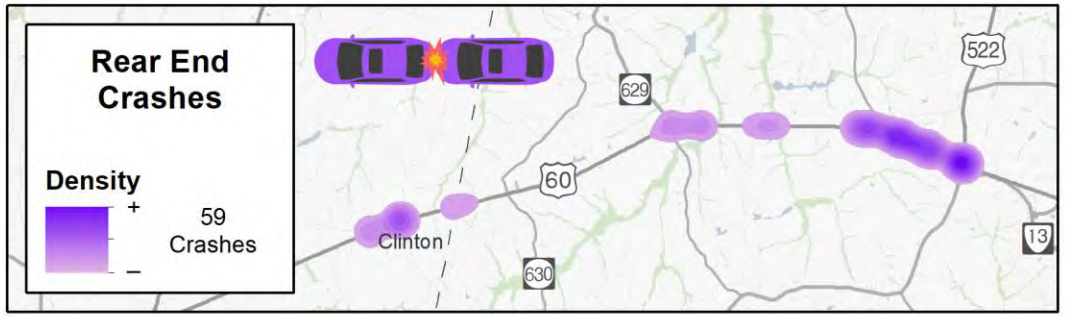

Angle Crashes
Density
152 Crashes
522
603
628
60
613
613
675

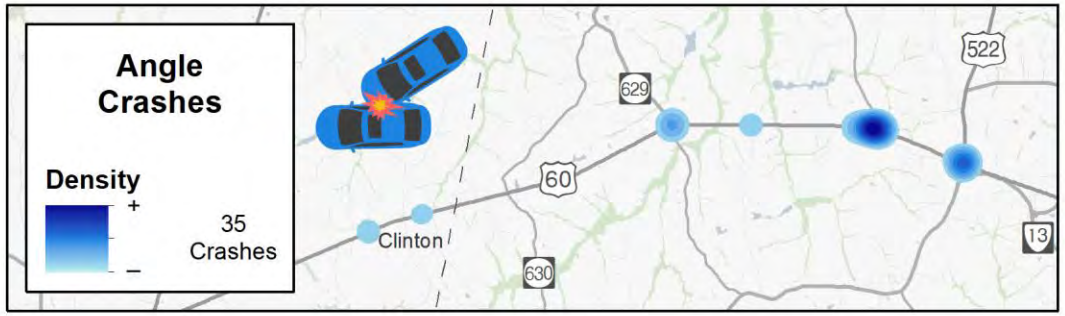

All Crashes (520)
Rear End (255)
Angle (152)
LD (64)
Other (49)
Injury (206)
Non-Injury (315)
Type of Crash (Amount)

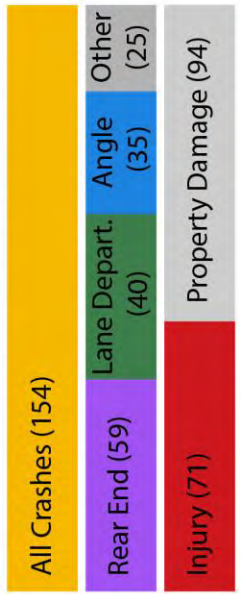

Lane Departure Crashes
Density
64 Crashes
522
603
628
60
613
613
675

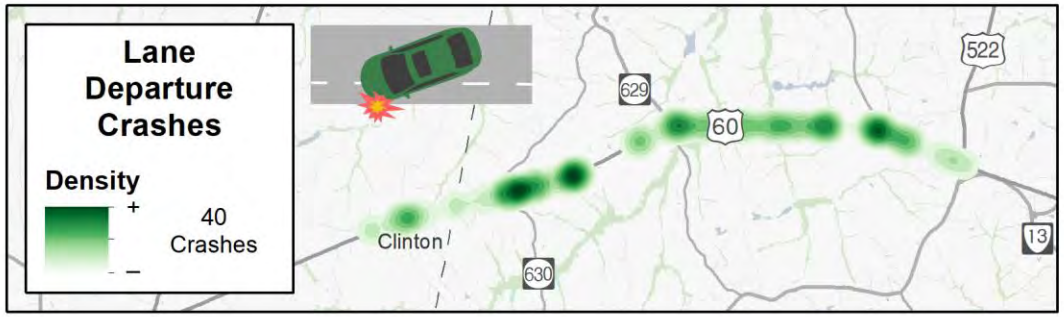

Injury Crashes
Density
206 Crashes
522
603
628
60
613
613
675

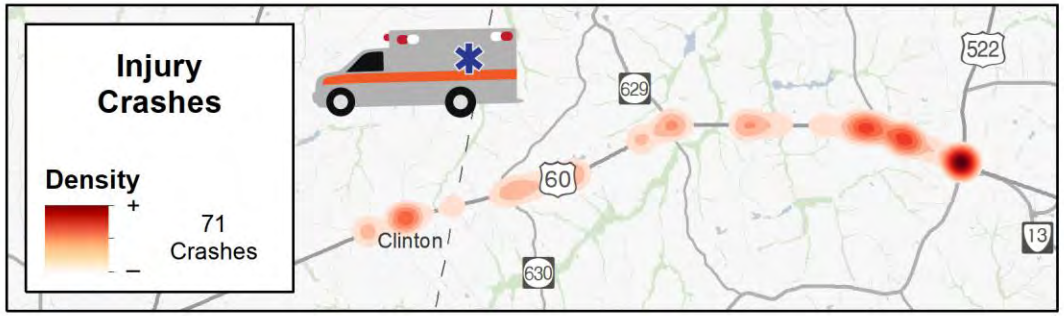

Crash Density:
All Crashes
US 60 Safety Audit Segment
(US 60 from SR 601 to US 522)
Crash Density
High
Low
154 Total Crashes
Project Corridor
Map Extent
Nelson
Amherst
Buckingham
Powhatan
Appomattox
Cumberland
Chesterfield
Clinton Rd
Clinton
Cumberland
Powhatan
Ballsville Rd
630
60
Old Tavern Rd
629
Bell Rd
522
Maidens Rd
Old Buckingham Rd
13
N
Miles
0
1
2

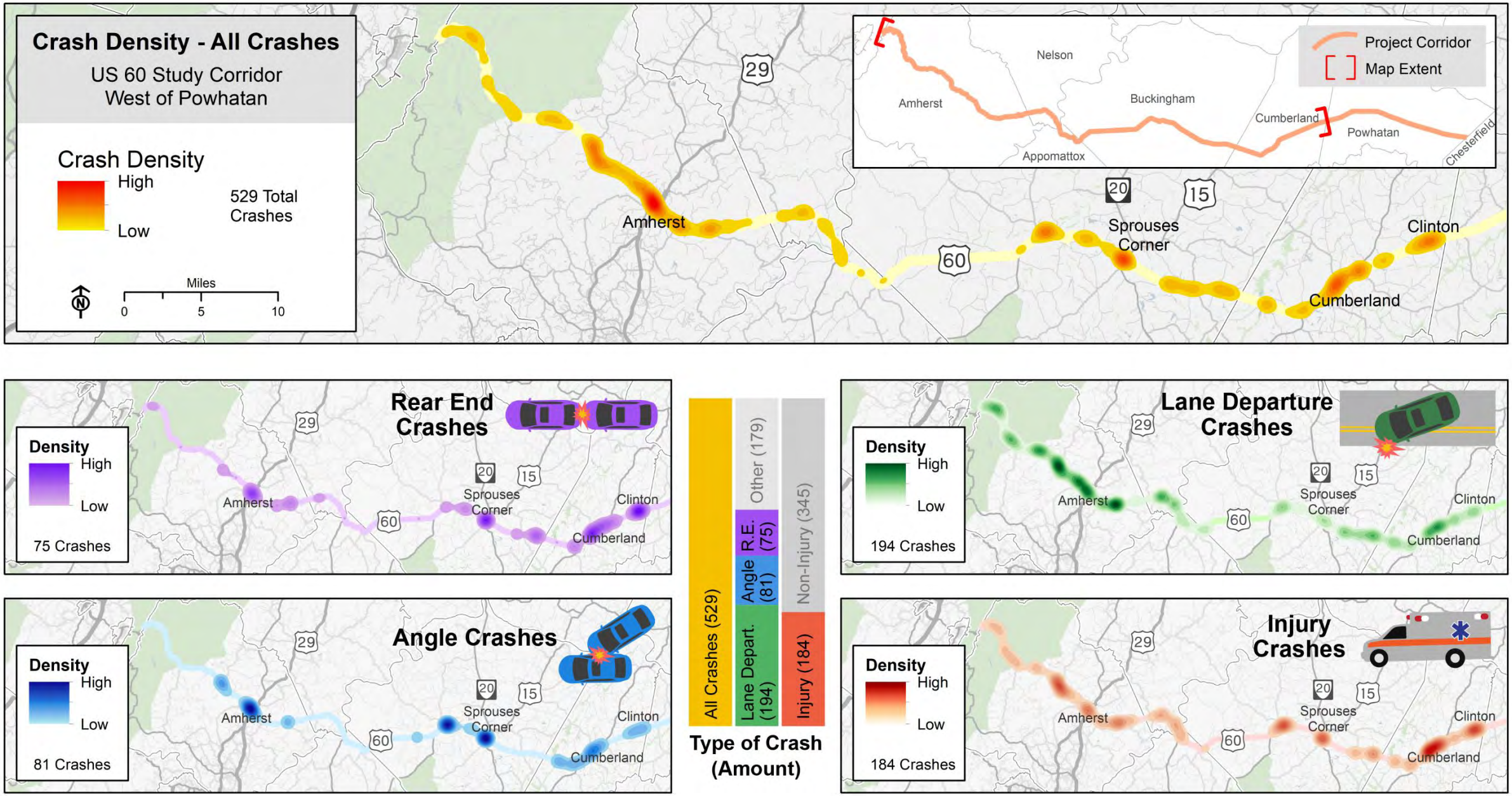

Rear End Crashes
Density
59 Crashes
Clinton
522
629
60
630
13


Angle Crashes
Density
35 Crashes
Clinton
522
629
60
630
13

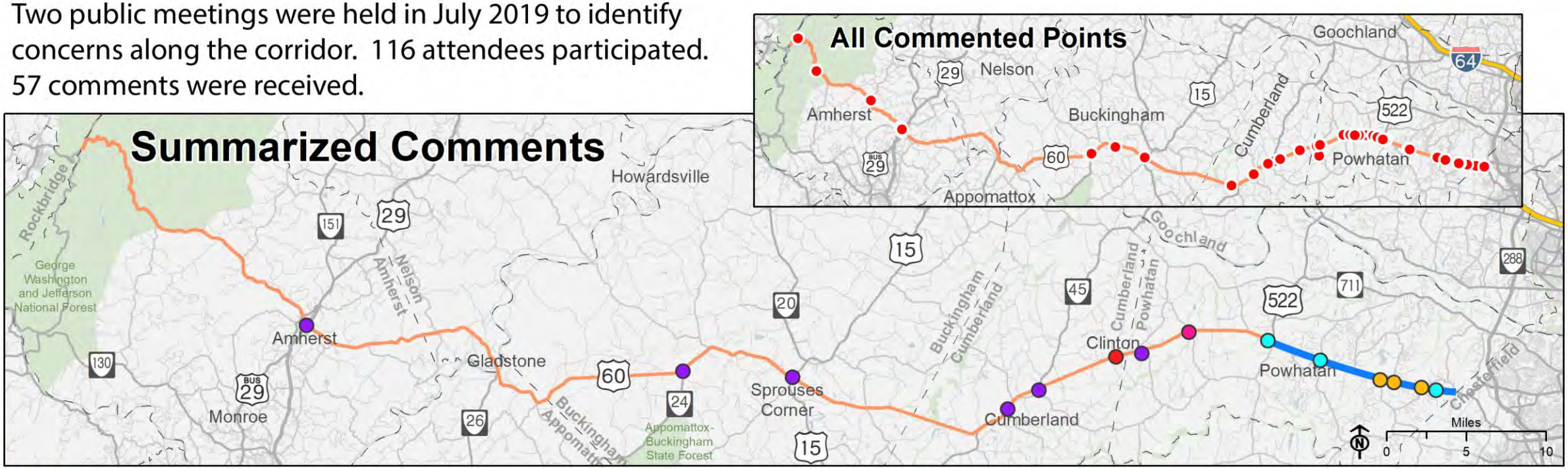

All Crashes (154)
Other (25)
Angle (35)
Lane Depart. (40)
Rear End (59)
Property Damage (94)
Injury (71)
Type of Crash (Amount)


Lane Departure Crashes
Density
40 Crashes
Clinton
522
629
60
630
13


Injury Crashes
Density
71 Crashes
Clinton
522
629
60
630
13


Crash Density - All Crashes
US 60 Study Corridor
West of Powhatan
Crash Density
High
Low
529 Total Crashes
Miles
0
5
10
Project Corridor
Map Extent
Nelson
Amherst
Buckingham
Cumberland
Powhatan
Appomattox
Chesterfield
29
20
15
60
Amherst
Sprouses Corner
Clinton
Cumberland
Rear End Crashes
Density
High
Low
75 Crashes
Lane Departure Crashes
194 Crashes
Angle Crashes
81 Crashes
Injury Crashes
184 Crashes
All Crashes (529)
Other (179)
R.E. (75)
Angle (81)
Lane Depart. (194)
Non-Injury (345)
Injury (184)
Type of Crash (Amount)

Two public meetings were held in July 2019 to identify concerns along the corridor. 116 attendees participated. 57 comments were received.



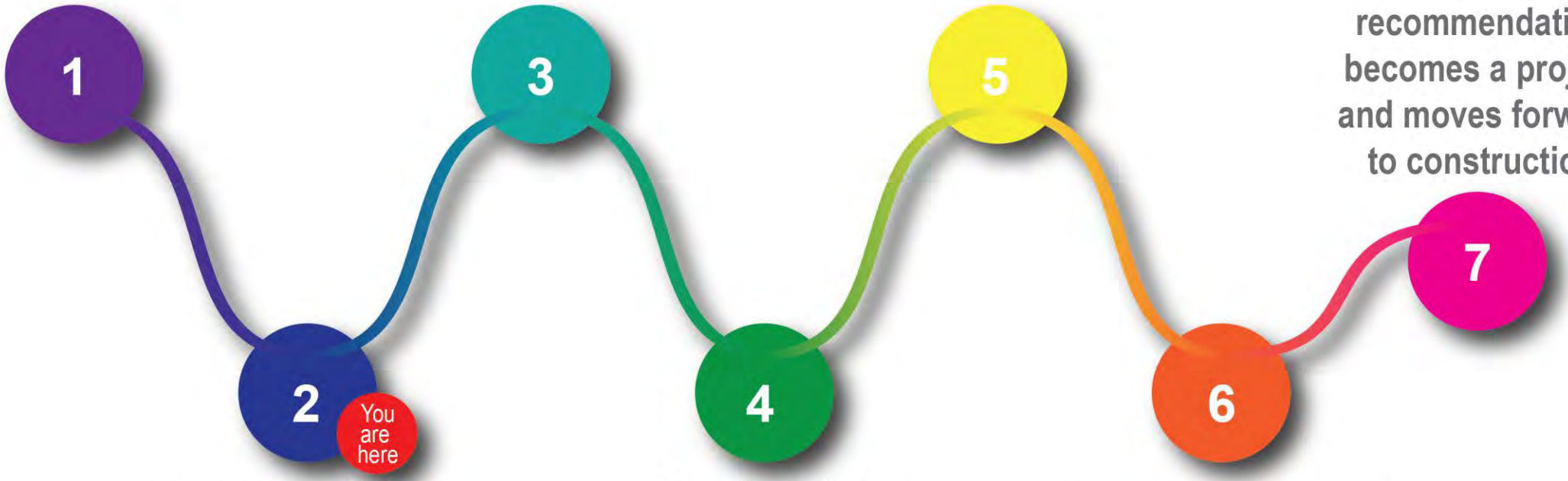
1. Turn lanes throughout Powhatan's four lane segment were marked as being too short.
2. The intersections at Luck Stone Road, Jude's Ferry Road, and Dorset Road were identified as areas of congestion. Signals at these locations were noted as having insufficient green time.
3. The intersection at Old Buckingham Road, the intersections of Holly Hills Road and Dogwood Road, and the merge point at Pocahontas Middle School were noted as having safety issues.
4. The intersection at Old Tavern Road/Trenholm Road was highlighted as a major concern. Comments noted the lack of turn lanes, poor visibility, high speeds, and access issues as the primary factors in the safety issues at this intersection.
5. The intersections of Ballsville Road, Northfield Road, and Mt Rush Highway were identified as having safety concerns. Movement issues within Cumberland, Sprouses Corner, and the Town of Amherst were noted as needing improvement.
6. The uncertainty of the landfill site and its impact on US 60.

Draft Recommendations Overview

From a Recommendation to a Project

*Certain safety countermeasures can be implemented more quickly

1. Recommendations are vetted through a planning process
2. Recommendations are presented to the public for review (You are here)
3. The local government approves a resolution supporting the recommendation
4. An appropriate funding source is identified
5. An application is made for funding
6. The recommendation is evaluated for funding
7. If selected, the recommendation becomes a project and moves forward to construction

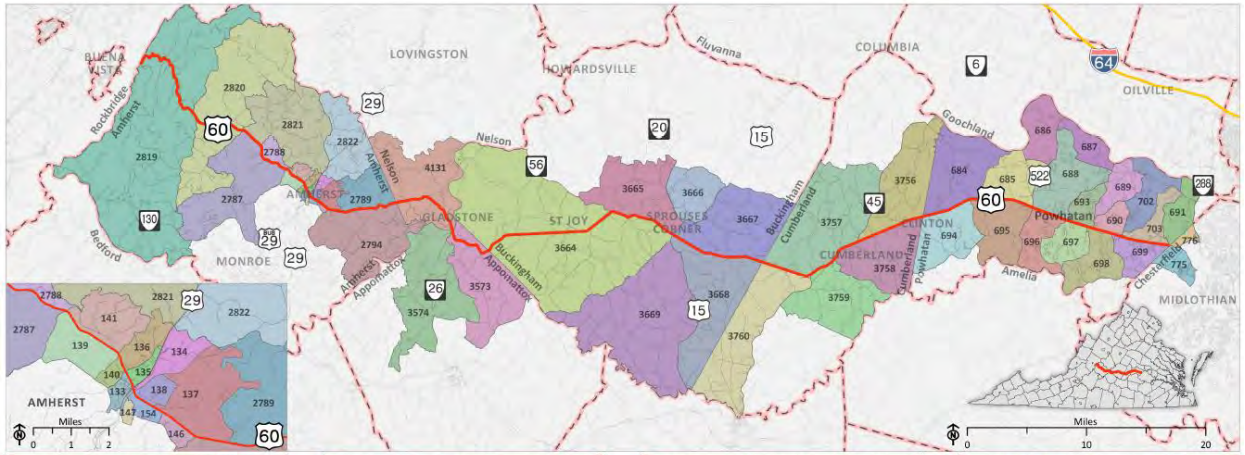


Development of Recommendations

Taken into account:

- **Existing conditions**
  - Traffic
  - Safety
- **Future land use**
- **Travel demand model**
- **Public comments / stakeholder feedback**
- **Planned improvements**

Future Growth by Traffic Analysis Zone



Amherst County Urbanized Area (2017-2045)

TAZ ID	Population Growth	Household Growth	Employment Growth
133	-19	0	116
134	0	0	0
135	0	0	29
136	0	0	14
137	0	0	10
138	0	0	14
139	0	0	0
140	64	42	34
141	2	1	0
146	0	0	0
147	46	23	0
154	-14	0	92

Amherst, Appomattox, and Nelson Counties (2017-2045)

TAZ ID	Population Growth	Household Growth	Employment Growth
2787	199	38	96
2788	131	48	1426
2789	122	37	373
2794	129	41	18
2819	246	88	84
2820	158	54	110
2821	213	74	89
2822	234	83	33
3573	214	82	6
3574	257	93	121
4131	127	47	22

Buckingham and Cumberland Counties (2017-2045)

TAZ ID	Population Growth	Household Growth	Employment Growth
3664	410	97	262
3665	235	54	65
3666	576	27	144
3667	394	89	1052
3668	219	52	111
3669	287	67	97
3756	214	49	40
3757	274	66	219
3758	214	49	18
3759	228	54	43
3760	329	86	63

Chesterfield and Powhatan Counties (2017-2045)

TAZ ID	Population Growth	Household Growth	Employment Growth
684	514	198	8
685	636	245	69
686	170	65	22
687	154	59	2
688	1312	505	146
689	593	228	23
690	398	153	42
691	458	176	10
693	755	290	38
694	754	290	4
695	439	169	21
696	850	327	200
697	766	295	22
698	954	367	49
699	775	298	256
702	802	309	14
703	288	111	312
775	1775	663	790
776	1352	469	129

Preliminary Recommendations Overview

- **Recently Completed, Previously Planned, and Approved Recommendations**
- **Powhatan County Recommendations**
  - S Creek One and Batterson Rd
  - Jude's Ferry Rd and New Dorset Rd
  - Batterson Rd and Dorset Rd
  - Red Lane
  - Maidens Rd/US 522
  - Two-Lane Section – Roadway Safety Audit
- **Cumberland County**
  - Stoney Point Rd to Cartersville Rd
  - Route 45 and US 60
- **Buckingham County**
  - Rosney Rd to Cumberland County Line
  - Route 15 and US 60
  - Mount Rush Hwy to James River Hwy
- **Amherst County**
  - Route 29 and US 60
  - Lowesville Road to E Monitor Rd

Preliminary Recommendations Overview

Previously Planned and Approved Recommendations

Powhatan County

- Additional turn-lanes at Stavemill Rd with US 60
- Old Buckingham Rd and Academy Road Restrict Crossing U-Turn (RCUT) with US 60
- Carter Gallier Boulevard Extension
- Additional turn-lane at Jude's Ferry Rd with US 60 – UPC 115414

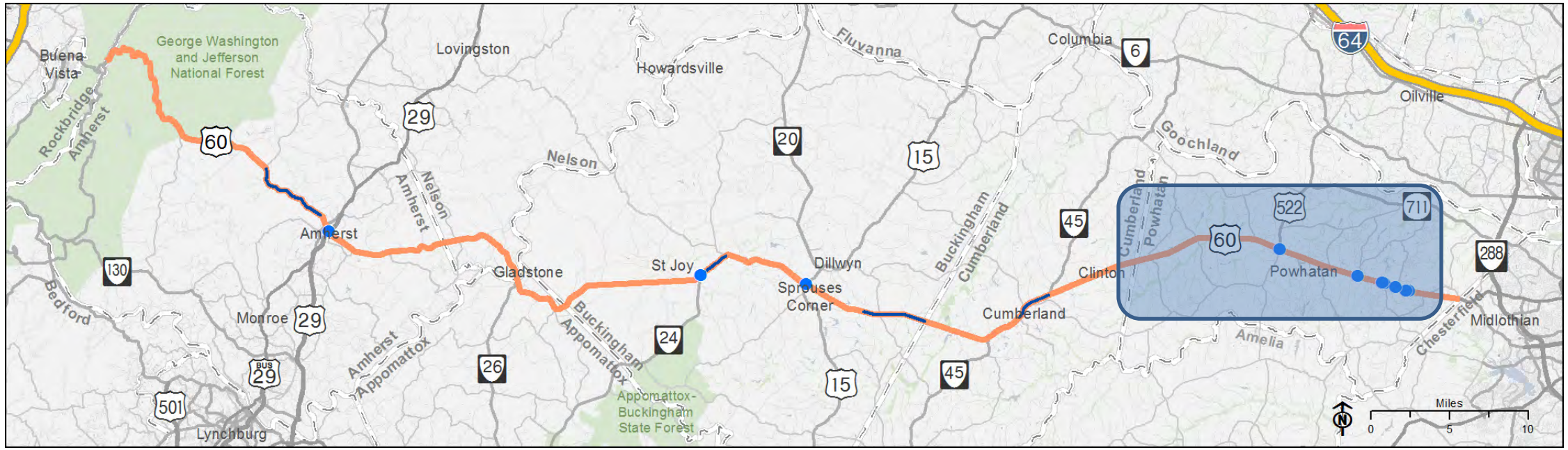
Buckingham County

- Intersection Improvements at Rte. 56 with US 60 – UPC 109704

Town of Amherst

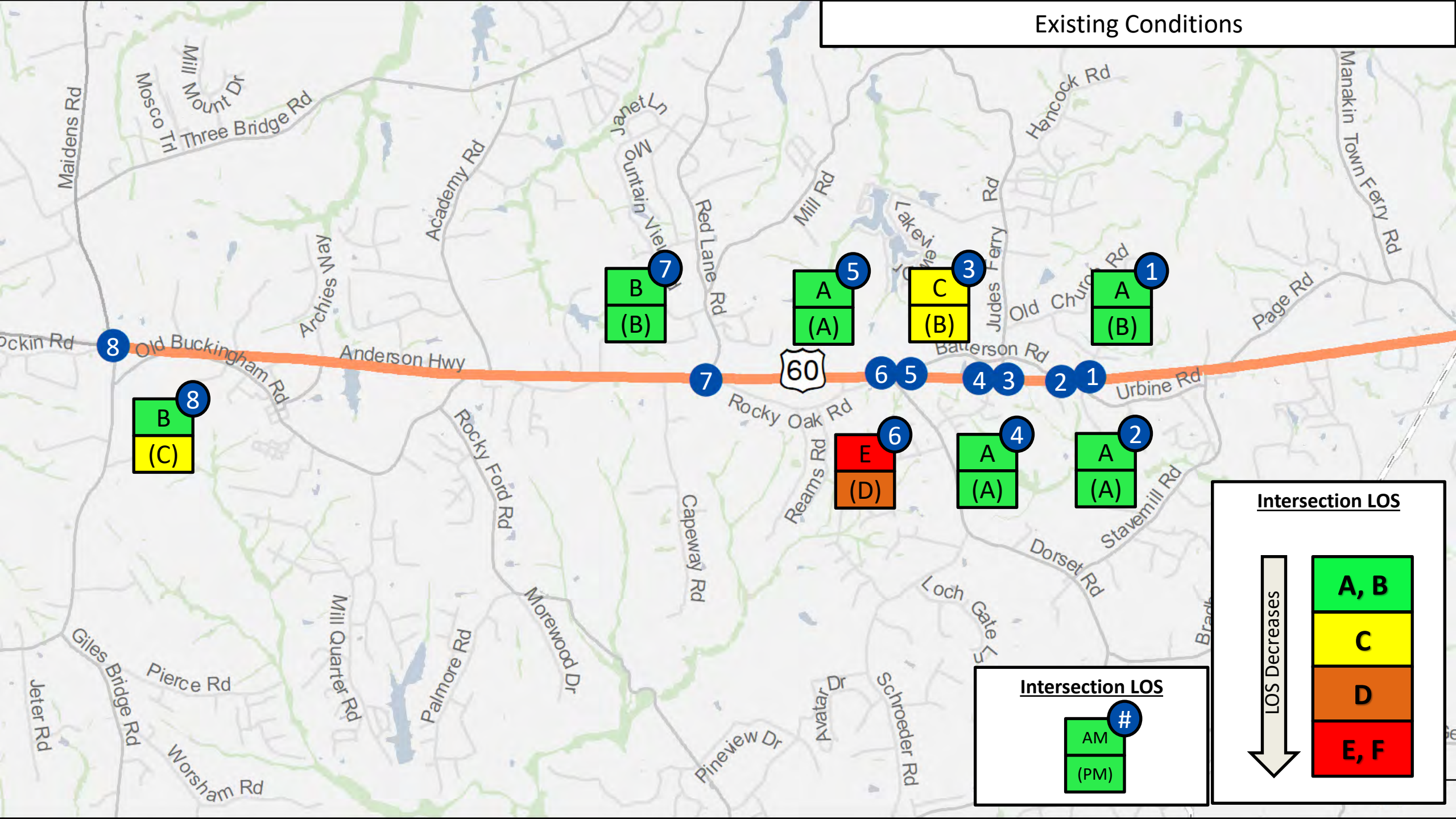
- US 60 and sidewalk improvements from Main St to Washington St

Powhatan County



All Powhatan County recommendations have undergone a review by Emergency Medical Services and School Transportation.

Existing Conditions



Intersection LOS

AM
(PM)
#

Intersection LOS

LOS Decreases

A, B
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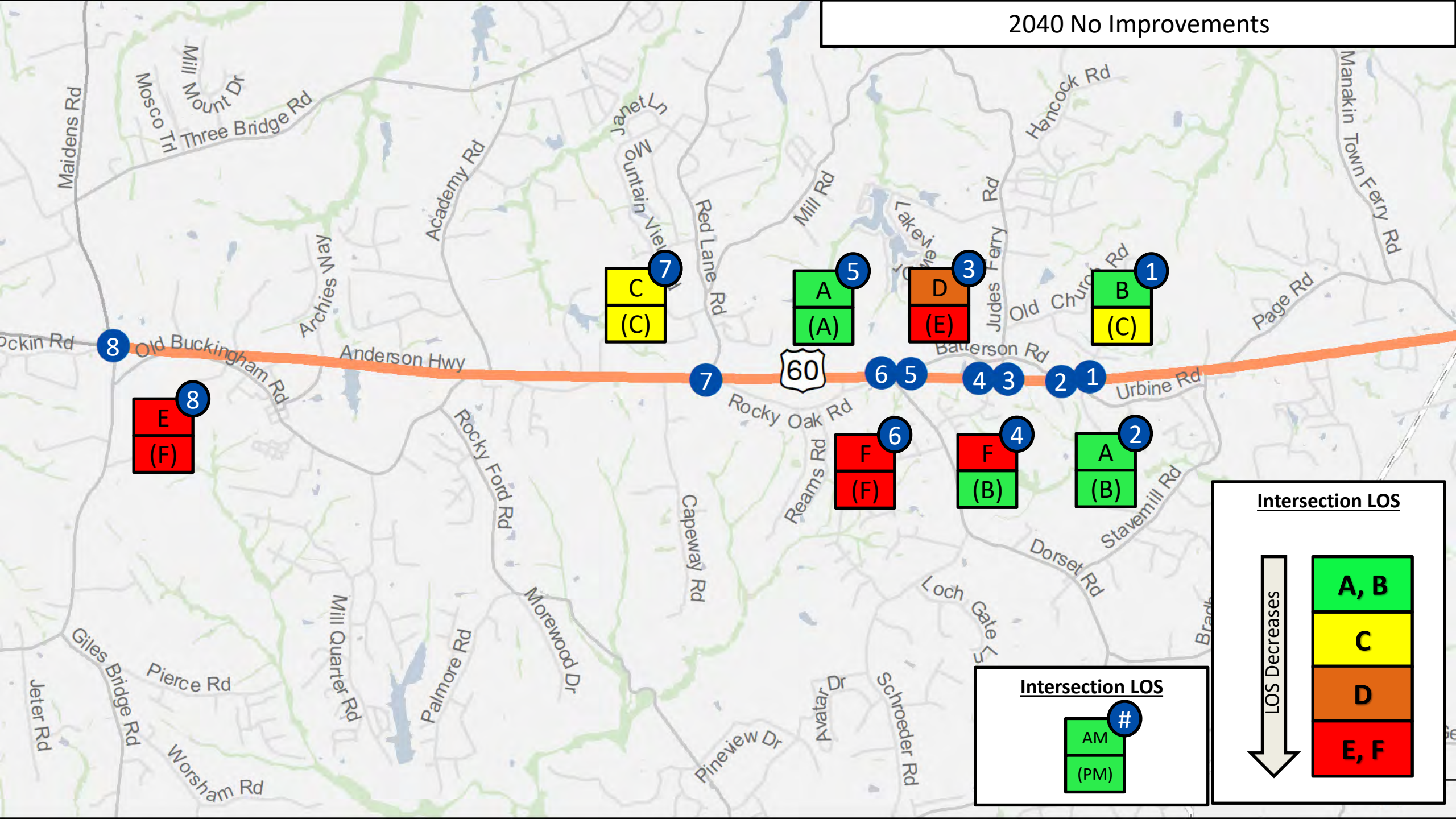
E, F


2040 No Improvements
Maidens Rd
Mosco Trl
Mill Mount Dr
Three Bridge Rd
Academy Rd
Janet Ln
Mountain View
Red Lane Rd
Mill Rd
Hancock Rd
Manakin Town Ferry Rd
Lakeview
Rd
Judes Ferry
Old Church Rd
Page Rd
Archies Way
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Old Buckingham Rd
Anderson Hwy
Batterson Rd
Urbine Rd
Rocky Oak Rd
Rocky Ford Rd
Reams Rd
Capeway Rd
Stavemill Rd
Dorset Rd
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Giles Bridge Rd
Pierce Rd
Jeter Rd
Mill Quarter Rd
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Intersection LOS
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Intersection LOS
LOS Decreases
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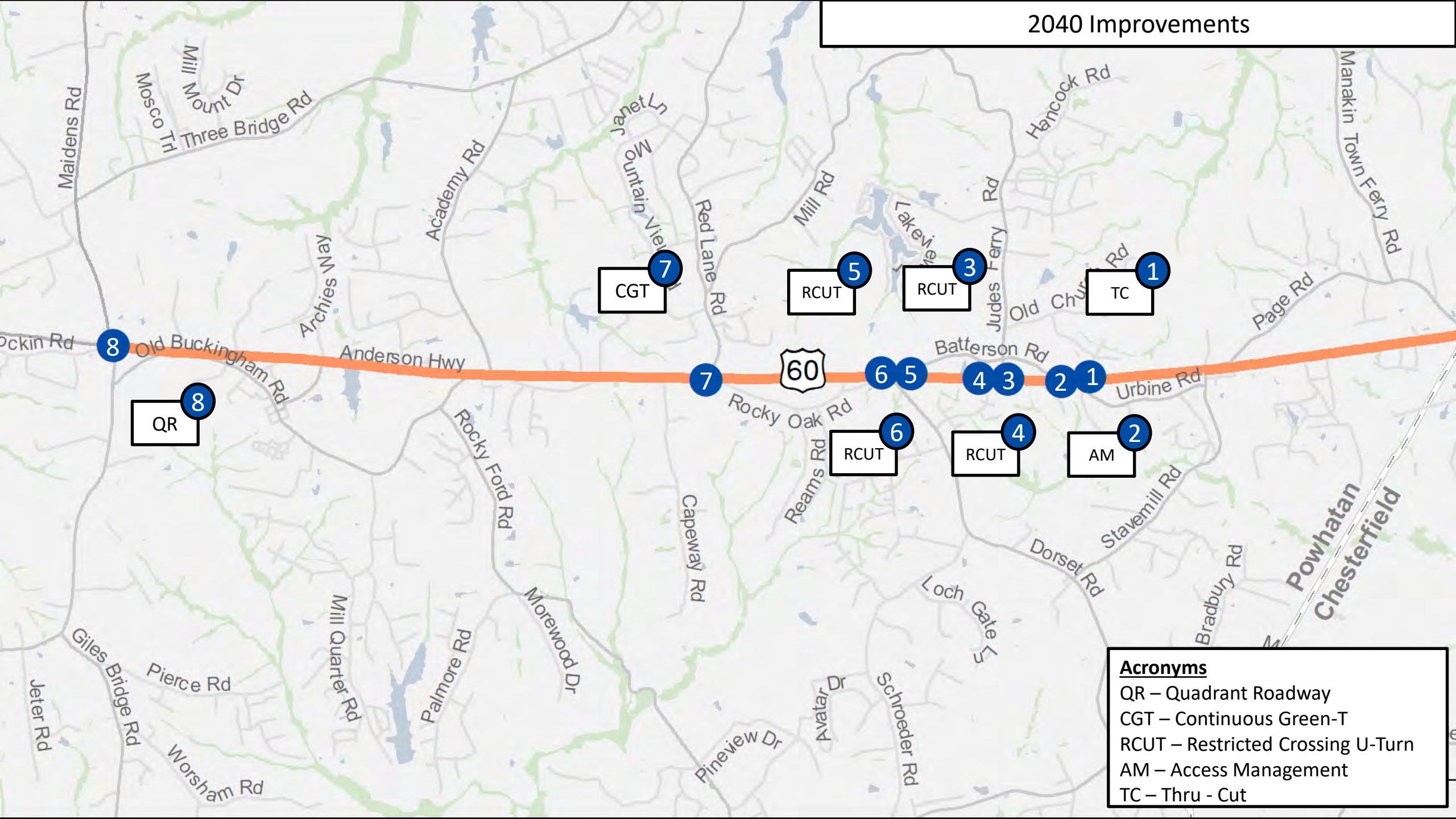
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Urbine Rd
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Rocky Ford Rd
Capeway Rd
Morewood Dr
Palmore Rd
Mill Quarter Rd
Giles Bridge Rd
Pierce Rd
Jeter Rd
Worsham Rd
Pineview Dr
Avatar Dr
Schroeder Rd
Loch Gate Ln
Dorset Rd
Stavemill Rd
Bradbury Rd
Powhatan
Chesterfield
CGT 7
RCUT 5
RCUT 3
TC 1
QR 8
RCUT 6
RCUT 4
AM 2
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Acronyms
QR – Quadrant Roadway
CGT – Continuous Green-T
RCUT – Restricted Crossing U-Turn
AM – Access Management
TC – Thru - Cut

Route 60 Arterial Management Plan
Intersection: US 60 and New Dorset Rd US 60 and Jude's Ferry Rd
Powhatan County

Recommendation: Convert the intersections of US 60 with New Dorset Road and Jude's Ferry Road into Restricted Crossing U-turns (RCUT). The intersection with New Dorset Road will have two westbound left-turn lanes, the innermost lane will be used for U-turn movements. The Jude's Ferry Rd intersection improvement will take advantage of the currently funded eastbound left-turn lane project to increase capacity.

ROW Impacts: The New Dorset Rd continuous right-turn lane onto US 60 will require some ROW

Improvement Type: Safety, Travel Time Preservation

Traffic Operations & Safety:

New Dorset Rd & US 60:

Operating Condition	AM	PM
Existing 2019	9.8s - A	(3.4s - A)
2040 No Improvements	51.5s - F	(11.2s - B)
2040 with Improvements	14.3s - B	(8s - A)

Intersection Delay (s/veh) – Level of Service

Batterson Rd & US 60:

Operating Condition	AM	PM
Existing 2019	0.2s - A	(0.7s - A)
2040 No Improvements	0.6s - A	(1.4s - A)
2040 with Improvements	2.5s - A	(17.6s - B)

Intersection Delay (s/veh) – Level of Service

Anticipated Safety Benefits

- RCUTs provide a 54% reduction in injury and fatal crashes (FHWA)
- Reduces left turn conflicts

Cost: $2.8M to $4.6M
2020 Cost Estimates

Standard Movements

SB Left from Jude's Ferry Rd and Batterson Rd

Route 60 Arterial Management Plan
Intersection: US 60 and Dorset Rd; US 60 and Batterson Rd
Powhatan County

Recommendation: Reconfigure the intersection of US 60 and Dorsett Road to a Restricted Crossing U-turn (RCUT) with two northbound right-turn lanes. Reconfigure the minor approaches at the intersection of US 60 and Batterson Road to only allow rights-in and rights-out and reconfigure the crossover at this intersection to allow eastbound U-turns. Construct a westbound U-turn area approximately 400 feet west of the intersection of US 60 and Dorsett Road.

ROW Impacts: All improvements are within the ROW

Improvement Type: Safety, Operations, Travel Time Preservation

Traffic Operations & Safety:

US 60 & Dorset Rd:

Operating Condition	AM	PM
Existing 2019	142.6s - F	(45.5s - D)
2040 No Improvements	98.8s - F	(126.3s - F)
2040 with Improvements	19s - B	(27.5s - C)

Intersection Delay (s/veh) – Level of Service

US 60 & Batterson Rd:

Operating Condition	AM	PM
Existing 2019	0.2s - A	(0.7s - A)
2040 No Improvements	0.6s - A	(1.4s - A)
2040 with Improvements	2.5s - A	(17.6s - B)

Intersection Delay (s/veh) – Level of Service

Anticipated Safety Benefits

- Reduced conflict points where vehicles cross paths
- RCUTs reduce injury and fatal crashes up to 54% (FHWA)

Cost: Cost: $3.6M to $6.1M
2020 Cost Estimates

Standard Movements
SB Lefts from Dorset Rd and Batterson Rd
NB Left from Dorset Rd

Route 60 Arterial Management Plan
Intersection: US 60 and Red Lane Rd
Powhatan County

Recommendation: Reconfigure intersection of US 60 and Red Lane Rd to Continuous Green-T (CGT).

ROW Impacts: All improvements are within the ROW

Improvement Type: Safety, Travel Time Preservation

Traffic Operations & Safety:

Operating Condition	AM	PM
Existing 2019	16.4s - B	(22.9s - C)
2040 No Improvements	29.6s - C	(25.7s - C)
2040 with Improvements	11.3s - B	(19.7s - B)

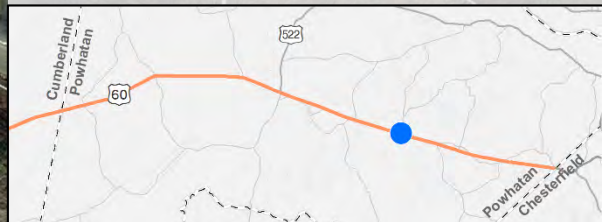
Intersection Delay (s/veh) – Level of Service

Anticipated Safety Benefits

- Reduced conflict points where vehicles cross paths.
- Reduced risk of angle crashes from Red Lane Rd onto US 60 eastbound.

Cost: $1.0M to $2.0M
2020 Cost Estimates

Standard Movements



Route 60 Arterial Management Plan Intersection: US 60 and Maidens Rd/Emmanuel Church Rd Powhatan County

Recommendation: Implement a combination of a Quadrant Roadway (QR), Roundabout, and CGT. Reconfigure the intersection of Maidens Road and US 60 to permit thru and right turn movements only. Construct a roundabout on Maidens Rd and construct a Quadrant Roadway in the northeast corner of the intersection that connects the Roundabout to US 60. Also, construct a Continuous Green-T (CGT) intersection at the tie-in point of the QR with US 60.

ROW Impacts: The Roundabout and Quadrant Roadway will require significant ROW

Improvement Type: Safety, Operations, Travel Time Preservation

Traffic Operations & Safety:

Operating Condition	AM	PM
Existing 2019	43s - D	(48.3s - D)
2040 No Improvements	63.1s - E	(87.1s - F)
2040 with Improvements	30.7s - C	(28.4s - C)

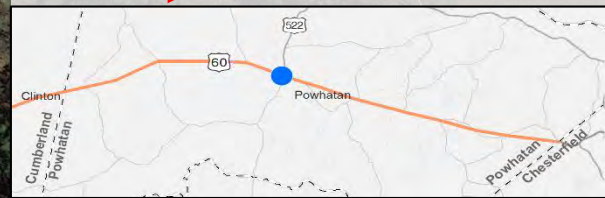
Intersection Delay (s/veh) – Level of Service

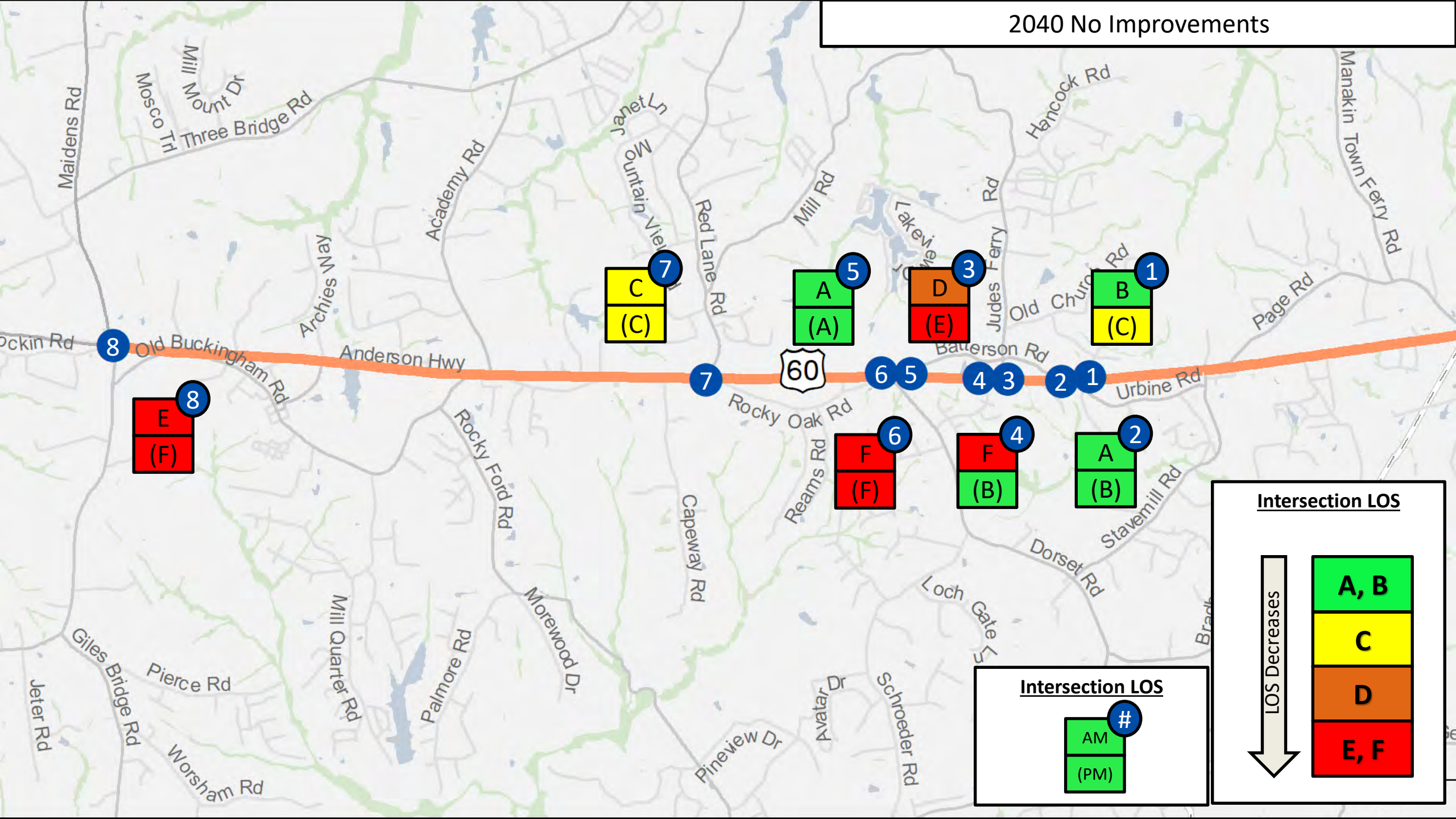
Anticipated Safety Benefits

- The proposed concept can reduce intersection-related injury crashes up to 40% (FHWA)

Cost: $10.3M to $17.1M
2020 Cost Estimates

- Standard Movements
- WB left from US 60
- EB left from US 60
- NB left from Emmanuel Church Rd
- SB left from Maidens Rd

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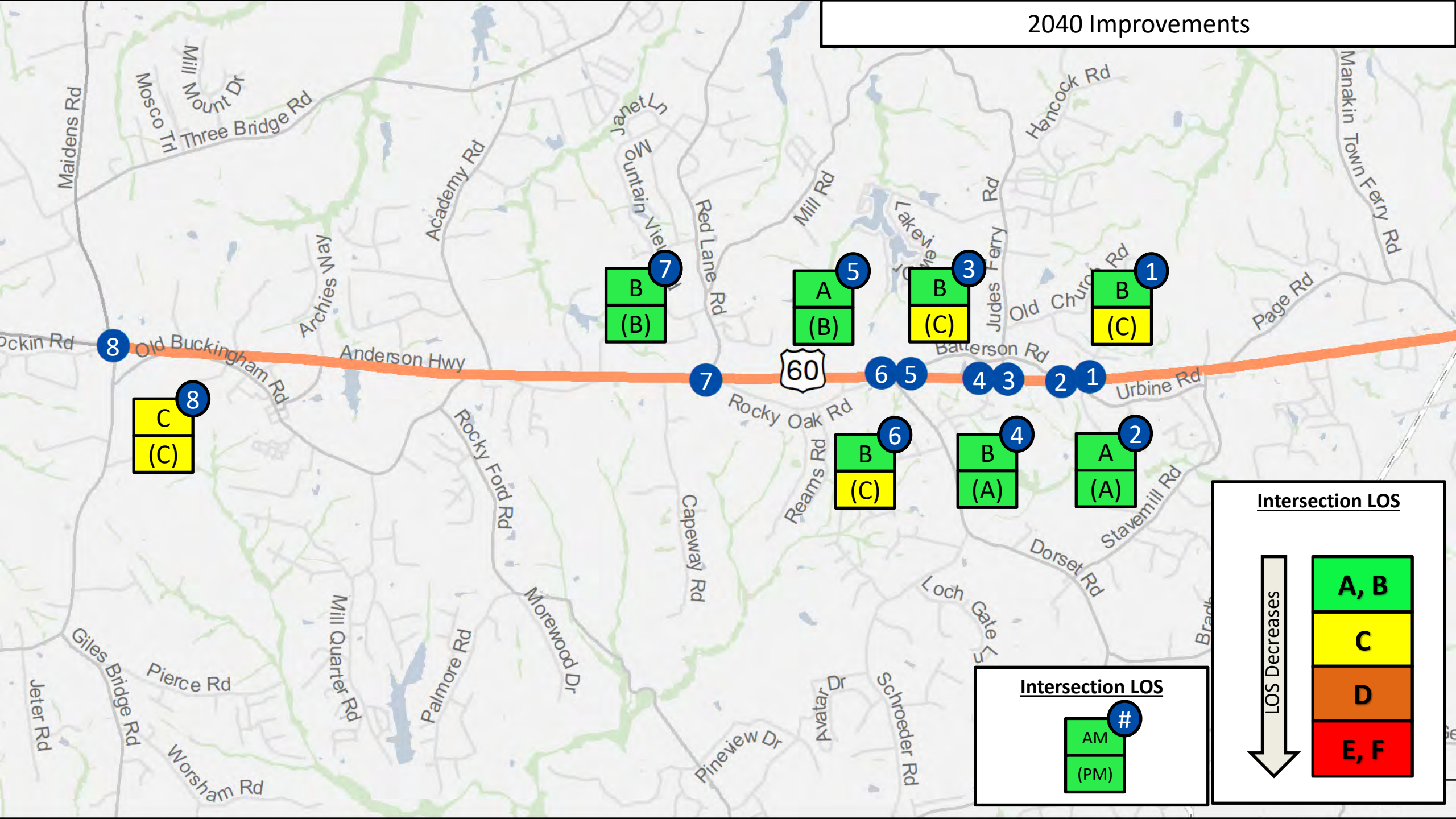
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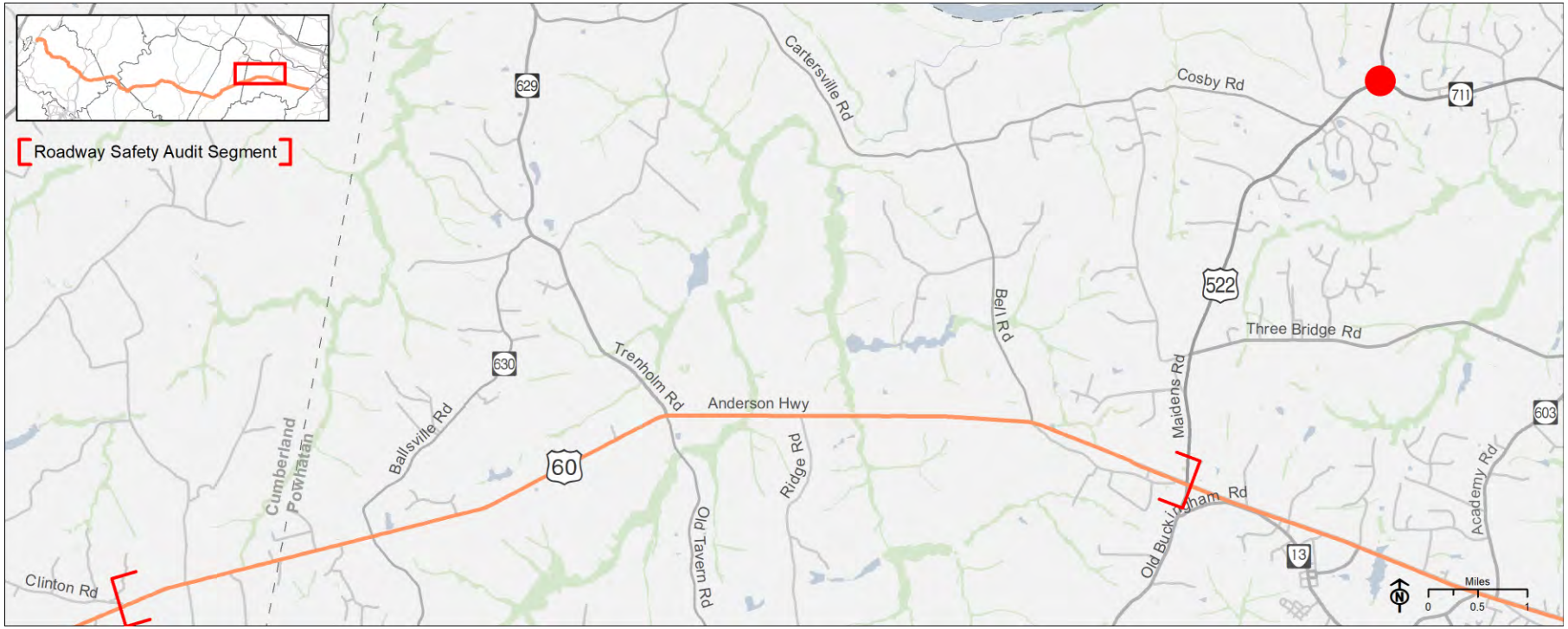
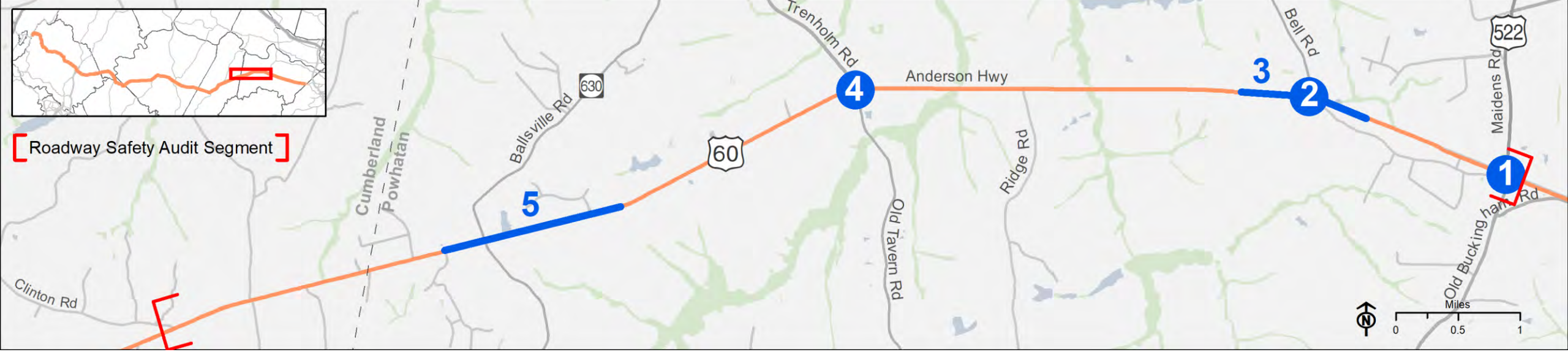
Roadway Safety Audit



- Conducted for the portion of the study corridor between US 522 and Route 601 in response to comments received during the public input process

- Included the intersection of US 522 and Route 711
  - Safety and operational analyses were performed for this intersection
  - No improvements are recommended at this time



Roadway Safety Audit Segment – Conducted in response to citizen comments received through the public input process.

Location-Specific Recommendations:

1. Improve Maidens Rd/US 522 Intersection (As shown previously)
2. Improve intersection warning signage
3. Provide a two-way center turn lane with shoulder rumble strips and safety edge
4. Construct westbound US 60 Right-turn lane and evaluate options to preserve access to the adjacent commercial property while improving visibility for drivers at the intersection
5. Fully-paved, wider shoulders with shoulder rumble strips and safety edge

General Recommendations:

- Safety Edges shape the edge of the shoulder to 30 degrees, allowing drivers who drift off the road to return safely.
- Rumble Strips use noise to alert drivers who are leaving the travel lane and are proven to be effective in reducing roadway departure crashes. New sinusoidal rumble strip designs significantly reduce exterior noise compared to conventional rumble strips.
- Wide shoulders provide an area for users to avoid crashes, move disabled vehicles out of the travel lane, perform maintenance activities, and law enforcement activities.

Cumberland County

ROUTE 60 RECOMMENDATIONS

General Notes

Install new signs where noted with: —•—

Renew pavement markings where noted with: ———

Route 60 Arterial Management Plan
Intersection: US 60 and Northfield Rd/Cartersville Rd
Cumberland County

Recommendation:
Reconfigure the intersection of Cartersville Road and US 60 to remove the dual northbound and southbound approaches and create a more perpendicular intersection alignment. Construct a westbound right-turn lane on Route 60.

ROW Impacts: ROW will be required for the re-alignment of the northbound approach

Improvement Type: Safety

Traffic Operations & Safety:

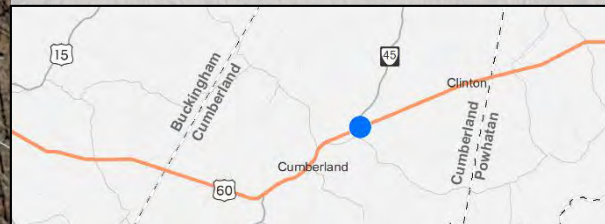
Operations

Maintains existing operations

Anticipated Safety Benefits

- Eliminate potential for prohibited movements
- Improved sight distance

Cost: $1.4M to $2.4M
2020 Cost Estimates

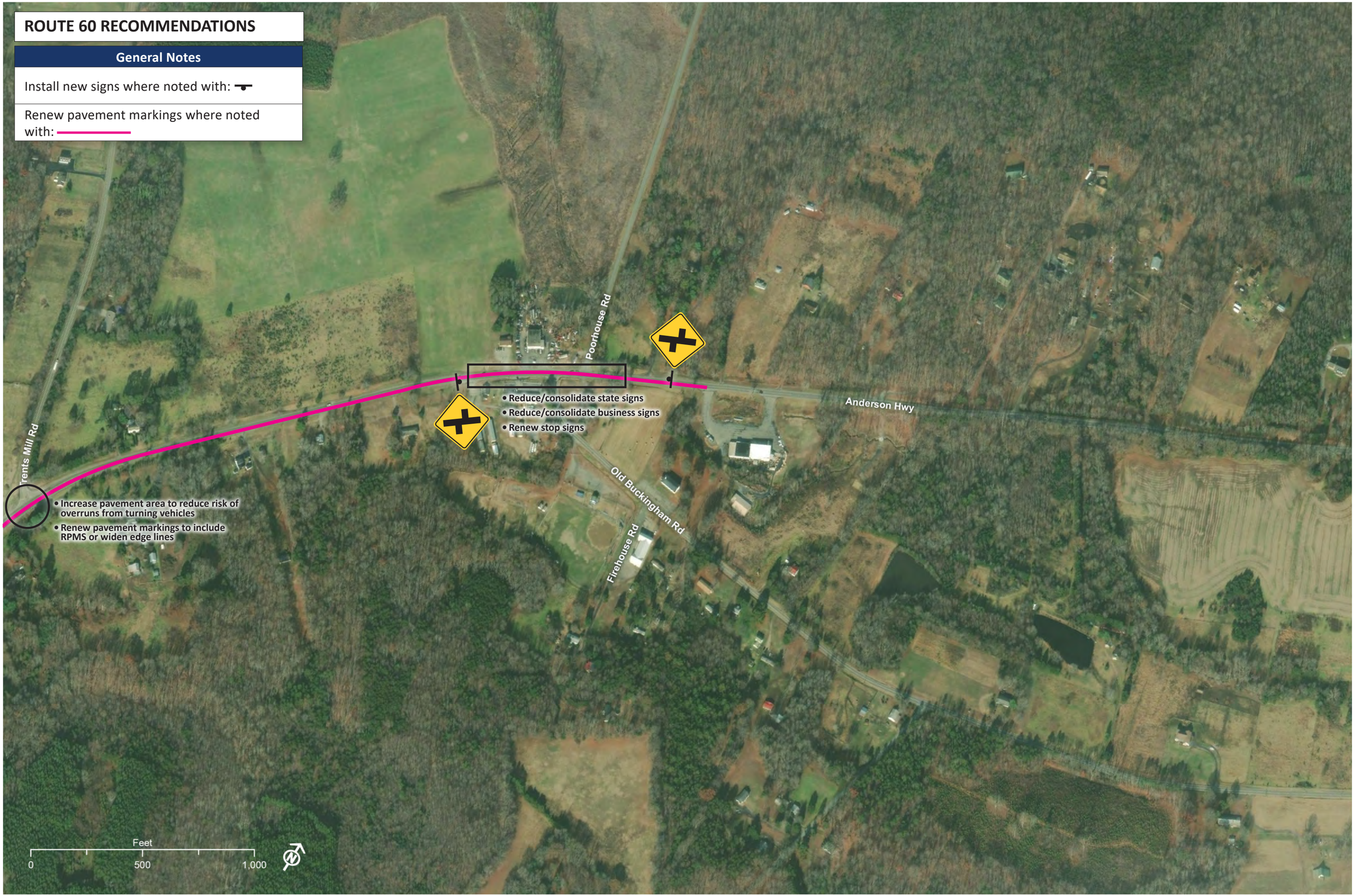


ROUTE 60 RECOMMENDATIONS

General Notes

Install new signs where noted with: —●—

Renew pavement markings where noted with: ———



ROUTE 60 RECOMMENDATIONS

General Notes
Install transverse lane rumble strips or speed lane reduction marking where noted with:
Install new signs where noted with:
Renew pavement markings where noted with:

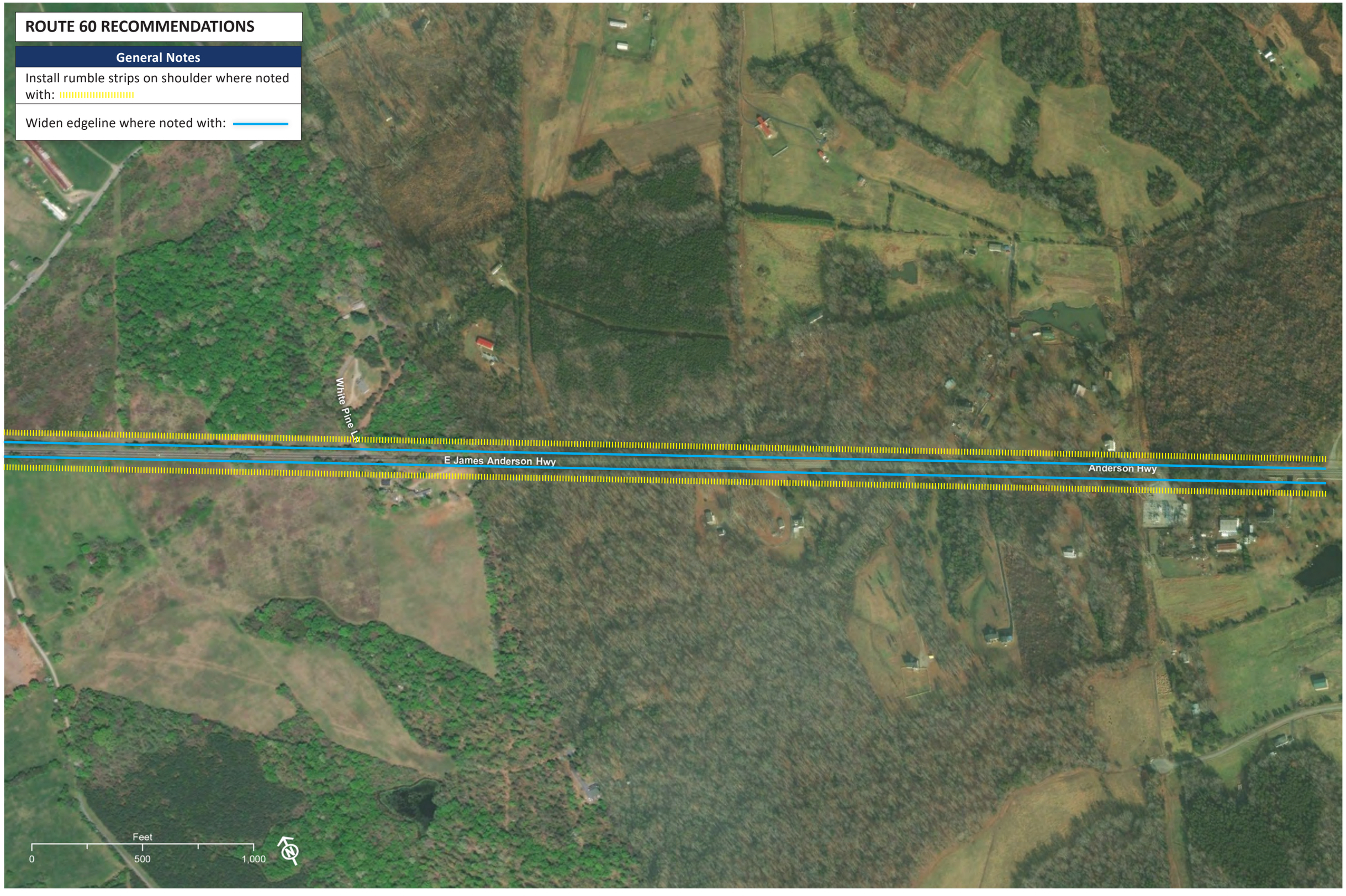
Buckingham County

ROUTE 60 RECOMMENDATIONS

General Notes

Install rumble strips on shoulder where noted with:

Widen edgeline where noted with:



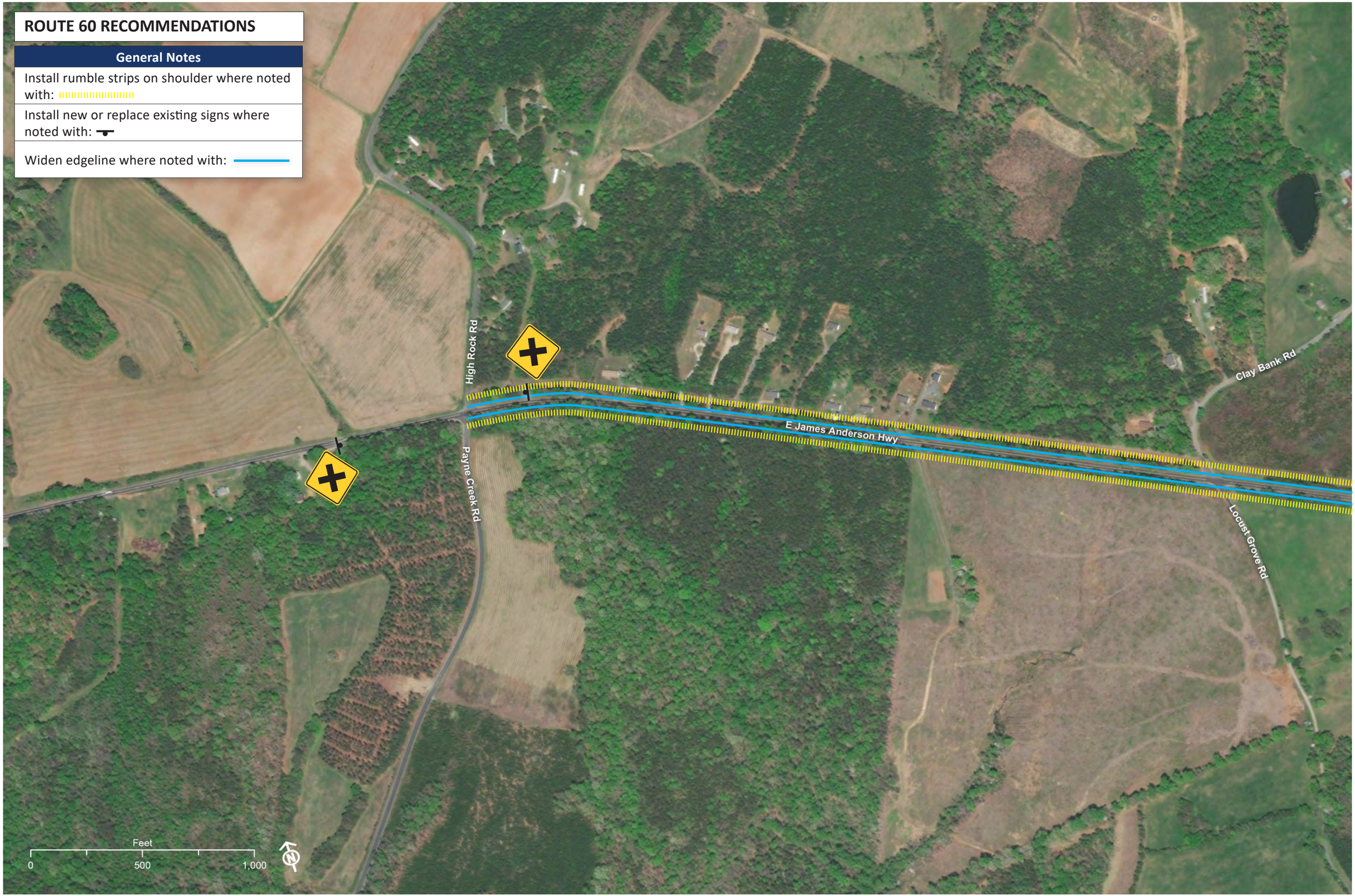
ROUTE 60 RECOMMENDATIONS

General Notes

Install rumble strips on shoulder where noted with:

Install new or replace existing signs where noted with:

Widen edgeline where noted with:



ROUTE 60 RECOMMENDATIONS

General Notes

Widen edgeline where noted with:

ROUTE 60 RECOMMENDATIONS

General Notes

Widen edgeline where noted with: ——

Install guardrail delineators where noted with: • • • • • • • • • • •

Upgrade guardrail end treatment where noted with: ▨

Rosney Rd

E James Anderson Hwy

Feet

0 500 1,000

N

Buckingham County

Route 60 Arterial Management Plan
Intersection: US 60 and S James Madison Hwy
Buckingham County

Recommendation: Reconfigure the intersection as a Roundabout with a free-flow southbound right-turn from S James Madison Highway onto US 60 eastbound

ROW Impacts: All improvements are anticipated to be within the ROW

Improvement Type: Safety

Traffic Operations & Safety

Operating Condition	AM	PM
Existing 2019	28.3s - C	(28.2s - C)
2040 No Improvements	29.7s - C	(32.2s - C)
2040 with Improvements	15.4s - C	(11s - B)

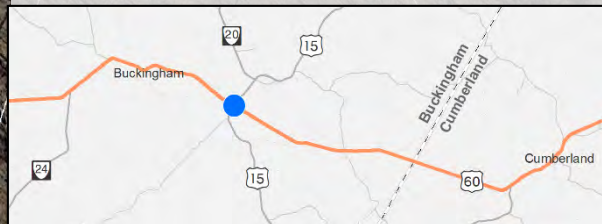
Intersection Delay (s/veh) – Level of Service

Anticipated Safety Benefits

- Reconfiguring a signalized intersection into a single-lane roundabout can reduce all crash types up to 58%
- Reconfiguring a signalized intersection into a single-lane roundabout can reduce injuries and fatalities up to 80%

Cost: $3.8M to $6.3M
2020 Cost Estimates

Standard Movements



Buckingham County

ROUTE 60 RECOMMENDATIONS

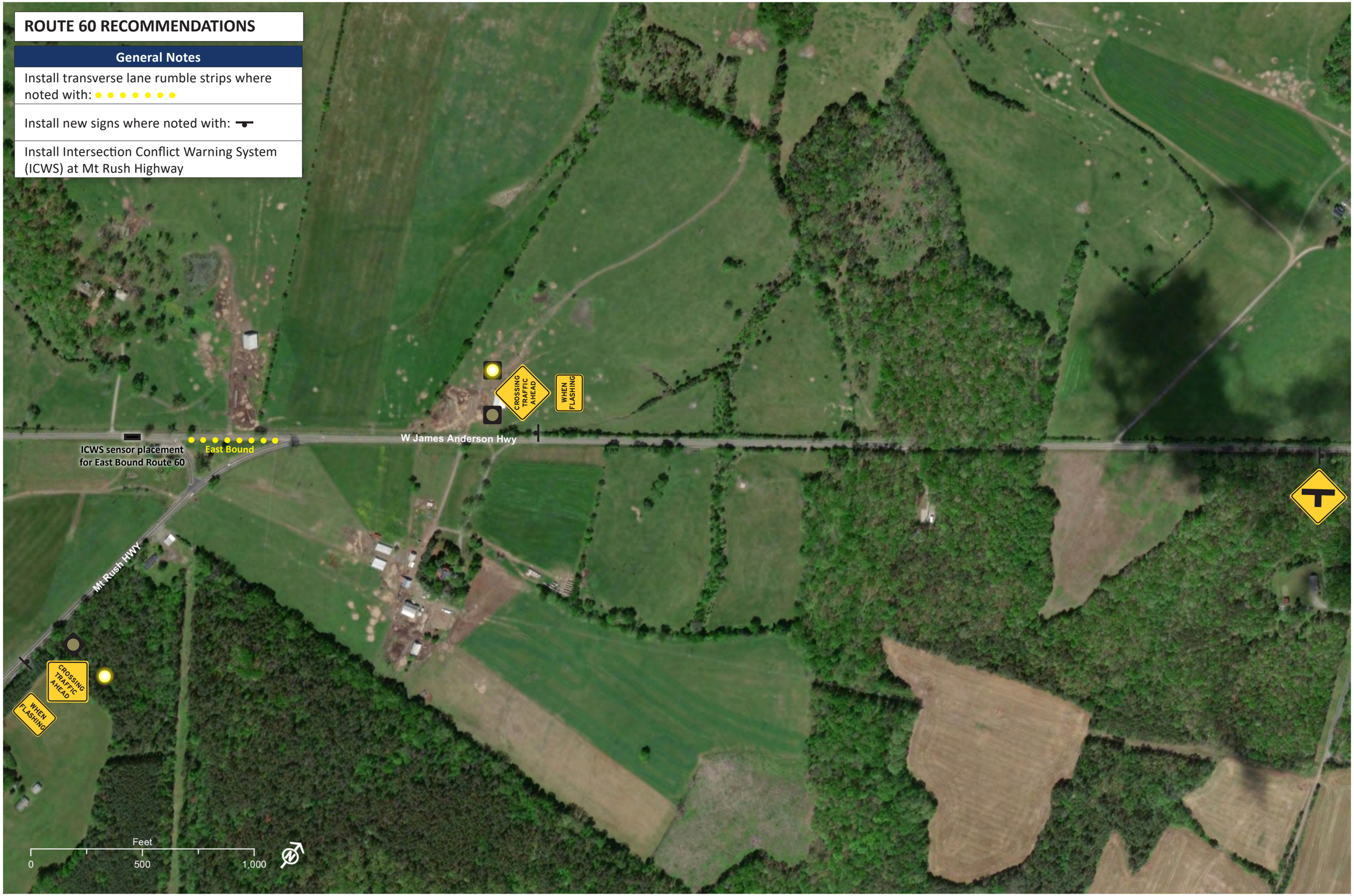
General Notes

Install roadside delineation or widen edgeline where noted with:

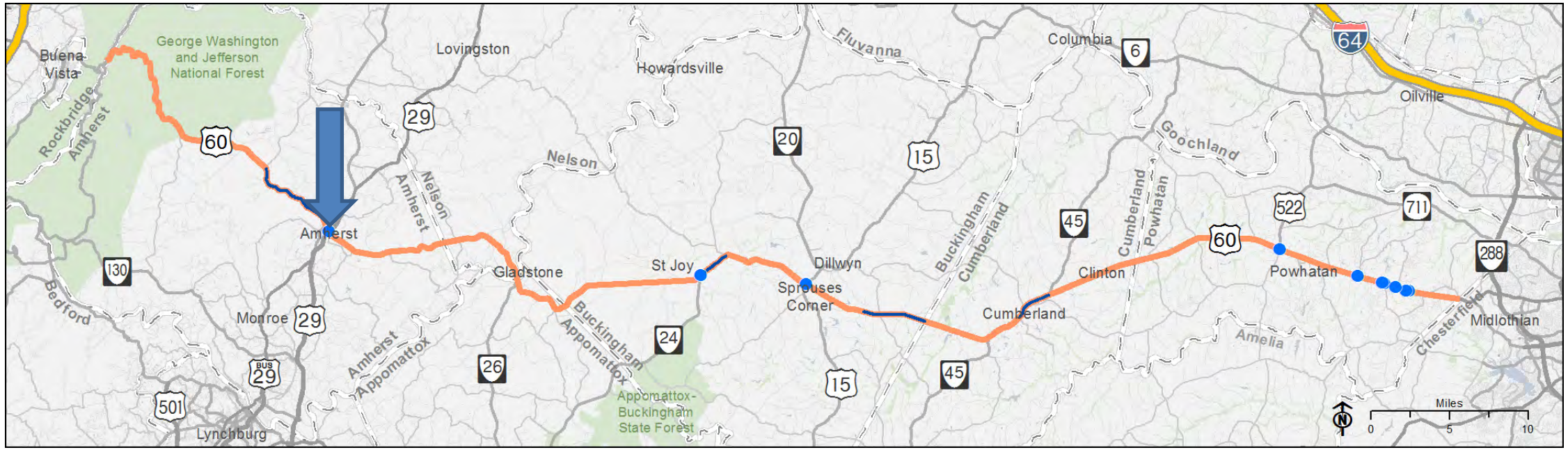
Install new or replace existing signs where noted with:

ROUTE 60 RECOMMENDATIONS

General Notes
Install transverse lane rumble strips where noted with: ● ● ● ● ● ● ●
Install new signs where noted with: ⊢●
Install Intersection Conflict Warning System (ICWS) at Mt Rush Highway



Amherst County



Route 60 Arterial Management Plan
Intersection: US 60 and 29 Interchange
East/West
Amherst County

Recommendation: Reconstruct the median of the US 60 bridge over US 29 and re-stripe to include one through-lane in each direction along with left-turn bays for the ramps to US 29. Also re-stripe the approaches to the bridge to include turn lanes and one through-lane in each direction.

ROW Impacts: All improvements are within the ROW

Improvement Type: Safety

Traffic Operations & Safety:

US 60 & 29 Interchange(West):

Operating Condition	AM	PM
Existing 2019	3.9s - A	(2.1s - A)
2040 No Improvements	4.3s - A	(2.2s - A)
2040 with Improvements	4.4s - A	(2.3s - A)

Intersection Delay (s/veh) – Level of Service

US 60 & 29 Interchange(East):

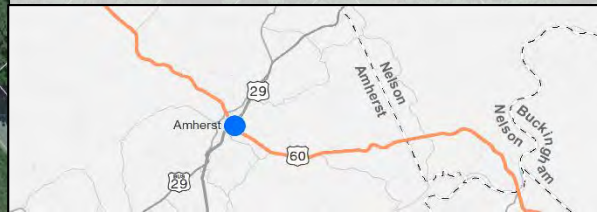
Operating Condition	AM	PM
Existing 2019	2.5s - A	(5.4s - A)
2040 No Improvements	2.6s - A	(5.7s - A)
2040 with Improvements	2.6s -A	(5.7s - A)

Intersection Delay (s/veh) – Level of Service

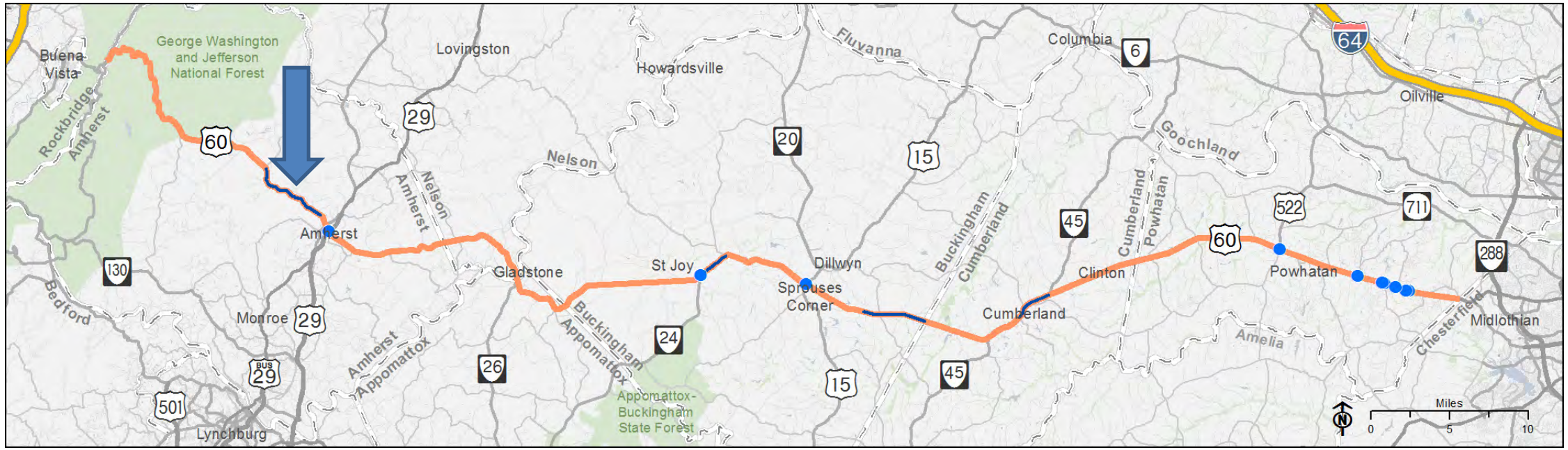
Anticipated Safety Benefits

- Providing dedicated left-turn lanes at stop-controlled intersections decreases the total crashes by 28-48% (FHWA)
- Providing dedicated right-turn lanes at stop-controlled intersections decreases the total crashes by 14-26% (FHWA)

Cost: $0.45M to $0.75M
2020 Cost Estimates

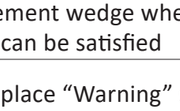


Amherst County



ROUTE 60 RECOMMENDATIONS

General Notes
Install rumble strips on shoulder where noted with:
Install new or replace existing signs where noted with:
Install pavement wedge when pavement conditions can be satisfied
Clean or replace “Warning” signs



ROUTE 60 RECOMMENDATIONS

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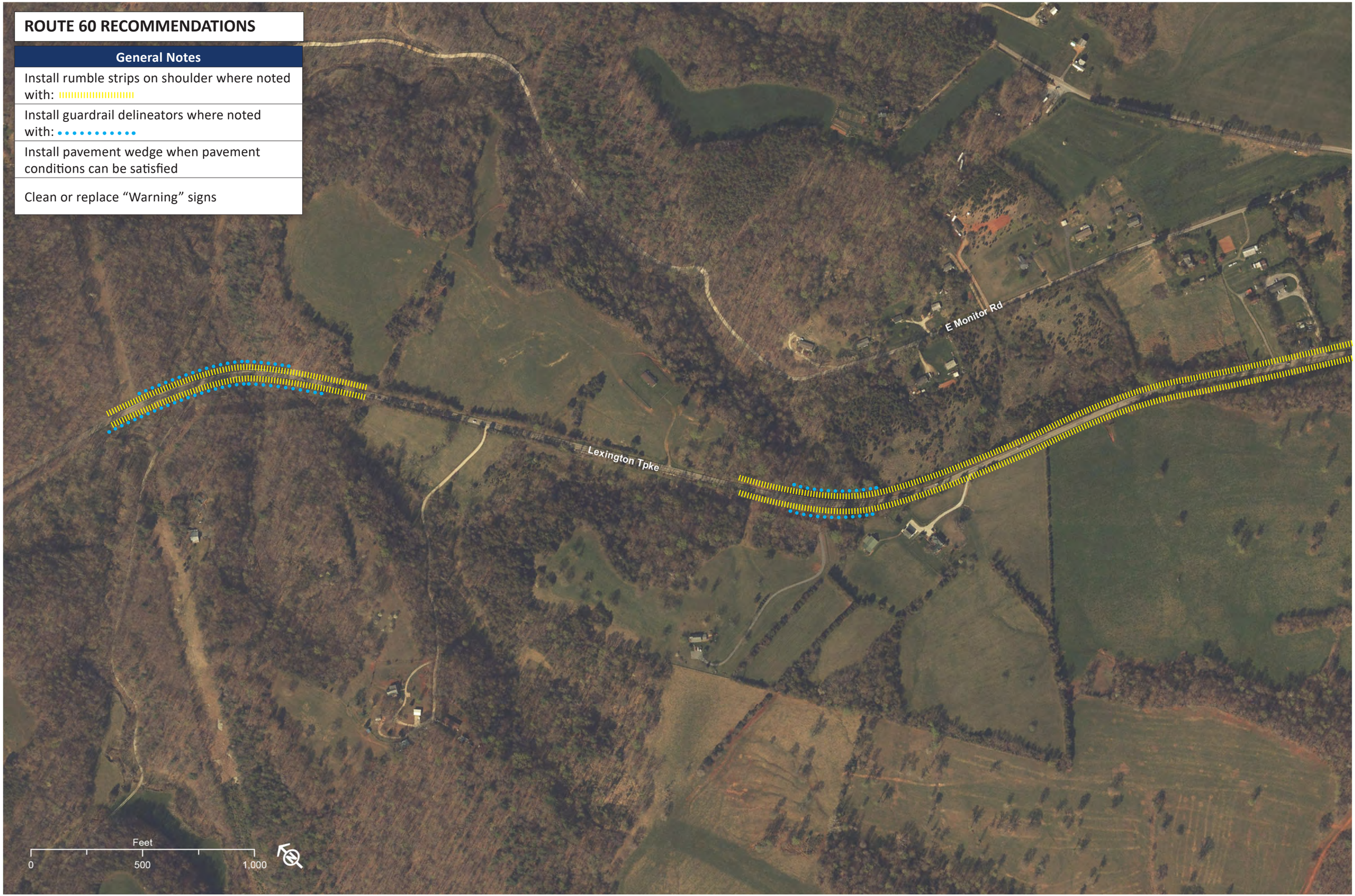

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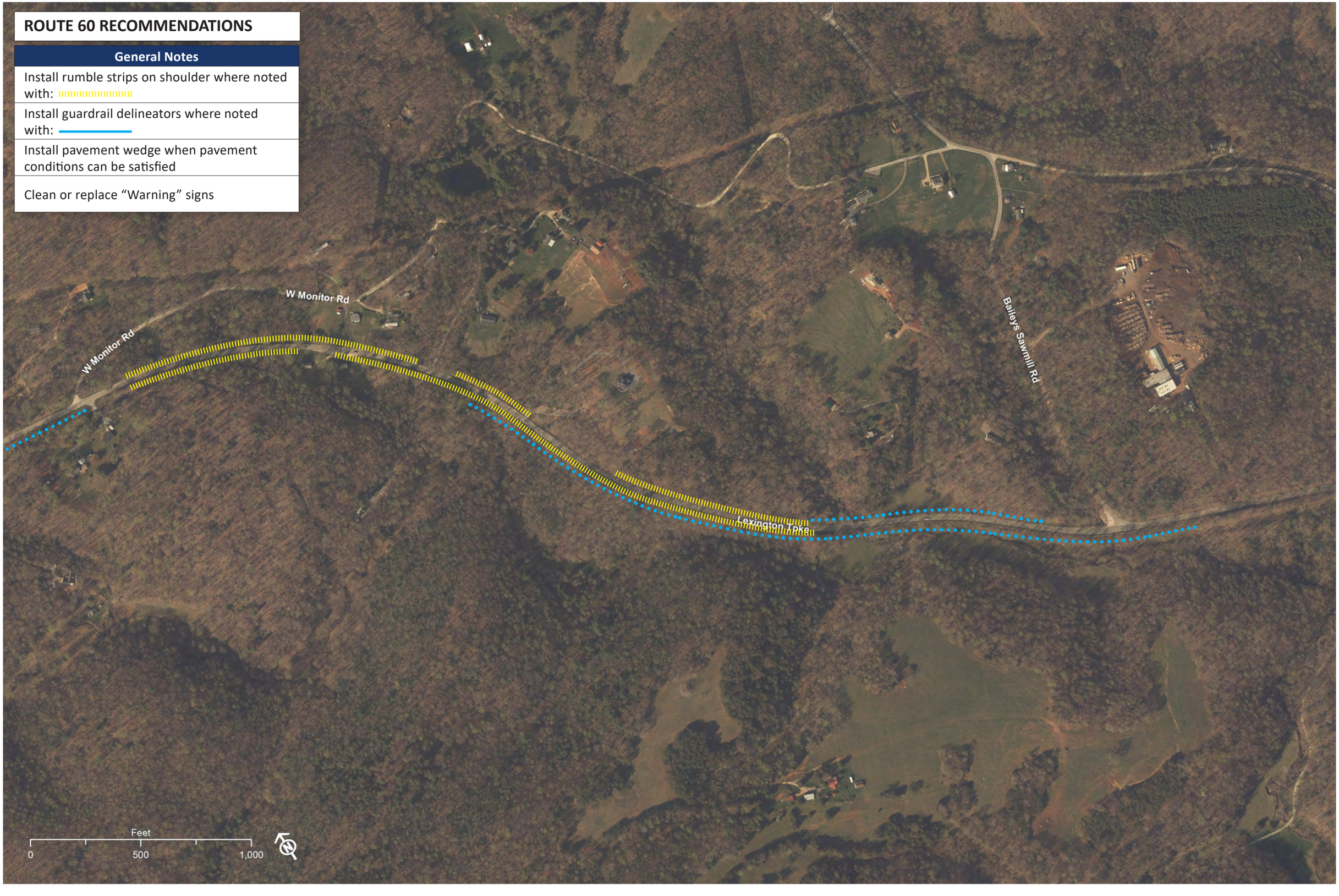

ROUTE 60 RECOMMENDATIONS

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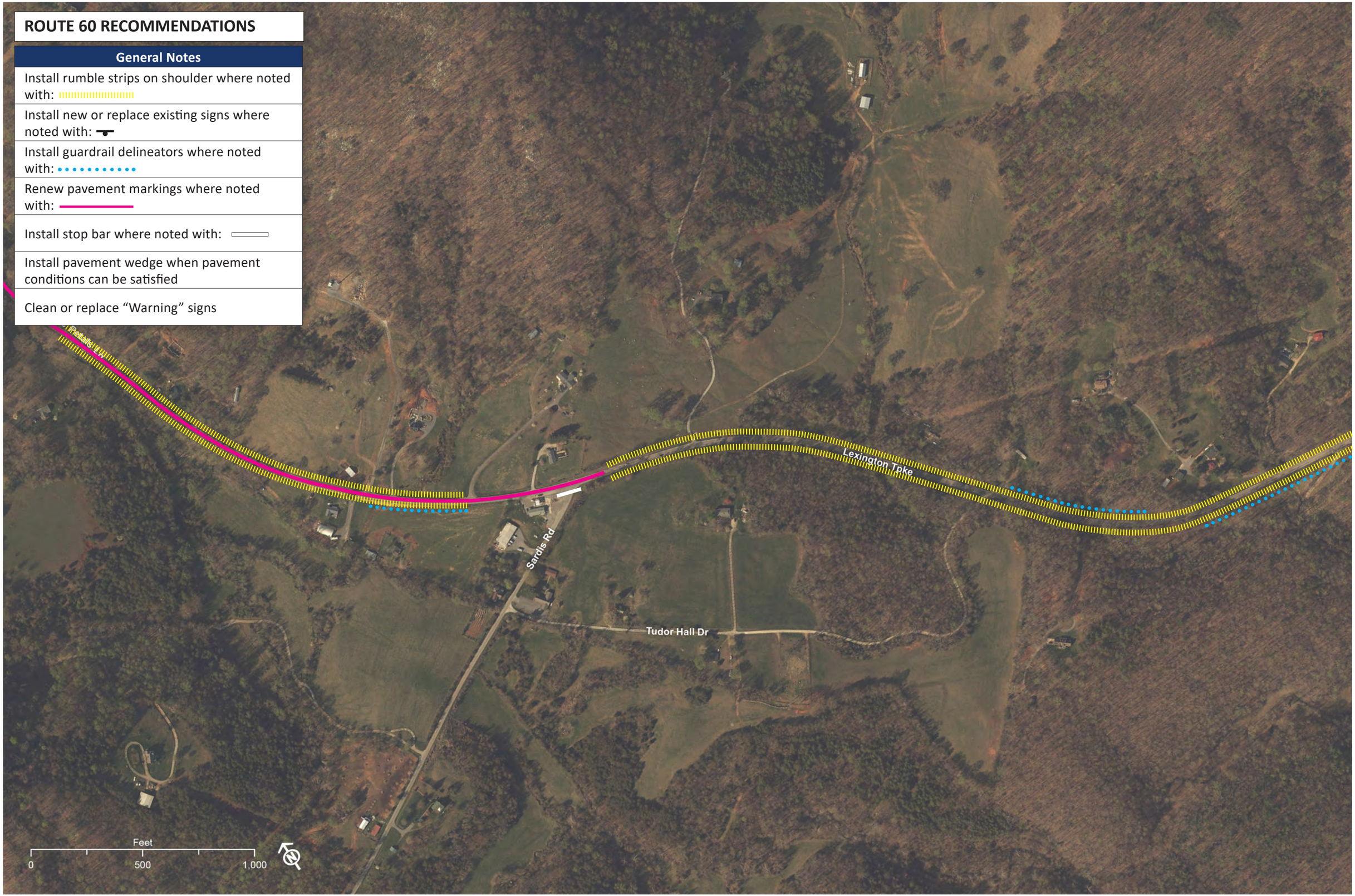
Install guardrail delineators where noted with:
Renew pavement markings where noted with:
Install stop bar where noted with:
Install pavement wedge when pavement conditions can be satisfied
Clean or replace “Warning” signs



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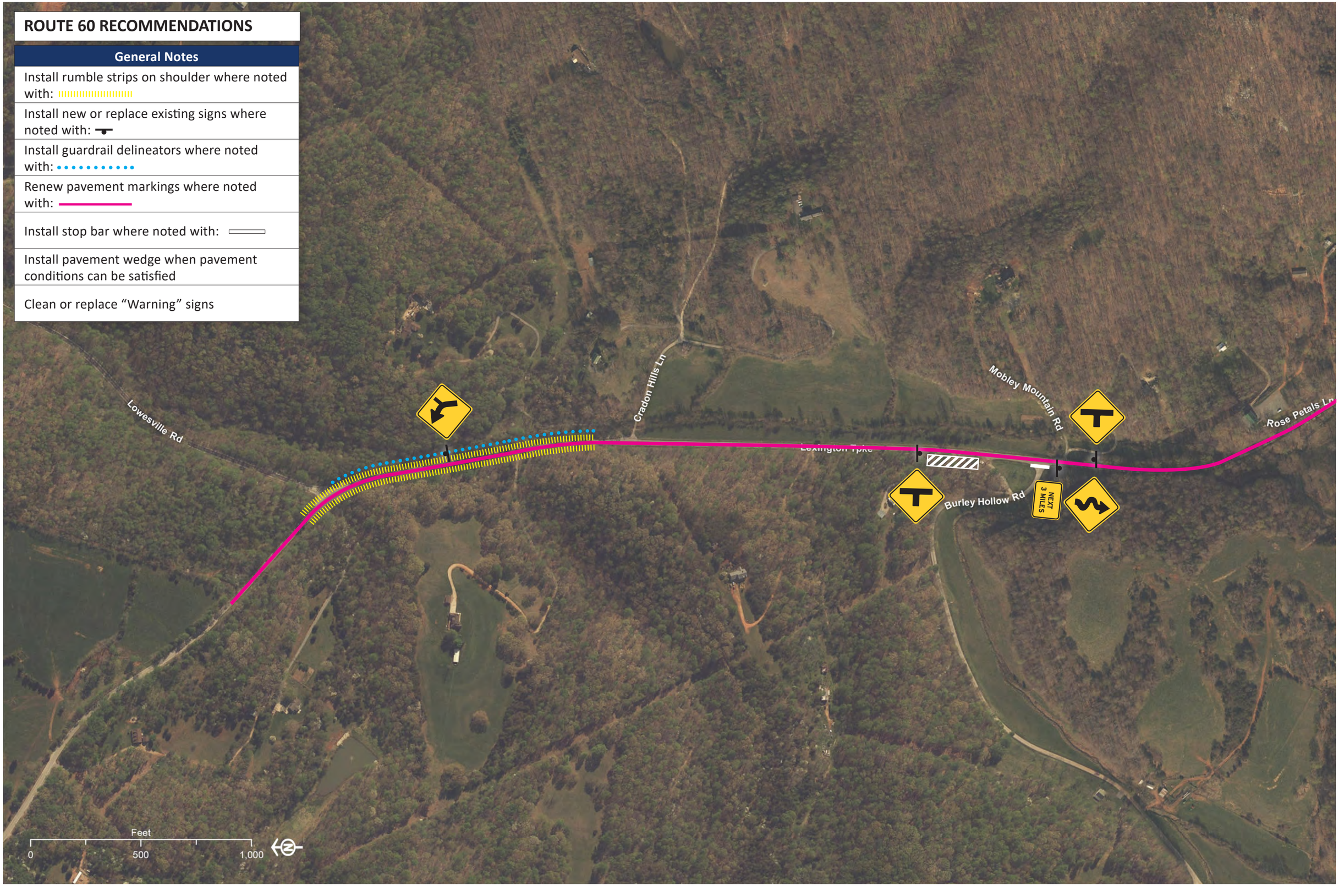

Public Input Process

- Public comment period is from March 26, 2020 to April 11, 2020
- Review additional US 60 Corridor Study materials available at:
  - Lynchburg District Study Website
    - http://www.virginiadot.org/projects/lynchburg/route-60-corridor.asp
  - Richmond District Study Website
    - http://www.virginiadot.org/projects/richmond/route-60-corridor.asp
- Provide Comments by April 11 to:

  Darrel Johnson
  VDOT Project Manager
  1401 E. Broad St.
  Richmond, VA 23219
  (804) 371-8868, (800) 367-7623, or TDD/TYY 711
  Darrel.Johnson@VDOT.Virginia.gov
- Please reference “Route 60 Corridor Study” in the subject line of any e-mail correspondence

US 60 Corridor Study

March 26, 2019

Thank you!