

Traffic Signal Equipment Inventory and Needs Assessment

FINAL REPORT

Town of Vienna On-Call Task Order Contract

Task #1 – Route 123 and Route 243 Traffic Signal Upgrades (Phase 1)

Purchase Order Number: 20180413-00

December 21, 2018



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Table of Contents

CONTENTS

Introduction	1
Project Description	1
Task 1: Signal Equipment Inventory	3
Task 2: Signal Equipment Needs Assessment and Recommendations	3
Task 3: Cost Estimate / Implementation Plan	4

List of Figures

Figure 1: - Project Location Map	2
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List of Tables

Table 1: Cost Estimate Summary By Intersection	5
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List of Appendices

Appendix A: Traffic Signal Equipment Inventory and Needs Assessment Forms	
Appendix B: Detailed Cost Estimate Calculations	

INTRODUCTION

Project Description

The purpose of this project is to perform an assessment of the Town of Vienna's existing signal system along the Route 123 (Maple Avenue) and Route 243 (Nutley Street) corridors ([Figure 1](#)) and make recommendations regarding a phased approach to implementing traffic signal equipment upgrades. The project included a detailed inventory of the existing signal system at the following intersections:

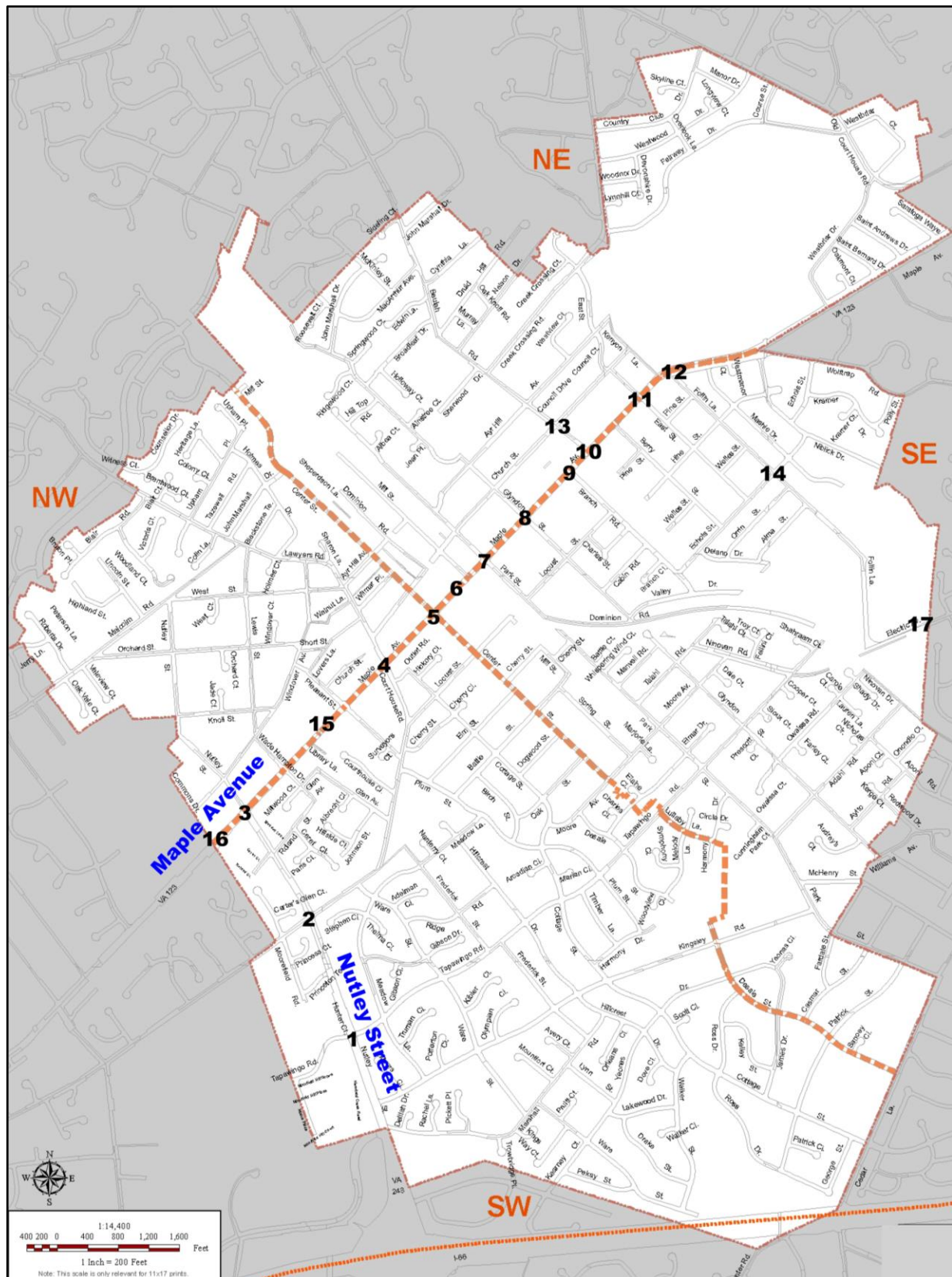
1. Route 243 (Nutley Street) and Tapawingo Road
2. Route 243 (Nutley Street) and Courthouse Road
3. Route 123 (Maple Avenue) and Route 243 (Nutley Street)
4. Route 123 (Maple Avenue) and Courthouse Road/Lawyers Road
5. Route 123 (Maple Avenue) and Center Street
6. Route 123 (Maple Avenue) and Washington & Old Dominion Trail
7. Route 123 (Maple Avenue) and Park Street
8. Route 123 (Maple Avenue) and Glyndon Street
9. Route 123 (Maple Avenue) and Branch Road/Office Driveway
10. Route 123 (Maple Avenue) and Beulah Road/Shopping Plaza Driveway
11. Route 123 (Maple Avenue) and East Street
12. Route 123 (Maple Avenue) and Follin Lane
13. Beulah Road and Church Street
14. Follin Lane and Echols Street
15. Route 123 (Maple Avenue) and Vienna Plaza HAWK Signal
16. Route 123 (Maple Avenue) and James Madison Drive HAWK Signal (Under Construction)
17. Electric Avenue and Navy Federal Credit Union Entrance

This initial purchase order is the first step toward achieving the Town's overall plans to interconnect and upgrade all traffic signal controllers and cabinets along Route 123 and Route 243 within the Town of Vienna and to allow the Town to manage their signals from a singular point using the McCain Transparity TMS Software and Server. This project was undertaken with the knowledge that the Town of Vienna was awarded funds in response to their FY 2018 SmartScale application and that the project must comply with the scope and schedule outlined in the SmartScale application including all federal and state requirements.

Specific tasks within this purchase order included:

- Task 1: Signal Equipment Inventory
- Task 2: Signal Equipment Needs Assessment and Recommendations
- Task 3: Cost Estimate / Implementation Plan

Figure 1: - Project Location Map



TASK 1: SIGNAL EQUIPMENT INVENTORY

Task 1 involved completing a comprehensive traffic signal equipment inventory of all 17 traffic signals within the Town of Vienna ([Appendix A](#)). The inventories were performed using a project-specific form tailored to this project's needs and the condition and type of all devices present were documented including a photograph log.

If a signal permit plan was available, the information presented on the permit plan was compared to the actual equipment and operations in the field and any inconsistencies were noted. Specific items that were inventoried include, but are not limited to the following:

- MUTCD compliance (signal heads and signs)
- Signal poles
- Vehicular signal heads
- Pedestrian signal heads
- Pedestrian push buttons
- Controller type and other cabinet equipment (conflict monitor, load switches, UPS, etc.)
- Detection equipment
- Power source
- Communications

A visual assessment of ADA compliance was also performed for the existing facilities. This included documenting the presence of a detectable warning surface and level landing at each ramp location; however, ramp slopes were not measured as part of this task.

TASK 2: SIGNAL EQUIPMENT NEEDS ASSESSMENT AND RECOMMENDATIONS

Following completion of the traffic signal inventories, the information was analyzed to assess equipment needs and recommend equipment upgrades to achieve the Town of Vienna's ultimate goal of controlling their signal system from a centralized location and potentially operating it as an adaptive system.

To accomplish this goal, the Town intends to utilize the Transparity Traffic Management System (TMS) software manufactured by McCain and potentially utilize the McCain Adaptive signal control strategies built into the Transparity TMS software. The McCain TMS software is a centralized signal software that enables the Town to actively manage its traffic signal system and operations, collect real-time traffic data, and implement timing changes remotely. The software has built-in alarms to notify the Town of hardware issues (i.e. signals in flash, stuck push buttons, etc.) and built-in performance metrics to further optimize traffic operations.

The signal equipment recommendations were separated into three categories:

- Primary recommendations
- Secondary recommendations
- Maintenance recommendations

Primary recommendations are the upgrades required to modernize all signals to a consistent platform and to obtain communications between signals and from a centralized location. These

upgrades include but are not limited to new ATC controller cabinets, Ethernet switches, aerial/underground fiber optic cable, installing APS push buttons, upgrading all pedestrian signals to countdown pedestrian signals (SP-8), upgrading all detection to Autoscope Vision video detection cameras, and installing the McCain Transparity TMS software at the Town Hall.

Secondary recommendations are additional upgrades the Town should consider, if sufficient budget is available, that will further modernize the signals and bring all signals up to current design standards. These upgrades include but are not limited to installing an electronic security lock on each controller cabinet, upgrading each signal electrical service to a metered service, and installing emergency vehicle preemption.

Maintenance recommendations are upgrades the Town should consider as part of routine signal maintenance. These upgrades include but are not limited to replacing faded pavement markings, replacing malfunctioning pedestrian push buttons, installing yellow retroreflective tape on all vehicular signal backplates or installing new high visibility backplates on all signals, and upgrading existing protected/permitted five-section signal heads with four-section flashing yellow arrow (FYA) signal heads.

In addition to the recommendations described above, there are four full signal replacements recommended if sufficient budget is available.

- Route 243 (Nutley Street) and Tapawingo Road
- Route 123 (Maple Avenue) and Follin Lane
- Beulah Road and Church Street
- Follin Lane and Echols Street

These full signal replacements could supplement or replace other secondary recommendations as noted in the cost estimate summary depending on the Town of Vienna's priorities.

TASK 3: COST ESTIMATE / IMPLEMENTATION PLAN

The final task of this purchase order was to prepare a preliminary cost estimate for the identified improvements and develop a phased implementation plan. Cost estimates were developed for the first two tiers of improvements: primary recommendations and secondary recommendations. A cost estimate was not prepared for maintenance recommendations since these improvements will be completed by the Town's maintenance staff.

The cost estimates were prepared based upon sight-specific factors from the field views and the signal equipment needs previously identified and include costs to design, construct, inspect, and administer the project. A meeting was held on November 7, 2018 with the Town of Vienna to determine the equipment recommendations at each intersection and confirm the Town's priorities.

The total estimated costs for each tiers of improvements (primary recommendations and secondary recommendations) are as follows:

- Primary recommendations = \$1,779,219
- Secondary recommendations = \$1,082,616

A summary of costs by intersection is provided in [Table 1](#) and the detailed cost estimate calculations are provided in [Appendix B](#).

Table 1: Cost Estimate Summary By Intersection

Intersection	Cost	
	Primary Recommendations	Secondary Recommendations
1 - Nutley St @ Tapawingo Rd	\$350,000 ⁽¹⁾	\$19,622
2 - Nutley St @ Courthouse Rd	\$130,947	\$19,622
3 - Maple Ave @ Nutley St	\$92,090	\$24,995
4 - Maple Ave @ Courthouse Rd	\$68,470	\$19,622
5 - Maple Ave @ Center St	\$70,482 ⁽⁴⁾	\$19,622
6 - Maple Ave @ W&OD Trail	\$73,986	\$32,703
7 - Maple Ave @ Park St	\$21,239	\$19,622
8 - Maple Ave @ Glyndon St	\$104,481	\$24,294
9 - Maple Ave @ Branch Rd	\$78,879	\$16,819
10 - Maple Ave @ Beulah Rd	\$140,826	\$16,819
11 - Maple Ave @ East St	\$128,020	\$16,819
12 - Maple Ave @ Follin Ln	\$350,000 ⁽¹⁾	\$19,622
13 - Beulah Rd @ Church St	\$67,113	\$350,000 ⁽²⁾
14 - Follin Ln @ Echols St	\$0	\$375,000 ⁽³⁾
15 - Maple Ave @ Vienna Plaza HAWK Signal	\$58,174	\$934
16 - Maple Ave @ James Madison HAWK Signal	\$14,510	\$934
17 - Electric Ave @ NFCU Drwy	\$0	\$91,569
McCain Transparency Traffic Management System (TMS)	\$30,000	\$0
Total	\$1,779,219	\$1,082,616

(1) Cost represents complete signal replacement. These two complete signal replacements will be bid separately from the other primary recommendations.

(2) Cost represents complete signal replacement and is in addition to Primary Recommendations. Note cost is slightly higher to include potential overhead utility work.

(3) Cost represents complete signal replacement and is slightly higher to account for installation of fiber optic cable over a long distance.

(4) This cost includes installing aerial fiber optic cable to the Town Hall.

APPENDIX A

Traffic Signal Equipment Inventory and Needs Assessment Forms



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Intersection 1

Route 243 (Nutley St) and Tapawingo Rd





Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Summary)

Date: 12/4/2018

Intersection #: 1

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Tapawingo Rd

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/20/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Nutley St (SW)	243	35
2 - Southbound	Nutley St (SW)	243	35
3 - Eastbound	Tapawingo Rd (SW)	6642	25
4 - Westbound	Tapawingo Rd (SW)	6642	25
5 -			
6 -			

Summary of Potential Scope:

No permit plan available.

The controller has a manual command programmed to run free operations.

Note that the Nutley St. SW Mixed Use Trail project currently in design overlaps this intersection in the SW quadrant. Any upgrades at this intersection should be coordinated with the trail project as it proceeds through design.

Primary Recommendations:

- Rebuild the entire signal including new signal poles, mast arms, controller cabinet, battery backup system, vehicular signal heads, pedestrian signal heads, APS push buttons, video detection, signs, conduit, junction boxes, and wiring.
- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Nutley St. at Courthouse Rd.
- Install CCTV camera with PTZ capabilities.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- None.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 1

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Tapawingo Rd

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB	___	___	TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of <u>4</u> VDOT Std. Mast Arms
	12"							0	
Vehicular Signal Qty (2-Section)	8"							0	Signal Supports: <u> </u> VDOT Std. Strain Poles
	12"							0	
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	<u> </u> Decorative Mast Arms
	12"	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>			<u>8</u>	
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	<u> </u> Decorative Strain Pole
	12"							0	
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	<u>4</u> Hand Hole on Pole (Yes or No)
	12"							0	
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0	<u> </u> Date Tag on Pole (Yes or No)
	12"							0	
Vehicular Signal Qty (4-Section FYA)	8"							0	<u> </u> Pedestal
	12"							0	
Vehicular Signal Qty (5-Section)	8"							0	Condition of <u> </u> Good <u>X</u> Poor
	12"	<u>1</u>	<u>1</u>					<u>2</u>	
"X" if Incandescent								-	Signal Supports: <u> </u> Remarks: Painted green, chipping
"X" if LED		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			-	
(Qty) of Opt Programmed								0	Strain Pole Bottom <u> </u> Present <u> </u> Not Present
(Qty) of Visors		<u>11</u>	<u>11</u>	<u>6</u>	<u>6</u>			<u>34</u>	
(Qty) of Backplates, Black								0	Tether Wire: <u> </u> Remarks: N/A
(Qty) of Backplates, High Visibility								0	
(Qty) of Louvers								0	Vehicular <u>X</u> Good <u> </u> Poor
(Qty) of Signal Strobes								0	
Pedestrian Signal Qty	SP-5							0	Signal Heads: <u> </u> Remarks: N/A
	SP-6							0	
	SP-7							0	
	SP-8	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>			<u>8</u>	
	SP-9							0	
"X" if Incandescent								-	Type & Number of <u>8</u> Strain Pole / Mast Arm
"X" if LED		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			-	
(Qty) of Tunnel Visors								0	Push Button <u> </u> Pedestal
(Qty) of Louvers		<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>			<u>8</u>	
Pedestrian Push Button Qty		<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>			<u>8</u>	Supports: <u> </u> Stub Pole
"X" if < 2 Inch Diameter Button								-	
"X" if 2 Inch Diameter Button		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			-	Remarks: N/A
"X" if APS								-	
Preemption								0	Preemption <u> </u> Emergency Vehicle
"X" if Optical									
"X" if Audible									Purpose: <u> </u> Railroad
"X" if Radio									
"X" if GPS									<u> </u> Transit
"X" if Confirmation Light									
Damaged/Faded Sign Qty								0	Signing & PM: <u> </u> Remarks: High visibility x-walks EB & WB
(Qty) of Overhead St Name Signs								0	
(Qty) of Internally Illuminated								0	Curb Ramp: <u> </u> Remarks: All new
(Qty) of LED Blank-Out Signs								0	
(Qty) of Flashing Warning Signs								0	Truncated Domes at all corners? <u> </u> Yes
Faded Pav't Markings Qty								0	
"X" if Curb Ramps Present		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>				Misc. Equip.: <u> </u> Remarks: N/A
"X" if Truncated Domes Present		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>				
Overhead Pole or Mast Arm Mounted Equipment									
"X" if Video Detectors		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>				
"X" if Radar Detectors									
"X" if Communication Ant.									



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 1

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Tapawingo Rd

Int. Street Name: -

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

NE Location (Quadrant)
40% Capacity (% Full)
Good Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

X Underground
 Overhead
 w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-3 Type A (Overhead) VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
 Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	11	PDC	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite autoscope terra	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, no date	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
N/A Does installation and operation conform with the permit plan?

Intersection #: 1

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Tapawingo Rd

Int. Street Name: -

Description: Route 243 (Nutley St)
Intersection Approach (NB)



Description: Route 243 (Nutley St)
Intersection Approach (SB)



Description: Tapawingo Rd
Intersection Approach (EB)



Description: Tapawingo Rd
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED)
and Police Access Panel



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 1

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Tapawingo Rd

Int. Street Name: -

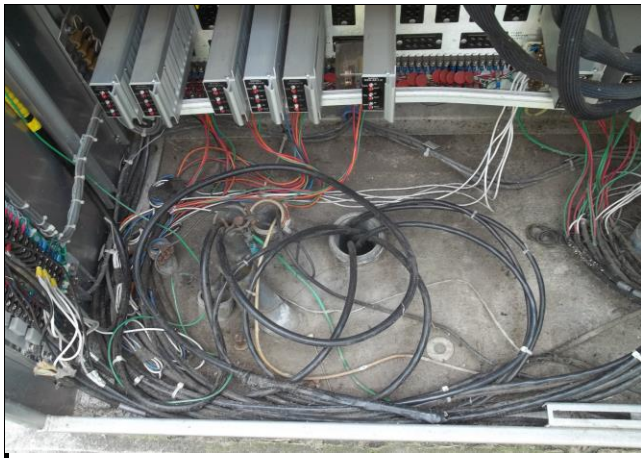
Description: Police Access Panel



Description: Uninterruptible Power Supply Cabinet (CLOSED)



Description: Traffic Signal Cabinet (OPEN)



Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (OPEN)



Description:



Intersection 2

Route 243 (Nutley St) and Courthouse Rd





Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Summary)

Date: 12/4/2018

Intersection #: 2

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Courthouse Rd

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/20/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Nutley St (SW)	243	35
2 - Southbound	Nutley St (SW)	243	35
3 - Eastbound	Courthouse Rd (SW)	6648	25
4 - Westbound	Courthouse Rd (SW)	6648	25
5 -			
6 -			

Summary of Potential Scope:

The signal is in compliance with the permit plan.

The controller has a manual command programmed to run free operations.

Primary Recommendations:

- Replace controller cabinet with McCain 352i ATC cabinet, riser, and attached Tesco battery backup system on existing foundation and either install new McCain ATC eX2 controller or existing McCain ATC eX controller with ITS Interface Module.
- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Nutley St at Maple Ave.
- Replace existing Autoscope Terra video detection cameras with new Autoscope Vision video detection cameras.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- Replace upraised hand on pedestrian signal in NE quadrant NB crosswalk.
- Install 3" retroreflective tape on all vehicular signal backplates.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 2

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Courthouse Rd

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment	NB	SB	EB	WB	___	___	TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"						0	Type & Number of 4 VDOT Std. Mast Arms
	12"						0	Signal Supports: VDOT Std. Strain Poles
Vehicular Signal Qty (2-Section)	8"						0	Decorative Mast Arms
	12"						0	Decorative Strain Pole
Vehicular Signal Qty (3-Section ALL SOLID)	8"						0	4 Hand Hole on Pole (Yes or No)
	12"	1	1	1	1		4	4 Date Tag on Pole (Yes or No)
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"						0	4 Pedestal
	12"						0	
Vehicular Signal Qty (3-Section ALL ARROWS)	8"						0	Condition of X Good ___ Poor
	12"						0	Signal Supports: Remarks: All new painted green
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"						0	All slightly discolored in spots
	12"						0	
Vehicular Signal Qty (4-Section FYA)	8"						0	Strain Pole Bottom ___ Present ___ Not Present
	12"						0	Tether Wire: Remarks: N/A
Vehicular Signal Qty (5-Section)	8"						0	
	12"	1	1	1	1		4	
"X" if Incandescent							-	
"X" if LED		X	X	X	X		-	
(Qty) of Opt Programmed							0	Vehicular X Good ___ Poor
(Qty) of Visors		8	8	8	8		32	Signal Heads: Remarks: N/A
(Qty) of Backplates, Black		2	2	2	2		8	
(Qty) of Backplates, High Visibility							0	
(Qty) of Louvers							0	
(Qty) of Signal Strobes							0	Pedestrian X Good ___ Poor
Pedestrian Signal Qty	SP-5						0	Signal Heads: Remarks: Ped head NE quad
	SP-6						0	NB x-walk upraised hand doesn't work
	SP-7						0	
	SP-8	2	2	2	2		8	
	SP-9						0	Type & Number of ___ Strain Pole / Mast Arm
"X" if Incandescent							-	Push Button 8 Pedestal
"X" if LED		X	X	X	X		-	Supports: Stub Pole
(Qty) of Tunnel Visors							0	Remarks: N/A
(Qty) of Louvers							0	
Pedestrian Push Button Qty							0	
"X" if < 2 Inch Diameter Button							-	
"X" if 2 Inch Diameter Button		X	X	X	X		-	Preemption ___ Emergency Vehicle
"X" if APS		X	X	X	X		-	Purpose: ___ Railroad
Preemption							0	___ Transit
"X" if Optical								
"X" if Audible								Signing & PM: Remarks: All high visibility x-walks
"X" if Radio								
"X" if GPS								
"X" if Confirmation Light								
Damaged/Faded Sign Qty							0	
(Qty) of Overhead St Name Signs							0	Curb Ramp: Remarks: All new.
(Qty) of Internally Illuminated							0	
(Qty) of LED Blank-Out Signs							0	
(Qty) of Flashing Warning Signs							0	
Faded Pav't Markings Qty							0	
"X" if Curb Ramps Present		X	X	X	X			Truncated Domes at all corners? Yes
"X" if Truncated Domes Present		X	X	X	X			
Overhead Pole or Mast Arm Mounted Equipment								
"X" if Video Detectors		X	X	X	X			Misc. Equip.: Remarks: N/A
"X" if Radar Detectors								
"X" if Communication Ant.								



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 2

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Courthouse Rd

Int. Street Name: -

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

SW Location (Quadrant)
40% Capacity (% Full)
Good Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

X Underground
 Overhead
X w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-5 VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
X Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	EDI	
Load Switch / Switch Pack	11	Econolite	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite autoscope terra	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, no date	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
Yes Does installation and operation conform with the permit plan?

Intersection #: 2

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Courthouse Rd

Int. Street Name: -

Description: Route 243 (Nutley St)
Intersection Approach (NB)



Description: Route 243 (Nutley St)
Intersection Approach (SB)



Description: Courthouse Rd
Intersection Approach (EB)



Description: Courthouse Rd
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED)
and Police Access Panel



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 2

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Courthouse Rd

Int. Street Name: -

Description: Police Access Panel



Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (OPEN)



Description: Uninterruptible Power Supply Cabinet



Description: _____

Description: _____



Intersection 3

Route 123 (Maple Ave) and Route 243 (Nutley St)





Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Summary)

Date: 12/20/2018

Intersection #: 3

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Route 243 (Nutley St)

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/20/2018 (Updated on 9/20/2018)

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Nutley St (SW)	243	35
2 - Southbound	Nutley St (NW)	243	35
3 - Eastbound	Maple Ave (W)	123	30
4 - Westbound	Maple Ave (W)	123	30
5 -			
6 -			

Summary of Potential Scope:

No permit plan available.

Town of Vienna public works indicated that the controller cabinet at this intersection was a temporary cabinet.

- During a follow up meeting on 11/7/2018, the Town of Vienna indicated that they had replaced the temporary controller cabinet with a permanent cabinet.

During the initial field view, it was noted that display of a circular red concurrently with a straight-through green arrow occurs on the NB Nutley Street approach when the pedestrian button is actuated which violates MUTCD Section 4D.05. To address this, three options that will continue to allow right turns on red when pedestrians are not present or when the pushbutton is not actuated were discussed during a follow up meeting on 11/7/2018.

- Install a "Right Turn Signal" (R10-10) sign in accordance with the MUTCD.
- Remove the right turn signal indication and existing "No Turn on Red When Pedestrians are Present" sign, and install an LED "No Turn on Red" blank-out sign that prohibits right turns on red upon pedestrian actuation.
- Remove the right turn signal indication and existing "No Turn on Red When Pedestrians are Present" sign, and install a 5-section right turn overlap signal head for the right turn lane along with a "Turning Vehicles Yield to Pedestrians" (R10-15) sign.

The Town of Vienna noted during a follow up meeting on 11/7/2018 that any changes to right turn and pedestrian operations on the northbound Maple Avenue approach will be coordinated with the proposed site work on the corner of this intersection.

Primary Recommendations:

- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and HAWK signal at Vienna Plaza.
- Replace existing Autoscope Terra video detection cameras with new Autoscope Vision video detection cameras.
- Install CCTV camera with PTZ capabilities.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Retrofit SB (Nutley St) left turn signal red solid and yellow solid indications with red arrow and yellow arrow indications.
- Retrofit NB (Nutley St) left turn signal red solid indication with red arrow indication.
- Replace existing electrical service.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- Verify all APS push buttons are operating properly and repair the ones that are not. Some emitted incorrect sound or no sound at all.
- Install 3" retroreflective tape on NB, SB, and WB vehicular signal backplates.
- Replace existing 5-section vehicular signal heads EB & WB (Maple Ave) with 4-section flashing yellow arrow signals, install "Left Turn Yield On Flashing Yellow Arrow" sign, and reprogram controller.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/20/2018

Intersection #: 3

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Route 243 (Nutley St)

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment	NB	SB	EB	WB	___	___	TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"						0	Type & Number of
	12"						0	Signal Supports:
Vehicular Signal Qty (2-Section)	8"						0	VDOT Std. Mast Arms
	12"						0	VDOT Std. Strain Poles
Vehicular Signal Qty (3-Section ALL SOLID)	8"						0	4 Decorative Mast Arms
	12"						0	Decorative Strain Pole
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"						0	4 Hand Hole on Pole (Yes or No)
	12"	2	2	2			6	Date Tag on Pole (Yes or No)
Vehicular Signal Qty (3-Sect, 2 SOLID & G ARROW)	8"						0	3 Pedestal
	12"	2					2	Condition of
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"						0	X Good ___ Poor
	12"		1				1	Signal Supports: Remarks: Painted green
Vehicular Signal Qty (4-Sect, 2 SOLID & 2 ARROWS)	8"						0	
	12"						0	
Vehicular Signal Qty (5-Section)	8"						0	Strain Pole Bottom Present ___ Not Present
	12"	1					1	Tether Wire: Remarks: N/A
"X" if Incandescent							-	
"X" if LED		X	X	X	X		-	
(Qty) of Opt Programmed							0	Vehicular
(Qty) of Visors		10	9	11	11		41	X Good ___ Poor
(Qty) of Backplates, Black		3	3		3		9	Signal Heads: Remarks: N/A
(Qty) of Backplates, High Visibility				3			3	
(Qty) of Louvers							0	
(Qty) of Signal Strobes							0	Pedestrian
Pedestrian Signal Qty	SP-5						0	X Good ___ Poor
	SP-6						0	Signal Heads: Remarks: N/A
	SP-7						0	
	SP-8	2	2	2	2		8	
	SP-9						0	Type & Number of
"X" if Incandescent							-	2 Strain Pole / Mast Arm
"X" if LED		X	X	X	X		-	Push Button
(Qty) of Tunnel Visors							0	6 Pedestal
(Qty) of Louvers		2	2	2	2		8	Supports: Stub Pole
Pedestrian Push Button Qty		2	2	2	2		8	Remarks: Some push buttons emitting incorrect sound or no sound during walk indication
"X" if < 2 Inch Diameter Button							-	
"X" if 2 Inch Diameter Button		X	X	X	X		-	Preemption
"X" if APS		X	X	X	X		-	Emergency Vehicle
Preemption							0	Purpose: Railroad
"X" if Optical								Transit
"X" if Audible								Signing & PM: Remarks: All high visibility x-walks
"X" if Radio								
"X" if GPS								
"X" if Confirmation Light								
Damaged/Faded Sign Qty							0	Curb Ramp: Remarks: All new
(Qty) of Overhead St Name Signs		1	1	1	1		4	
(Qty) of Internally Illuminated							0	
(Qty) of LED Blank-Out Signs							0	
(Qty) of Flashing Warning Signs							0	
Faded Pav't Markings Qty							0	Truncated Domes at all corners? Yes
"X" if Curb Ramps Present		X	X	X	X			
"X" if Truncated Domes Present		X	X	X	X			
Overhead Pole or Mast Arm Mounted Equipment								
"X" if Video Detectors		X	X	X	X			Misc. Equip.: Remarks: N/A
"X" if Radar Detectors								
"X" if Communication Ant.								



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/20/2018

Intersection #: 3

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Route 243 (Nutley St)

Int. Street Name: -

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

SE Location (Quadrant)
40% Capacity (% Full)
Good Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

X Underground
 Overhead
 w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-4 Type A (Overhead) VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
 Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.; temporary cabinet
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	12	PDC	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite autoscope terra	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, date 6/17	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
No Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
N/A Does installation and operation conform with the permit plan?

Intersection #: 3

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Route 243 (Nutley St)

Int. Street Name: -

Description: Route 243 (Nutley St)
Intersection Approach (NB)



Description: Route 243 (Nutley St)
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet Door (OPEN) and
Police Access Panel and Cabinet Conduit Elbow



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 3

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Route 243 (Nutley St)

Int. Street Name: -

Description: Traffic Signal Cabinet (OPEN)



Description: Electrical Service Disconnect



Description: Police Access Panel



Description: Uninterruptible Power Supply Cabinet (OPEN)



Description: Uninterruptible Power Supply Cabinet (OPEN)



Description: Route 243 (Nutley St) Northbound Approach
MUTCD compliance issue



Intersection 4

Route 123 (Maple Ave) and Courthouse Rd and Lawyers Rd





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 4

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Courthouse Rd

Int. Street Name: Lawyers Rd

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/20/2018 and 9/20/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Courthouse Rd	6648	25
2 - Southbound	Lawyers Rd	6648	25
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

The signal is not in compliance with the permit plan. The permit plan shows 3-section protected left turn signals EB & WB along Maple Ave and NB Courthouse Road and SB Lawyers Road; however, the left turn signals have been changed to 4-section flashing yellow arrow signals for all approaches.

Primary Recommendations:

- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Maple Ave at Center St.
- Replace existing Autoscope Terra video detection cameras with new Autoscope Vision video detection cameras.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- Verify all APS push buttons are operating properly and repair the ones that are not. Some emitted incorrect sound or no sound at all.
 - APS pushbutton on Southwest corner is damaged (front cover falling off).
- Replace faded NB stop bar pavement marking.
- Install 3" retroreflective tape on all vehicular signal backplates except EB, WB, NB, & SB 4-section FYA signals which already have retroreflective tape.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 4

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Courthouse Rd

Int. Street Name: Lawyers Rd

General Signal Equipment Inventory:

Signal Equipment	NB	SB	EB	WB	___	___	TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"						0	Type & Number of <u>4</u> VDOT Std. Mast Arms
	12"						0	Signal Supports: <u> </u> VDOT Std. Strain Poles
								<u> </u> Decorative Mast Arms
								<u> </u> Decorative Strain Pole
Vehicular Signal Qty (2-Section)	8"						0	<u>4</u> Hand Hole on Pole (Yes or No)
	12"						0	<u>4</u> Date Tag on Pole (Yes or No)
Vehicular Signal Qty (3-Section ALL SOLID)	8"						0	<u>3</u> Pedestal
	12"	2	2	2	2		8	
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"						0	Condition of <u>X</u> Good <u> </u> Poor
	12"						0	Signal Supports: <u> </u> Remarks: All new painted green
Vehicular Signal Qty (3-Section ALL ARROWS)	8"						0	
	12"						0	
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"						0	Strain Pole Bottom <u> </u> Present <u> </u> Not Present
	12"						0	Tether Wire: <u> </u> Remarks: N/A
Vehicular Signal Qty (4-Section FYA)	8"						0	
	12"	1	1	1	1		4	
Vehicular Signal Qty (5-Section)	8"						0	
	12"						0	
"X" if Incandescent							-	
"X" if LED		X	X	X	X		-	
(Qty) of Opt Programmed							0	Vehicular <u>X</u> Good <u> </u> Poor
(Qty) of Visors		9	9	10	10		38	Signal Heads: <u> </u> Remarks: All new
(Qty) of Backplates, Black		3	3	2	2		10	
(Qty) of Backplates, High Visibility		1	1	1	1		4	
(Qty) of Louvers							0	
(Qty) of Signal Strobes							0	Pedestrian <u>X</u> Good <u> </u> Poor
Pedestrian Signal Qty	SP-5						0	Signal Heads: <u> </u> Remarks: All new
	SP-6						0	
	SP-7						0	
	SP-8	2	2	2	2		8	
	SP-9						0	
"X" if Incandescent							-	Type & Number of <u>2</u> Strain Pole / Mast Arm
"X" if LED		X	X	X	X		-	Push Button <u>6</u> Pedestal
(Qty) of Tunnel Visors							0	Supports: <u> </u> Stub Pole
(Qty) of Louvers		2	2	2	2		8	Remarks: Most push buttons emitting incorrect sound or no sound during walk indication
Pedestrian Push Button Qty		2	2	2	2		8	
"X" if < 2 Inch Diameter Button							-	Preemption <u> </u> Emergency Vehicle
"X" if 2 Inch Diameter Button		X	X	X	X		-	Purpose: <u> </u> Railroad
"X" if APS		X	X	X	X		-	<u> </u> Transit
Preemption							0	
"X" if Optical								Signing & PM: <u> </u> Remarks: Faded stop bar NB
"X" if Audible								<u> </u> Brick x-walks
"X" if Radio								
"X" if GPS								
"X" if Confirmation Light								
Damaged/Faded Sign Qty							0	Curb Ramp: <u> </u> Remarks: All new. Shared landings.
(Qty) of Overhead St Name Signs							0	
(Qty) of Internally Illuminated							0	
(Qty) of LED Blank-Out Signs							0	
(Qty) of Flashing Warning Signs							0	
Faded Pav't Markings Qty		20					20	Truncated Domes at all corners? <u>Yes</u>
"X" if Curb Ramps Present		X	X	X	X			
"X" if Truncated Domes Present		X	X	X	X			
Overhead Pole or Mast Arm Mounted Equipment								
"X" if Video Detectors		X	X	X	X			Misc. Equip.: <u> </u> Remarks: N/A
"X" if Radar Detectors								
"X" if Communication Ant.								



Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 4

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Courthouse Rd

Int. Street Name: Lawyers Rd

Cabinet Type:

 NEMA
 Type 170
 Electromechanical
 Flasher
 X ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
 X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
 X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

 X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

 SE Location (Quadrant)
 55% Capacity (% Full)
 Good Overall Condition (Good / Poor)
 N/A Bottom Condition (Rusted ?)
 N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
 CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

 X Underground
 Overhead
 X w/ Meter
 No Rust Disconnect Enclosure
Condition (Rusted ?)
 SE-3 Type B (Underground) VDOT Standard
(SE-1 thru SE-11)

Accessories

 X Police Access Panel
 X Manual Cord
 X Generator Adaptor Kit
 UPS (Separate Cab.)
 X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.; pull-out drawer
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Cabinet Monitor Unit / CMU	1	McCain 2212-HV	
Auxiliary Display Unit / ADU	1	EDI 2220	
Switch Pack / Flasher Unit HDSP / HDFU	9	(8) HDSP: McCain 2202-HV, (1) HDFU: McCain 2202-HV	
Isolator Card	2	EDI 242L	
Serial Interface Unit / SIU	2	EDI 2218	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite autoscope terra	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, no date	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

 Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
 Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
 N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
 No Does installation and operation conform with the permit plan?

Intersection #: 4

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Courthouse Rd

Int. Street Name: Lawyers Rd

Description: Courthouse Rd
Intersection Approach (NB)



Description: Courthouse Rd
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (OPEN)



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 4

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Courthouse Rd

Int. Street Name: Lawyers Rd

Description: Police Access Panel



Description: Electrical Service Disconnect



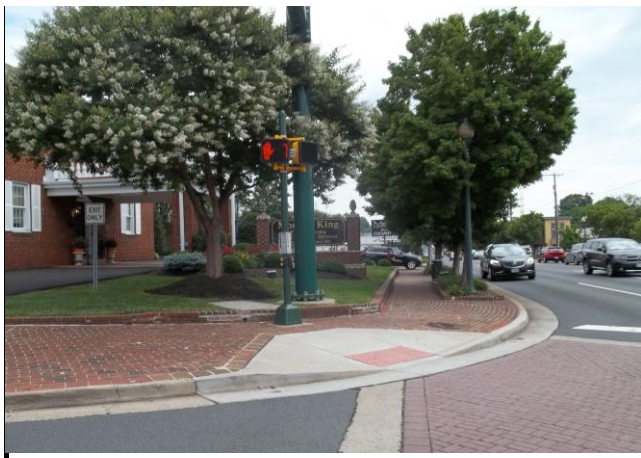
Description: Uninterruptible Power Supply Cabinet (OPEN)



Description: Uninterruptible Power Supply Cabinet (OPEN)



Description: Accessible Pedestrian Signals (APS)



Description: Accessible Pedestrian Signals (APS) (Damaged)



Intersection 5

Route 123 (Maple Ave) and Center St





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/20/2018

Intersection #: 5

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Center St

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Center St	-	25
2 - Southbound	Center St	-	25
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

The signal is in compliance with the permit plan.

Primary Recommendations:

- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Maple Ave at Washington and Old Dominion (W&OD) Trail.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Town Hall (to be evaluated).
- Replace existing Autoscope Terra video detection cameras with new Autoscope Vision video detection cameras.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- Install 3" retroreflective tape on all vehicular signal backplates.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/20/2018

Intersection #: 5

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Center St

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB			TOTAL	"X" All that Apply			
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of 4 VDOT Std. Mast Arms			
	12"							0		Signal Supports: VDOT Std. Strain Poles		
Vehicular Signal Qty (2-Section)	8"							0	Decorative Mast Arms			
	12"							0		Decorative Strain Pole		
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	4 Hand Hole on Pole (Yes or No)			
	12"	1	1	1	1			4		4 Date Tag on Pole (Yes or No)		
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	4 Pedestal			
	12"							0		Condition of X Good Poor		
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	Signal Supports: Remarks: All new painted green			
	12"							0		Strain Pole Bottom Present Not Present		
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0	Tether Wire: Remarks: N/A			
	12"							0		Vehicular X Good Poor		
Vehicular Signal Qty (4-Section FYA)	8"							0	Signal Heads: Remarks: All new			
	12"							0		Pedestrian X Good Poor		
Vehicular Signal Qty (5-Section)	8"							0	Signal Heads: Remarks: All new			
	12"	1	1	1	1			4		Type & Number of Strain Pole / Mast Arm		
"X" if Incandescent								-	Push Button 8 Pedestal			
"X" if LED		X	X	X	X			-		Supports: Stub Pole		
(Qty) of Opt Programmed								0	Remarks: All new			
(Qty) of Visors		8	8	8	8			32		Preemption Emergency Vehicle		
(Qty) of Backplates, Black		2	2	2	2			8	Purpose: Railroad			
(Qty) of Backplates, High Visibility								0		Transit		
(Qty) of Louvers								0	Signing & PM: Remarks: All Good			
(Qty) of Signal Strobes								0		Brick x-walks		
Pedestrian Signal Qty	SP-5							0	Curb Ramp: Remarks: All new. Shared landings.			
	SP-6							0		Truncated Domes at all corners? Yes		
	SP-7							0			Misc. Equip.: Remarks: N/A	
	SP-8	2	2	2	2			8				Remarks: All new. Shared landings.
	SP-9							0				
"X" if Incandescent								-	Remarks: All new. Shared landings.			
"X" if LED		X	X	X	X			-		Remarks: All new. Shared landings.		
(Qty) of Tunnel Visors								0			Remarks: All new. Shared landings.	
(Qty) of Louvers		2	2	2	2			8				Remarks: All new. Shared landings.
Pedestrian Push Button Qty								0				
"X" if < 2 Inch Diameter Button								-	Remarks: All new. Shared landings.			
"X" if 2 Inch Diameter Button		X	X	X	X			-		Remarks: All new. Shared landings.		
"X" if APS		X	X	X	X			-			Remarks: All new. Shared landings.	
Preemption								0				Remarks: All new. Shared landings.
"X" if Optical												
"X" if Audible									Remarks: All new. Shared landings.			
"X" if Radio										Remarks: All new. Shared landings.		
"X" if GPS											Remarks: All new. Shared landings.	
"X" if Confirmation Light												Remarks: All new. Shared landings.
Damaged/Faded Sign Qty								0				
(Qty) of Overhead St Name Signs								0	Remarks: All new. Shared landings.			
(Qty) of Internally Illuminated								0		Remarks: All new. Shared landings.		
(Qty) of LED Blank-Out Signs								0			Remarks: All new. Shared landings.	
(Qty) of Flashing Warning Signs								0				Remarks: All new. Shared landings.
Faded Pav't Markings Qty								0				
"X" if Curb Ramps Present		X	X	X	X				Remarks: All new. Shared landings.			
"X" if Truncated Domes Present		X	X	X	X					Remarks: All new. Shared landings.		
Overhead Pole or Mast Arm Mounted Equipment											Remarks: All new. Shared landings.	
"X" if Video Detectors		X	X	X	X							Remarks: All new. Shared landings.
"X" if Radar Detectors												
"X" if Communication Ant.									Remarks: All new. Shared landings.			
										Remarks: All new. Shared landings.		



Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/20/2018

Intersection #: 5

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Center St

Int. Street Name: -

Cabinet Type:

 NEMA
 Type 170
 Electromechanical
 Flasher
 X ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
 X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
 X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

 X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

 SE Location (Quadrant)
 40% Capacity (% Full)
 Good Overall Condition (Good / Poor)
 N/A Bottom Condition (Rusted ?)
 N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
 CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

 X Underground
 Overhead
 X w/ Meter
 No Rust Disconnect Enclosure
Condition (Rusted ?)
 SE-3 Type B (Underground) VDOT Standard
(SE-1 thru SE-11)

Accessories

 X Police Access Panel
 X Manual Cord
 X Generator Adaptor Kit
 UPS (Separate Cab.)
 X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Cabinet Monitor Unit / CMU	1	McCain 2212-HV	
Auxiliary Display Unit / ADU	1	EDI 2220	
Switch Pack / Flasher Unit HDSP / HDFU	9	(8) HDSP: McCain 2202-HV, (1) HDFU: McCain 2202-HV	
Isolator Card	2	EDI 242L	
Serial Interface Unit / SIU	2	EDI 2218	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite autoscope terra	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, date 4/17	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

 Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
 Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
 N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
 Yes Does installation and operation conform with the permit plan?

Intersection #: 5

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Center St

Int. Street Name: -

Description: Center St
Intersection Approach (NB)



Description: Center St
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED) and
Uninterruptible Power Supply Cabinet



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 5

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Center St

Int. Street Name: -

Description: Cabinet Conduit Elbow



Description: Electrical Service Disconnect



Description: Electrical Service Meter



Description: Accessible Pedestrian Signals (APS)



Description: Accessible Pedestrian Signals (APS)

Description: _____



Intersection 6

Route 123 (Maple Ave) and Washington & Old Dominion Trail



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**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 6

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Washington & Old Dominion Trail

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018 (Updated on 9/20/2018)

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Washington & Old Dominion Trail	-	-
2 - Southbound	Washington & Old Dominion Trail	-	-
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

No permit plan available.

Primary Recommendations:

- Replace controller cabinet with McCain 352i ATC cabinet, riser, and attached Tesco battery backup system on existing foundation and either install new McCain ATC eX2 controller or existing McCain ATC eX controller with ITS Interface Module.
- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Maple Ave at Park St.
- Upgrade existing trail curb ramps with detectable warning surface to be ADA compliant.
- Install new pedestrian push button on stub pole along NB W&OD Trail farther from Maple Ave.

Secondary Recommendations:

- Repaint existing mast arms.
- Install electronic security lock on controller cabinet.
- Replace existing electrical service.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- Replace faded NB & SB stop bar pavement markings.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 6

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Washington & Old Dominion Trail

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment	NB	SB	EB	WB	___	___	TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"						0	Type & Number of <u>2</u> VDOT Std. Mast Arms
	12"						0	Signal Supports: <u> </u> VDOT Std. Strain Poles
Vehicular Signal Qty (2-Section)	8"						0	<u> </u> Decorative Mast Arms
	12"						0	<u> </u> Decorative Strain Pole
Vehicular Signal Qty (3-Section ALL SOLID)	8"						0	<u>2</u> Hand Hole on Pole (Yes or No)
	12"			2	2		4	<u>2</u> Date Tag on Pole (Yes or No)
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"						0	<u> </u> Pedestal
	12"						0	Condition of <u>X</u> Good <u> </u> Poor
Vehicular Signal Qty (3-Section ALL ARROWS)	8"						0	Signal Supports: <u> </u> Remarks: Painted green, chipping
	12"						0	<u> </u> Some rust.
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"						0	Strain Pole Bottom <u> </u> Present <u> </u> Not Present
	12"						0	Tether Wire: <u> </u> Remarks: N/A
Vehicular Signal Qty (4-Section FYA)	8"						0	
	12"						0	
Vehicular Signal Qty (5-Section)	8"						0	
	12"						0	
"X" if Incandescent							-	
"X" if LED			X	X			-	
(Qty) of Opt Programmed							0	Vehicular <u>X</u> Good <u> </u> Poor
(Qty) of Visors			6	6			12	Signal Heads: <u> </u> Remarks: N/A
(Qty) of Backplates, Black							0	
(Qty) of Backplates, High Visibility			2	2			4	
(Qty) of Louvers							0	
(Qty) of Signal Strobes							0	Pedestrian <u>X</u> Good <u> </u> Poor
Pedestrian Signal Qty	SP-5						0	Signal Heads: <u> </u> Remarks: N/A
	SP-6						0	
	SP-7						0	
	SP-8	1	1				2	
	SP-9						0	
"X" if Incandescent							-	Type & Number of <u>1</u> Strain Pole / Mast Arm
"X" if LED	X	X					-	Push Button <u>1</u> Pedestal
(Qty) of Tunnel Visors							0	Supports: <u> </u> Stub Pole
(Qty) of Louvers	1	1					2	Remarks: N/A
Pedestrian Push Button Qty	1	1					2	
"X" if < 2 Inch Diameter Button							-	
"X" if 2 Inch Diameter Button	X	X					-	Preemption <u> </u> Emergency Vehicle
"X" if APS	X	X					-	Purpose: <u> </u> Railroad
Preemption							0	<u> </u> Transit
"X" if Optical								
"X" if Audible								Signing & PM: <u> </u> Remarks: Faded stopbars NB & SB
"X" if Radio								
"X" if GPS								
"X" if Confirmation Light								
Damaged/Faded Sign Qty							0	
(Qty) of Overhead St Name Signs							0	Curb Ramp: <u> </u> Remarks: None present
(Qty) of Internally Illuminated							0	
(Qty) of LED Blank-Out Signs							0	
(Qty) of Flashing Warning Signs							0	
Faded Pav't Markings Qty			8	8			16	
"X" if Curb Ramps Present								Truncated Domes at all corners? <u>No</u>
"X" if Truncated Domes Present								
Overhead Pole or Mast Arm Mounted Equipment								
"X" if Video Detectors								Misc. Equip.: <u> </u> Remarks: N/A
"X" if Radar Detectors								
"X" if Communication Ant.								



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 6

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Washington & Old Dominion Trail

Int. Street Name: -

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
X Semi-Actuated
 Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

SW Location (Quadrant)
35% Capacity (% Full)
Poor Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
 (CF-1, CF-3, CF-4)

Power Source

 Underground
X Overhead
 w/ Meter
No Rust Disconnect Enclosure
 Condition (Rusted ?)
SE-4 Type A (Overhead) VDOT Standard
 (SE-1 thru SE-11)

Accessories

X Police Access Panel
 Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
 UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	2	PDC	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module			
Preemption Module			
UPS / Battery Backup			
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

N/A Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
N/A Does installation and operation conform with the permit plan?

Intersection #: 6

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Washington & Old Dominion Trail

Int. Street Name: -

Description: Washington & Old Dominion Trail
Intersection Approach (NB)



Description: Washington & Old Dominion Trail
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED)
and Police Access Panel



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 6

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Washington & Old Dominion Trail

Int. Street Name: -

Description: Police Access Panel (Open)



Description: Electrical Service Disconnect



Description: Traffic Signal Cabinet Generator Connection
and GPS Clock Sensor



Description: Accessible Pedestrian Signals (APS)



Description: Accessible Pedestrian Signals (APS)



Intersection 7

Route 123 (Maple Ave) and Park St





Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Summary)

Date: 12/4/2018

Intersection #: 7

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Park St

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Park St	6676	25
2 - Southbound	Park St	6676	25
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

A permit plan of existing conditions was not available; however, this traffic signal is scheduled for full replacement in the near future (advertisement ≈ 2020) and the new design plan is available.

The new signal should include a McCain 352i ATC cabinet and attached Tesco battery backup system, McCain ATC eX2 controller, and Autoscope Vision video detection cameras to be fully compatible and consistent with future adaptive signal control plans.

It was noted during the inventory that the curb ramp in the SW quadrant has ADA compliance issues due to an existing metal fence creating a barrier to the pedestrian push button. The current signal design plan (scheduled for advertisement in 2020) proposes to reset this fence and eliminate the barrier/reach issues.

Primary Recommendations:

- Install 10 port Ethernet switch.
- Install underground single-mode fiber optic cable in existing underground conduit between this intersection and Maple Ave at Glyndon St.
- Install two junction boxes between this intersection and Maple Ave at Glyndon St to intercept fiber optic cable run and improve ease of pulling cable (Total run is 680', 2 junction boxes makes max pull 230').

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- None.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 7

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Park St

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment	NB	SB	EB	WB	___	___	TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"						0	Type & Number of 2 VDOT Std. Mast Arms
	12"						0	Signal Supports: VDOT Std. Strain Poles
Vehicular Signal Qty (2-Section)	8"						0	Decorative Mast Arms
	12"						0	Decorative Strain Pole
Vehicular Signal Qty (3-Section ALL SOLID)	8"						0	Hand Hole on Pole (Yes or No)
	12"	1	1	1	1		4	Date Tag on Pole (Yes or No)
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"						0	2 Pedestal
	12"						0	
Vehicular Signal Qty (3-Section ALL ARROWS)	8"						0	Condition of Good X Poor
	12"						0	Signal Supports: Remarks: Painted green, chipping
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"						0	
	12"						0	
Vehicular Signal Qty (4-Section FYA)	8"						0	Strain Pole Bottom Present Not Present
	12"						0	Tether Wire: Remarks: N/A
Vehicular Signal Qty (5-Section)	8"						0	
	12"	1	1	1	1		4	
"X" if Incandescent		X	X	X	X		-	
"X" if LED							-	
(Qty) of Opt Programmed							0	Vehicular Good X Poor
(Qty) of Visors							0	Signal Heads: Remarks: Paint chipping
(Qty) of Backplates, Black							0	WB & SB 5-sect yellow & red 8"
(Qty) of Backplates, High Visibility							0	
(Qty) of Louvers							0	
(Qty) of Signal Strobes							0	Pedestrian X Good Poor
Pedestrian Signal Qty	SP-5						0	Signal Heads: Remarks: SW quad EB crossing
	SP-6	2	2	2	2		8	ped head defective
	SP-7						0	
	SP-8						0	
	SP-9						0	
"X" if Incandescent							-	Type & Number of 2 Strain Pole / Mast Arm
"X" if LED		X	X	X	X		-	Push Button 2 Pedestal
(Qty) of Tunnel Visors							0	Supports: Stub Pole
(Qty) of Louvers		2	2	2	2		8	Remarks: N/A
Pedestrian Push Button Qty		2	2	2	2		8	
"X" if < 2 Inch Diameter Button							-	
"X" if 2 Inch Diameter Button		X	X	X	X		-	Preemption Emergency Vehicle
"X" if APS							-	Purpose: Railroad
Preemption							0	Transit
"X" if Optical								
"X" if Audible								Signing & PM: Remarks: Brick x-walks
"X" if Radio								Faded stop bar NB & SB
"X" if GPS								
"X" if Confirmation Light								
Damaged/Faded Sign Qty							0	
(Qty) of Overhead St Name Signs							0	Curb Ramp: Remarks: All new. Shared landings.
(Qty) of Internally Illuminated							0	
(Qty) of LED Blank-Out Signs							0	
(Qty) of Flashing Warning Signs							0	
Faded Pav't Markings Qty				20	20		40	
"X" if Curb Ramps Present		X	X	X	X			Truncated Domes at all corners? Yes
"X" if Truncated Domes Present		X	X	X	X			
Overhead Pole or Mast Arm Mounted Equipment								
"X" if Video Detectors		X	X	X	X			Misc. Equip.: Remarks: N/A
"X" if Radar Detectors								
"X" if Communication Ant.								



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 7

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Park St

Int. Street Name: -

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
X Permit Plan Present
 Moisture Issues

Cabinet Details:

SE Location (Quadrant)
75% Capacity (% Full)
Poor Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

 Underground
X Overhead
 w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-3 Type A (Overhead) VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
X Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
 UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	13	PDC	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite Autoscope Vision	
Preemption Module			
UPS / Battery Backup			
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
N/A Does installation and operation conform with the permit plan?

Intersection #: 7

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Park St

Int. Street Name: -

Description: Park St
Intersection Approach (NB)



Description: Park St
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (OPEN)
and Police Access Panel



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 7

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Park St

Int. Street Name: -

Description: Police Access Panel



Description: Electrical Service Disconnect



Description: Traffic Signal Cabinet Generator Adaptor



Description: Pedestrian Signal, ADA compliance issues



Description: Pedestrian Signal, ADA compliance issues



Description: Pedestrian Signal, ADA compliance issues



Intersection 8

Route 123 (Maple Ave) and Glyndon St





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 8

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Glyndon St

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018 (Updated on 9/20/2018)

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Glyndon St	-	25
2 - Southbound	Glyndon St	-	25
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

The signal is in compliance with the permit plan.

Primary Recommendations:

- Replace controller cabinet with McCain 352i ATC cabinet, riser, and attached Tesco battery backup system on existing foundation and either install new McCain ATC eX2 controller or existing McCain ATC eX controller with ITS Interface Module.
- Install 10 port Ethernet switch.
- Install underground single-mode fiber optic cable in existing underground conduit between this intersection and Maple Ave at Branch Rd.
- Install two junction boxes conduit between this intersection and Maple Ave at Branch Rd to intercept fiber optic cable run and improve ease of pulling cable (Total run is 770', 2 junction boxes makes max pull 260').
- Replace existing push buttons with APS push buttons.
- Replace existing pedestrian signals (SP-6) with new countdown pedestrian signals (SP-8) and new educational push button signs.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Replace existing electrical service.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- None.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 8

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Glyndon St

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB	___	___	TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of <u>4</u> VDOT Std. Mast Arms
	12"							0	
Vehicular Signal Qty (2-Section)	8"							0	Signal Supports: <u> </u> VDOT Std. Strain Poles
	12"							0	
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	<u> </u> Decorative Mast Arms
	12"	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>			4	
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	<u> </u> Decorative Strain Pole
	12"							0	
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	<u>4</u> Hand Hole on Pole (Yes or No)
	12"							0	
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0	<u> </u> Date Tag on Pole (Yes or No)
	12"							0	
Vehicular Signal Qty (4-Section FYA)	8"							0	<u> </u> Pedestal
	12"							0	
Vehicular Signal Qty (5-Section)	8"	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>			4	Condition of <u>X</u> Good <u> </u> Poor
	12"							0	
"X" if Incandescent								-	Signal Supports: <u> </u> Remarks: Painted green. Paint patch areas on all poles.
"X" if LED		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			-	
(Qty) of Opt Programmed								0	Strain Pole Bottom <u> </u> Present <u> </u> Not Present
(Qty) of Visors		<u>8</u>	<u>8</u>	<u>8</u>	<u>8</u>			32	
(Qty) of Backplates, Black								0	Tether Wire: <u> </u> Remarks: N/A
(Qty) of Backplates, High Visibility		<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>			8	
(Qty) of Louvers								0	Vehicular <u>X</u> Good <u> </u> Poor
(Qty) of Signal Strobes								0	
Pedestrian Signal Qty	SP-5							0	Signal Heads: <u> </u> Remarks: N/A
	SP-6	<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>			8	
	SP-7							0	
	SP-8							0	
	SP-9							0	
"X" if Incandescent								-	Pedestrian <u>X</u> Good <u> </u> Poor
"X" if LED		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			-	
(Qty) of Tunnel Visors								0	Signal Heads: <u> </u> Remarks: Not Countdown
(Qty) of Louvers		<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>			8	
Pedestrian Push Button Qty		<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>			8	Type & Number of <u>8</u> Strain Pole / Mast Arm
"X" if < 2 Inch Diameter Button								-	
"X" if 2 Inch Diameter Button		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			-	Push Button <u> </u> Pedestal
"X" if APS								-	
Preemption								0	Supports: <u> </u> Stub Pole
"X" if Optical									
"X" if Audible									Remarks: N/A
"X" if Radio									
"X" if GPS									Preemption <u> </u> Emergency Vehicle
"X" if Confirmation Light									
Damaged/Faded Sign Qty								0	Purpose: <u> </u> Railroad
(Qty) of Overhead St Name Signs								0	
(Qty) of Internally Illuminated								0	Signing & PM: <u> </u> Remarks: Brick x-walks
(Qty) of LED Blank-Out Signs								0	
(Qty) of Flashing Warning Signs								0	Curb Ramp: <u> </u> Remarks: All new. Shared landings. 4' Landing area behind type A ramps not provided.
Faded Pav't Markings Qty								0	
"X" if Curb Ramps Present		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>				Truncated Domes at all corners? <u> </u> Yes
"X" if Truncated Domes Present		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>				
Overhead Pole or Mast Arm Mounted Equipment									Misc. Equip.: <u> </u> Remarks: N/A
"X" if Video Detectors		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>				
"X" if Radar Detectors									
"X" if Communication Ant.									



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 8

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Glyndon St

Int. Street Name: -

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

SE Location (Quadrant)
50% Capacity (% Full)
Good Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

 Underground
X Overhead
 w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-4 Type A (Overhead) VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
 Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller		McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	13	PDC	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite Autoscope Vision	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, no date	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes, "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
Yes Does installation and operation conform with the permit plan?



**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Photograph Log)**

Date: 12/4/2018

Intersection #: 8

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Glyndon St

Int. Street Name: -

Description: Glyndon St
Intersection Approach (NB)



Description: Glyndon St
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED)
and Police Access Panel



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 8

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Glyndon St

Int. Street Name: -

Description: Police Access Panel



Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (Closed)



Description: Uninterruptible Power Supply Cabinet (Open)



Description: Traffic Signal Cabinet (OPEN)



Description: Non-Countdown Pedestrian Signal



Intersection 9

Route 123 (Maple Ave) and Branch Rd





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 9

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Branch Rd

Int. Street Name: Office Drwy

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Branch Rd	6934	25
2 - Southbound	Office Drwy	6934	-
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

The signal is in compliance with the permit plan.

Primary Recommendations:

- Replace controller cabinet with McCain 352i ATC cabinet, riser, and attached Tesco battery backup system on existing foundation and either install new McCain ATC eX2 controller or existing McCain ATC eX controller with ITS Interface Module.
- Install 10 port Ethernet switch.
- Install underground single-mode fiber optic cable in existing underground conduit between this intersection and Maple Ave at Beulah Rd.
- Replace existing push buttons with APS push buttons.
- Replace existing pedestrian signals (SP-6) with new countdown pedestrian signals (SP-8) and new educational push button signs.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- Replace faded NB stop bar pavement marking.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 9

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Branch Rd

Int. Street Name: Office Drwy

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB	___	___	TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of <u>2</u> VDOT Std. Mast Arms
	12"							0	
Vehicular Signal Qty (2-Section)	8"							0	Signal Supports: <u> </u> VDOT Std. Strain Poles
	12"							0	
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	<u> </u> Decorative Mast Arms
	12"	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>			4	
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	<u>2</u> Hand Hole on Pole (Yes or No)
	12"							0	
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	<u> </u> Date Tag on Pole (Yes or No)
	12"							0	
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0	<u>2</u> Pedestal
	12"	<u>1</u>	<u>1</u>					2	
Vehicular Signal Qty (4-Section FYA)	8"							0	Condition of <u>X</u> Good <u> </u> Poor
	12"							0	
Vehicular Signal Qty (5-Section)	8"							0	Signal Supports: <u> </u> Remarks: Painted green
	12"							2	
"X" if Incandescent								-	<u> </u> Dual mast arms
"X" if LED		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>			-	
(Qty) of Opt Programmed								0	Strain Pole Bottom <u> </u> Present <u> </u> Not Present
(Qty) of Visors		<u>7</u>	<u>7</u>	<u>8</u>	<u>8</u>			30	
(Qty) of Backplates, Black								0	Tether Wire: <u> </u> Remarks: N/A
(Qty) of Backplates, High Visibility		<u>2</u>	<u>2</u>	<u>2</u>	<u>2</u>			8	
(Qty) of Louvers								0	Vehicular <u>X</u> Good <u> </u> Poor
(Qty) of Signal Strobes								0	
Pedestrian Signal Qty	SP-5							0	Signal Heads: <u> </u> Remarks: N/A
	SP-6	<u>0</u>	<u>2</u>	<u>2</u>	<u>0</u>			4	
	SP-7							0	
	SP-8							0	
	SP-9							0	
"X" if Incandescent								-	Type & Number of <u>1</u> Strain Pole / Mast Arm
"X" if LED			<u>X</u>	<u>X</u>				-	
(Qty) of Tunnel Visors								0	Push Button <u>3</u> Pedestal
(Qty) of Louvers			<u>2</u>	<u>2</u>				4	
Pedestrian Push Button Qty			<u>2</u>	<u>2</u>				4	Supports: <u> </u> Stub Pole
"X" if < 2 Inch Diameter Button								-	
"X" if 2 Inch Diameter Button			<u>X</u>	<u>X</u>				-	Remarks: N/A
"X" if APS								-	
Preemption								0	Preemption <u> </u> Emergency Vehicle
"X" if Optical									
"X" if Audible									Purpose: <u> </u> Railroad
"X" if Radio									
"X" if GPS									<u> </u> Transit
"X" if Confirmation Light									
Damaged/Faded Sign Qty								0	Signing & PM: <u> </u> Remarks: Brick x-walks
(Qty) of Overhead St Name Signs								0	
(Qty) of Internally Illuminated								0	<u> </u> Faded stop bar NB
(Qty) of LED Blank-Out Signs								0	
(Qty) of Flashing Warning Signs								0	Curb Ramp: <u> </u> Remarks: All new. Shared landings.
Faded Pav't Markings Qty		<u>20</u>						20	
"X" if Curb Ramps Present			<u>X</u>	<u>X</u>					Truncated Domes at all corners? <u>Yes</u>
"X" if Truncated Domes Present			<u>X</u>	<u>X</u>					
Overhead Pole or Mast Arm Mounted Equipment									Misc. Equip.: <u> </u> Remarks: N/A
"X" if Video Detectors		<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>				
"X" if Radar Detectors									
"X" if Communication Ant.									



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 9

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Branch Rd

Int. Street Name: Office Drwy

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

SE Location (Quadrant)
40% Capacity (% Full)
Good Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

X Underground
 Overhead
 w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-3 Type B (Underground) VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
 Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	9	PDC	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite Autoscope Vision	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, no date	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
Yes Does installation and operation conform with the permit plan?

Intersection #: 9

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Branch Rd

Int. Street Name: Office Drwy

Description: Branch Rd
Intersection Approach (NB)



Description: Branch Rd
Intersection Approach (SB)



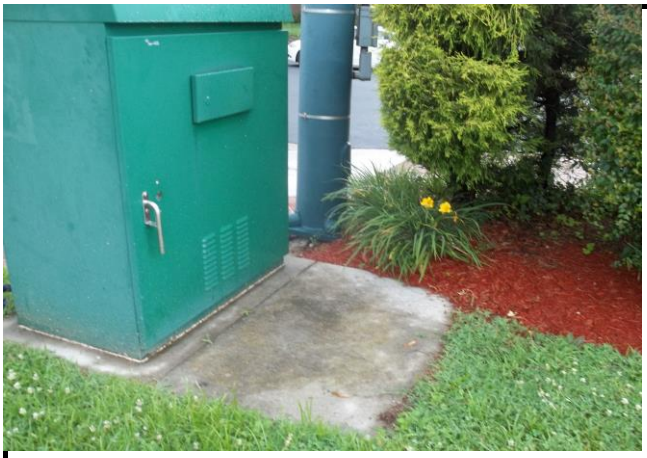
Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED)
and Police Access Panel



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 9

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Branch Rd

Int. Street Name: Office Drwy

Description: Police Access Panel



Description: Uninterruptible Power Supply Cabinet (Closed)

Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (Open)



Description: Queueing from Northbound Left at Beulah Rd. extending to Branch Road intersection increasing NB Right Turn delay



Description: Queueing from Northbound Left at Beulah Rd. extending to Branch Road intersection increasing NB Right Turn delay



Intersection 10

Route 123 (Maple Ave) and Beulah Rd





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 10

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Beulah Rd

Int. Street Name: Shopping Plaza Drwy

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Shopping Plaza Drwy	-	-
2 - Southbound	Beulah Rd	6669	25
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

The signal is not in compliance with the permit plan. The permit plan shows concurrent phasing NB & SB (Beulah Rd & Shopping Plaza Drwy) with all 3-section signal heads; however, each approach has one 3-section and one 4-section signal head and utilizes split phasing.

Primary Recommendations:

- Replace controller cabinet with McCain 352i ATC cabinet, riser, and attached Tesco battery backup system on existing foundation and either install new McCain ATC eX2 controller or existing McCain ATC eX controller with ITS Interface Module.
- Install 10 port Ethernet switch.
- Install underground single-mode fiber optic cable in existing underground conduit between this intersection and Maple Ave at East St.
- Install two junction boxes between this intersection and Maple Ave at East St to intercept fiber optic cable run and improve ease of pulling cable (Total run is 930', 2 junction boxes makes max pull 310').
- Replace existing Autoscope Terra video detection cameras with new Autoscope Vision video detection cameras.
- Replace existing push buttons with APS push buttons.
- Replace 3 existing pedestrian signals (SP-6) with new countdown pedestrian signals (SP-8) and new educational push button signs.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- None.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 10

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Beulah Rd

Int. Street Name: Shopping Plaza Drwy

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB			TOTAL	"X" All that Apply			
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of 2 VDOT Std. Mast Arms			
	12"							0		Signal Supports: VDOT Std. Strain Poles		
Vehicular Signal Qty (2-Section)	8"							0	Decorative Mast Arms			
	12"							0		Decorative Strain Pole		
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	2 Hand Hole on Pole (Yes or No)			
	12"	1	1	1	1			4		Date Tag on Pole (Yes or No)		
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	2 Pedestal			
	12"							0		Condition of Good Poor		
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	Signal Supports: Remarks: Painted green			
	12"							0		Dual mast arms		
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0	Strain Pole Bottom Present Not Present			
	12"	1	1					2		Tether Wire: Remarks: N/A		
Vehicular Signal Qty (4-Section FYA)	8"							0	Vehicular X Good Poor			
	12"							0		Signal Heads: Remarks: N/A		
Vehicular Signal Qty (5-Section)	8"							0	Pedestrian X Good Poor			
	12"			1	1			2		Signal Heads: Remarks: SW quad SB x-walk is SP-8		
"X" if Incandescent								-	Type & Number of 2 Strain Pole / Mast Arm			
"X" if LED		X	X	X	X			-		Push Button 2 Pedestal		
(Qty) of Opt Programmed								0	Supports: Stub Pole			
(Qty) of Visors		7	7	8	8			30		Remarks: N/A		
(Qty) of Backplates, Black								0	Preemption Emergency Vehicle			
(Qty) of Backplates, High Visibility		2	2	2	2			8		Purpose: Railroad		
(Qty) of Louvers								0	Transit			
(Qty) of Signal Strobes								0		Signing & PM: Remarks: All good		
Pedestrian Signal Qty	SP-5							0	Curb Ramp: Remarks: New where present			
	SP-6	0	1	0	2			3		Truncated Domes at all corners? Yes		
	SP-7							0			Misc. Equip.: Remarks: N/A	
	SP-8		1					1				"X" if Video Detectors X X X X
	SP-9							0				
"X" if Incandescent								-	"X" if Communication Ant.			
"X" if LED		X	X	X	X			-		Overhead Pole or Mast Arm Mounted Equipment		
(Qty) of Tunnel Visors		0	2	0	2			4			"X" if Confirmation Light	
(Qty) of Louvers								0				Damaged/Faded Sign Qty
Pedestrian Push Button Qty		0	2	0	2			4				
"X" if < 2 Inch Diameter Button								-	(Qty) of Internally Illuminated			
"X" if 2 Inch Diameter Button			X		X			-		(Qty) of LED Blank-Out Signs		
"X" if APS								-			(Qty) of Flashing Warning Signs	
Preemption								0				Faded Pav't Markings Qty
"X" if Optical												
"X" if Audible									"X" if Truncated Domes Present X X			
"X" if Radio										"X" if Radar Detectors		
"X" if GPS											"X" if Confirmation Light	
"X" if Confirmation Light												Damaged/Faded Sign Qty
Damaged/Faded Sign Qty								0				
(Qty) of Overhead St Name Signs								0	(Qty) of Internally Illuminated			
(Qty) of Internally Illuminated								0		(Qty) of LED Blank-Out Signs		
(Qty) of LED Blank-Out Signs								0			(Qty) of Flashing Warning Signs	
(Qty) of Flashing Warning Signs								0				Faded Pav't Markings Qty
Faded Pav't Markings Qty								0				
"X" if Curb Ramps Present			X		X				"X" if Truncated Domes Present X X			
"X" if Truncated Domes Present			X		X					"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty
									"X" if Truncated Domes Present X X			
										"X" if Radar Detectors		
											"X" if Confirmation Light	
												Damaged/Faded Sign Qty
									(Qty) of Internally Illuminated			
										(Qty) of LED Blank-Out Signs		
											(Qty) of Flashing Warning Signs	
												Faded Pav't Markings Qty



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 10

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Beulah Rd

Int. Street Name: Shopping Plaza Drwy

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

SE Location (Quadrant)
40% Capacity (% Full)
Good Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

X Underground
 Overhead
 w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-3 Type B (Underground) VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
 Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	9	PDC	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite Autoscope Terra	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, no date	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
No Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
No Does installation and operation conform with the permit plan?

Intersection #: 10

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Beulah Rd

Int. Street Name: Shopping Plaza Drwy

Description: Beulah Rd
Intersection Approach (NB)



Description: Beulah Rd
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED)
and Police Access Panel



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 10

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Beulah Rd

Int. Street Name: Shopping Plaza Drwy

Description: Police Access Panel (Open)



Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (Closed)



Description: Uninterruptible Power Supply Cabinet (Open)



Description: Existing Conduits for Traffic Signal Interconnect
(Underground) Running Shared in Signal Junction Box



Description: Existing Conduits for Traffic Signal Interconnect
(Underground) Running Shared in Signal Junction Box



Intersection 11

Route 123 (Maple Ave) and East St





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 11

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: East St

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	East St	-	25
2 - Southbound	East St	-	25
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

The signal is in compliance with the permit plan.

Primary Recommendations:

- Replace controller cabinet with McCain 352i ATC cabinet, riser, and attached Tesco battery backup system on existing foundation and either install new McCain ATC eX2 controller or existing McCain ATC eX controller with ITS Interface Module.
- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Maple Ave at Follin Ln.
- Replace existing Autoscope Terra video detection cameras with new Autoscope Vision video detection cameras.
- Replace existing pedestrian signals (SP-6) with new countdown pedestrian signals (SP-8) and new educational push button signs.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- Replace faded SB stop bar pavement marking.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 11

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: East St

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB			TOTAL	"X" All that Apply			
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of 4 VDOT Std. Mast Arms			
	12"							0		Signal Supports: VDOT Std. Strain Poles		
Vehicular Signal Qty (2-Section)	8"							0	Decorative Mast Arms			
	12"							0		Decorative Strain Pole		
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	4 Hand Hole on Pole (Yes or No)			
	12"	1	1	1	1			4		Date Tag on Pole (Yes or No)		
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	Pedestal			
	12"							0		Condition of X Good Poor		
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	Signal Supports: Remarks: Painted green			
	12"							0				
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0				
	12"							0		Strain Pole Bottom Present Not Present		
Vehicular Signal Qty (4-Section FYA)	8"							0	Tether Wire: Remarks: N/A			
	12"							0				
Vehicular Signal Qty (5-Section)	8"							0				
	12"	1	1	1	1			4				
"X" if Incandescent								-	Vehicular X Good Poor			
"X" if LED		X	X	X	X			-		Signal Heads: Remarks: EB green indications 25% burnt out		
(Qty) of Opt Programmed								0				
(Qty) of Visors		8	8	8	8			32				
(Qty) of Backplates, Black								0				
(Qty) of Backplates, High Visibility		2	2	2	2			8				
(Qty) of Louvers								0	Pedestrian X Good Poor			
(Qty) of Signal Strobes								0		Signal Heads: Remarks: N/A		
Pedestrian Signal Qty	SP-5							0	Type & Number of 6 Strain Pole / Mast Arm			
	SP-6	2	2	2	2			8		Push Button Pedestal		
	SP-7							0			Supports: 1 Stub Pole	
	SP-8							0				Remarks: N/A
	SP-9							0				
"X" if Incandescent								-	Purpose: Railroad			
"X" if LED		X	X	X	X			-		Transit		
(Qty) of Tunnel Visors								0			Signing & PM: Remarks: Faded stop bar SB	
(Qty) of Louvers		2	2	2	2			8				Curb Ramp: Remarks: Brick x-walks
Pedestrian Push Button Qty		2	2	2	2			8				
"X" if < 2 Inch Diameter Button								-	Truncated Domes at all corners? Yes			
"X" if 2 Inch Diameter Button		X	X	X	X			-		Misc. Equip.: Remarks: N/A		
"X" if APS		X	X	X	X			-				
Preemption								0				
"X" if Optical												
"X" if Audible												
"X" if Radio												
"X" if GPS												
"X" if Confirmation Light												
Damaged/Faded Sign Qty								0				
(Qty) of Overhead St Name Signs								0				
(Qty) of Internally Illuminated								0				
(Qty) of LED Blank-Out Signs								0				
(Qty) of Flashing Warning Signs								0				
Faded Pav't Markings Qty			22					22				
"X" if Curb Ramps Present		X	X	X	X							
"X" if Truncated Domes Present		X	X	X	X							
Overhead Pole or Mast Arm Mounted Equipment												
"X" if Video Detectors		X	X	X	X							
"X" if Radar Detectors												
"X" if Communication Ant.												



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 11

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: East St

Int. Street Name: -

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

SW Location (Quadrant)
40% Capacity (% Full)
Good Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

X Underground
 Overhead
 w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-3 Type B (Underground) VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
 Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	13	PDC	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite Autoscope Terra	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, date 6/17	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
Yes Does installation and operation conform with the permit plan?

Intersection #: 11

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: East St

Int. Street Name: -

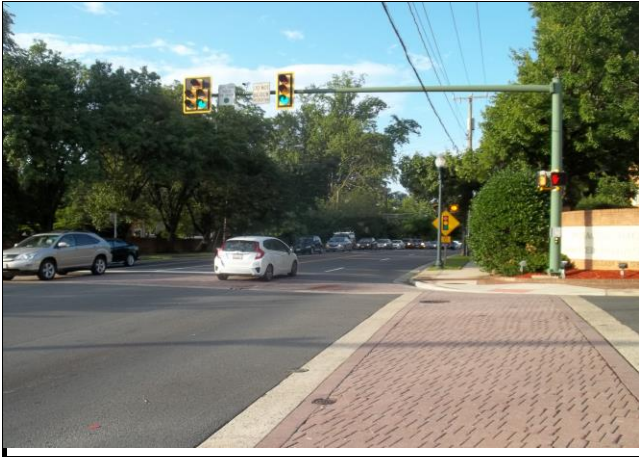
Description: East St
Intersection Approach (NB)



Description: East St
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (OPEN)



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 11

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: East St

Int. Street Name: -

Description: Police Access Panel



Description: Uninterruptible Power Supply (Closed)

Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply (Open)



Description: Accessible Pedestrian Signals (APS)



Description: Accessible Pedestrian Signals (APS)



Intersection 12

Route 123 (Maple Ave) and Follin Ln





Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Summary)

Date: 12/4/2018

Intersection #: 12

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Follin Ln

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/20/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Follin Ln	6927	25
2 - Southbound	Golf Course Drwy	-	-
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

No permit plan available.

Town of Vienna public works indicated that the mast arm in the NW quadrant and controller cabinet at this intersection were recently struck, and a temporary controller cabinet is currently in use.

During a follow up meeting on 11/7/2018, the Town of Vienna indicated that they had replaced the temporary controller cabinet with a permanent cabinet, and they were in the process of replacing the damaged mast arm in the NW quadrant.

Primary Recommendations:

- Rebuild the entire signal including new signal poles, mast arms, vehicular signal heads, pedestrian signal heads, APS push buttons, video detection, signs, conduit, junction boxes, and wiring except reuse the existing controller cabinet, battery back up system, and new mast arm in the NW quadrant.
- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Maple Ave at East St. Note the cost for this recommendation is included in the cost for the intersection of Maple Ave at East St.
- Install CCTV camera with PTZ capabilities.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- Replace faded WB crosswalk pavement markings.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 12

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Follin Ln

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB			TOTAL	"X" All that Apply			
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of 4 VDOT Std. Mast Arms			
	12"							0		Signal Supports: VDOT Std. Strain Poles		
Vehicular Signal Qty (2-Section)	8"							0	Decorative Mast Arms			
	12"							0		Decorative Strain Pole		
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	Hand Hole on Pole (Yes or No)			
	12"	2	2	2	2			8		Date Tag on Pole (Yes or No)		
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	Pedestal			
	12"			1	1			2		Condition of Good X Poor		
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	Signal Supports: Remarks: Painted green			
	12"							0		Pole NW quad struck/damaged		
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0	Strain Pole Bottom Present Not Present			
	12"							0		Tether Wire: Remarks: N/A		
Vehicular Signal Qty (4-Section FYA)	8"							0	Vehicular Good X Poor			
	12"							0		Signal Heads: Remarks: Mostly 1st gen LED		
Vehicular Signal Qty (5-Section)	8"							0	partially burnt out			
	12"							0		Pedestrian Good Poor		
"X" if Incandescent								-	Signal Heads: Remarks: N/A			
"X" if LED		X	X	X	X			-		Type & Number of Strain Pole / Mast Arm		
(Qty) of Opt Programmed								0	Push Button Pedestal			
(Qty) of Visors		6	6	9	9			30		Supports: Stub Pole		
(Qty) of Backplates, Black								0	Remarks: N/A			
(Qty) of Backplates, High Visibility								0		Preemption Emergency Vehicle		
(Qty) of Louvers								0	Purpose: Railroad			
(Qty) of Signal Strobes								0		Transit		
Pedestrian Signal Qty	SP-5							0	Signing & PM: Remarks: High visibility x-walks EB/WB/SB			
	SP-6							0		Faded x-walk WB		
	SP-7							0			Curb Ramp: Remarks: DWS where present.	
	SP-8							0				All good.
	SP-9							0				
"X" if Incandescent								-	Misc. Equip.: Remarks: CCTV camera NW quad			
"X" if LED								-				
(Qty) of Tunnel Visors								0				
(Qty) of Louvers								0				
Pedestrian Push Button Qty								0				
"X" if < 2 Inch Diameter Button								-				
"X" if 2 Inch Diameter Button								-				
"X" if APS								-				
Preemption								0				
"X" if Optical												
"X" if Audible												
"X" if Radio												
"X" if GPS												
"X" if Confirmation Light												
Damaged/Faded Sign Qty								0				
(Qty) of Overhead St Name Signs								0				
(Qty) of Internally Illuminated								0				
(Qty) of LED Blank-Out Signs								0				
(Qty) of Flashing Warning Signs								0				
Faded Pav't Markings Qty					100			100				
"X" if Curb Ramps Present		X	X	X	X							
"X" if Truncated Domes Present		X	X	X	X							
Overhead Pole or Mast Arm Mounted Equipment												
"X" if Video Detectors		X	X	X	X							
"X" if Radar Detectors												
"X" if Communication Ant.												



Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 12

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Follin Ln

Int. Street Name: -

Cabinet Type:

 NEMA
 Type 170
 Electromechanical
 Flasher
 X ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
 X Fully-Actuated

Type of Coordination:

 None
 X TBC w/o GPS
 TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

 X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

 NE Location (Quadrant)
 45% Capacity (% Full)
 Good Overall Condition (Good / Poor)
 N/A Bottom Condition (Rusted ?)
 N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
 CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

 Underground
 X Overhead
 w/ Meter
 No Rust Disconnect Enclosure
Condition (Rusted ?)
 SE-3 Type A (Overhead) VDOT Standard
(SE-1 thru SE-11)

Accessories

 X Police Access Panel
 X Manual Cord
 Generator Adaptor Kit
 UPS (Separate Cab.)
 UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX2	Shelf mtd.; temp controller cabinet
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Cabinet Monitor Unit / CMU	1	McCain 2212-HV	
Auxiliary Display Unit / ADU	1	McCain 2220	
Switch Pack / Flasher Unit HDSP / HDFU	9	(8) HDSP: McCain 2202-HV, (1) HDFU: McCain 2202-HV	
Isolator Card			
Serial Interface Unit / SIU	2	McCain 2218	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite autoscope vision	
Preemption Module			
UPS / Battery Backup			
GPS Unit / Clock			
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

 Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
 N/A Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
 N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
 N/A Does installation and operation conform with the permit plan?

Intersection #: 12

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Follin Ln

Int. Street Name: -

Description: Follin Ln
Intersection Approach (NB)



Description: Follin Ln
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED)
and Police Access Panel



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 12

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Follin Ln

Int. Street Name: -

Description: Cabinet Conduit Elbow



Description: Electrical Service Disconnect



Description: Police Access Panel



Description: Traffic Signal Cabinet (Open) with Cabinet Adapter Base



Description: Route 123 (Maple Ave) Intersection Approach (EB)
Signal Sight Distance



Description: Traffic Signal Pole Damaged (Vehicle Impact)
on Northwest Corner



Intersection 13

Beulah Rd and Church St





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 13

Corridor Name: Beulah Rd

Int. Street Name: Church St

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Beulah Rd	6669	25
2 - Southbound	Beulah Rd	6669	25
3 - Eastbound	Church St	6933	25
4 - Westbound	Church St	6933	25
5 -			
6 -			

Summary of Potential Scope:

No permit plan available.

Primary Recommendations:

- Replace controller cabinet with McCain 352i ATC cabinet, riser, and attached Tesco battery backup system on existing foundation and either install new McCain ATC eX2 controller or existing McCain ATC eX controller with ITS Interface Module.
- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Maple Ave at Beulah Rd.

Secondary Recommendations:

- Rebuild the entire signal including new signal poles, mast arms, vehicular signal heads, pedestrian signal heads, APS push buttons, SE quadrant curb ramp, signs, video detection, conduit, junction boxes, and wiring except reuse the new controller cabinet and battery back up system installed in the primary recommendations.
- Install electronic security lock on controller cabinet.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- Replace faded EB crosswalk pavement markings and WB faded arrow pavement markings.
- Relocate EB stop bar a minimum distance of 40' from vehicular signal heads (may require detector changes).



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 13

Corridor Name: Beulah Rd

Int. Street Name: Church St

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB			TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of Signal Supports: <u>1</u> VDOT Std. Mast Arms <u>1</u> VDOT Std. Strain Poles <u>1</u> Decorative Mast Arms <u>1</u> Wood Utility Pole <u>1</u> Hand Hole on Pole (Yes or No) <u>1</u> Date Tag on Pole (Yes or No) <u>1</u> Pedestal
	12"							0	
Vehicular Signal Qty (2-Section)	8"							0	Condition of <u>X</u> Good <u> </u> Poor Signal Supports: <u> </u> Remarks: Strain pole painted green <u> </u> Date tag painted over <u> </u> Paint chipping
	12"							0	
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	Strain Pole Bottom <u> </u> Present <u>X</u> Not Present Tether Wire: <u> </u> Remarks: N/A
	12"	2	2	2	2			8	
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	Vehicular <u>X</u> Good <u> </u> Poor Signal Heads: <u> </u> Remarks: EB heads not 40' from stop bar
	12"							0	
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	Pedestrian <u> </u> Good <u> </u> Poor Signal Heads: <u> </u> Remarks: N/A
	12"							0	
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0	Type & Number of <u> </u> Strain Pole / Mast Arm Push Button <u> </u> Pedestal Supports: <u> </u> Stub Pole <u> </u> Remarks: N/A
	12"							0	
Vehicular Signal Qty (4-Section FYA)	8"							0	Preemption <u> </u> Emergency Vehicle Purpose: <u> </u> Railroad <u> </u> Transit
	12"							0	
Vehicular Signal Qty (5-Section)	8"							0	Signing & PM: <u> </u> Remarks: High visibility x-walks EB/NB/SB <u> </u> Faded x-walk markings EB <u> </u> Faded arrow marking WB
	12"							0	
"X" if Incandescent		X	X	X	X			-	Curb Ramp: <u> </u> Remarks: All good where present <u> </u> SE quad curb ramp no DWS
"X" if LED								-	
(Qty) of Opt Programmed								0	Truncated Domes at all corners? <u> </u> No
(Qty) of Visors		6	6	6	6			24	
(Qty) of Backplates, Black		2	2	2	2			8	Misc. Equip.: <u> </u> Remarks: Microwave detection <u> </u> antenna/receiver on utility pole NE quad
(Qty) of Backplates, High Visibility								0	
(Qty) of Louvers								0	
(Qty) of Signal Strobes								0	
Pedestrian Signal Qty	SP-5							0	
	SP-6							0	
	SP-7							0	
	SP-8							0	
	SP-9							0	
"X" if Incandescent								-	
"X" if LED								-	
(Qty) of Tunnel Visors								0	
(Qty) of Louvers								0	
Pedestrian Push Button Qty								0	
"X" if < 2 Inch Diameter Button								-	
"X" if 2 Inch Diameter Button								-	
"X" if APS								-	
Preemption								0	
"X" if Optical									
"X" if Audible									
"X" if Radio									
"X" if GPS									
"X" if Confirmation Light									
Damaged/Faded Sign Qty								0	
(Qty) of Overhead St Name Signs								0	
(Qty) of Internally Illuminated								0	
(Qty) of LED Blank-Out Signs								0	
(Qty) of Flashing Warning Signs								0	
Faded Pav't Markings Qty				60				60	
"X" if Curb Ramps Present		X	X	X					
"X" if Truncated Domes Present			X	X					
Overhead Pole or Mast Arm Mounted Equipment									
"X" if Video Detectors									Misc. Equip.: <u> </u> Remarks: Microwave detection <u> </u> antenna/receiver on utility pole NE quad
"X" if Radar Detectors									
"X" if Communication Ant.									



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 13

Corridor Name: Beulah Rd

Int. Street Name: Church St

Int. Street Name: -

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
X Fully-Actuated

Type of Coordination:

 None
 TBC w/o GPS
X TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

NE Location (Quadrant)
40% Capacity (% Full)
Good Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
CF-1 VDOT Standard
 (CF-1, CF-3, CF-4)

Power Source

X Underground
 Overhead
 w/ Meter
Rusted Disconnect Enclosure
 Condition (Rusted ?)
SE-4 Type A (Overhead) VDOT Standard
 (SE-1 thru SE-11)

Accessories

X Police Access Panel
 Manual Cord
X Generator Adaptor Kit
 UPS (Separate Cab.)
X UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	5	PDC	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module			
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, no date	
GPS Unit / Clock	1	McCain	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: Magnetometer Detector Module	1	Trafficware Pods (pucks)	

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
N/A Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
N/A Does installation and operation conform with the permit plan?

Intersection #: 13

Corridor Name: Beulah Rd

Int. Street Name: Church St

Int. Street Name: -

Description: Beulah Rd
Intersection Approach (NB)



Description: Beulah Rd
Intersection Approach (SB)



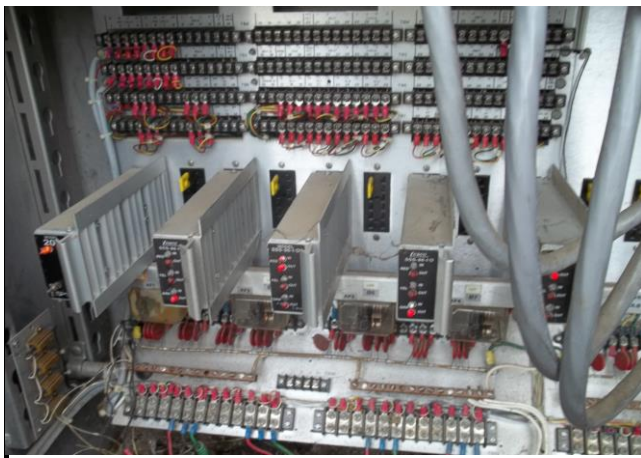
Description: Church St
Intersection Approach (EB)



Description: Church St
Intersection Approach (WB)



Description: Traffic Signal Cabinet (OPEN)



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 13

Corridor Name: Beulah Rd

Int. Street Name: Church St

Int. Street Name: -

Description: Police Access Panel



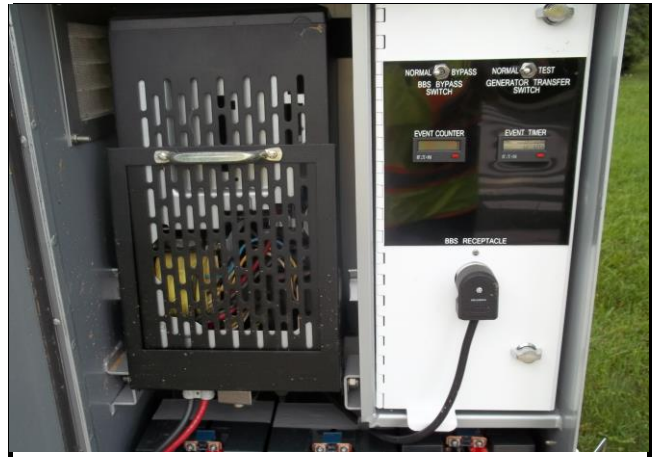
Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (Closed)



Description: Uninterruptible Power Supply Cabinet (Open)



Description: Shrubs and Earth Covering Existing Traffic Signal
Strain Pole Foundation, Baseplate and Anchor Bolts



Description: Queueing from Northbound Buelah Rd. Approach at Church
Extending to Buelah Rd. at Maple Ave (Rte. 123) Intersection



Intersection 14

Follin Ln and Echols St





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 14

Corridor Name: Follin Ln

Int. Street Name: Echols St

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Follin Ln	6927	25
2 - Southbound	Follin Ln	6927	25
3 - Eastbound	Echols St	2	25
4 - Westbound	Echols St	2	25
5 -			
6 -			

Summary of Potential Scope:

No permit plan available.

Primary Recommendations:

- None since this intersection is not included in the Smart Scale application.

Secondary Recommendations:

- Rebuild the entire signal including new signal poles, mast arms, controller cabinet, battery backup system, vehicular signal heads, pedestrian signal heads, APS push buttons, video detection, signs, conduit, junction boxes, and wiring.
- Install 10 port Ethernet switch.
- Install electronic security lock on controller cabinet.
- Install aerial single-mode fiber optic cable along existing utility poles and underground single-mode fiber optic cable in new buried conduit where necessary between this intersection and Maple Ave at Follin Ln.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.

Maintenance Recommendations:

- None.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 14

Corridor Name: Follin Ln

Int. Street Name: Echols St

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB			TOTAL	"X" All that Apply			
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of 2 VDOT Std. Mast Arms			
	12"							0		Signal Supports: VDOT Std. Strain Poles		
Vehicular Signal Qty (2-Section)	8"							0	Decorative Mast Arms			
	12"							0		Decorative Strain Pole		
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	2 Hand Hole on Pole (Yes or No)			
	12"	2	2	2	2			8		2 Date Tag on Pole (Yes or No)		
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	2 Pedestal			
	12"							0		Condition of X Good Poor		
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	Signal Supports: Remarks: Dual mast arms			
	12"							0		Painted green, tags painted over		
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0	Paint chipping			
	12"							0		Strain Pole Bottom Present Not Present		
Vehicular Signal Qty (4-Section FYA)	8"							0	Tether Wire: Remarks: N/A			
	12"							0		Vehicular X Good Poor		
"X" if Incandescent								-	Signal Heads: Remarks: N/A			
	"X" if LED	X	X	X	X			-		Pedestrian X Good Poor		
(Qty) of Opt Programmed								0	Signal Heads: Remarks: N/A			
(Qty) of Visors		6	6	6	6			24		Pedestrian X Good Poor		
(Qty) of Backplates, Black								0	Signal Heads: Remarks: N/A			
(Qty) of Backplates, High Visibility		2	2	2	2			8		Type & Number of 1 Strain Pole / Mast Arm		
(Qty) of Louvers								0	Push Button 3 Pedestal			
(Qty) of Signal Strobes								0		Supports: Stub Pole		
Pedestrian Signal Qty	SP-5							0	Remarks: N/A			
	SP-6							0		Preemption Emergency Vehicle		
	SP-7							0			Purpose: Railroad	
	SP-8	0	2	2	0			4				Transit
	SP-9							0				
"X" if Incandescent							-	Curb Ramp: Remarks: All good where present.				
"X" if LED		X	X	X	X		-		Truncated Domes at all corners? Yes			
(Qty) of Tunnel Visors							0			Misc. Equip.: Remarks: N/A		
(Qty) of Louvers							0					
Pedestrian Push Button Qty		0	2	2	0		4					
"X" if < 2 Inch Diameter Button							-					
"X" if 2 Inch Diameter Button			X	X			-					
"X" if APS			X	X			-					
Preemption							0					
"X" if Optical												
"X" if Audible												
"X" if Radio												
"X" if GPS												
"X" if Confirmation Light												
Damaged/Faded Sign Qty							0					
(Qty) of Overhead St Name Signs							0					
(Qty) of Internally Illuminated							0					
(Qty) of LED Blank-Out Signs							0					
(Qty) of Flashing Warning Signs							0					
Faded Pav't Markings Qty							0					
"X" if Curb Ramps Present			X	X								
"X" if Truncated Domes Present			X	X								
Overhead Pole or Mast Arm Mounted Equipment												
"X" if Video Detectors												
"X" if Radar Detectors												
"X" if Communication Ant.												



**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)**

Date: 12/4/2018

Intersection #: 14

Corridor Name: Follin Ln

Int. Street Name: Echols St

Int. Street Name: -

Cabinet Type:

X NEMA
Type 170
Electromechanical
Flasher
ATC

Type of Operation:

Pre-Timed
Semi-Actuated
X Fully-Actuated

Type of Coordination:

None
TBC w/o GPS
X TBC w/ GPS
Hardwire Twisted Pair
Fiber Optic Cable
Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
Permit Plan Present
Moisture Issues

Cabinet Details:

SE Location (Quadrant)
40% Capacity (% Full)
Poor Overall Condition (Good / Poor)
N/A Bottom Condition (Rusted ?)
N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

Type I (Base)
Type II (Pole)
Pedestal
CF-1 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

X Underground
Overhead
w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-3 Type B (Underground) VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
Manual Cord
X Generator Adaptor Kit
UPS (Separate Cab.)
UPS (Mounted to Sig. Cab.)
Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	Peek LMD 9200	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	Peek	
Load Switch / Switch Pack	7	PDC	
Loop Detector Amplifier	4	Sarasota	
Radar Detector Module			
Video Detector Module			
Preemption Module			
UPS / Battery Backup			
GPS Unit / Clock	1	Iota engineering ITS 50R	
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
N/A Does installation and operation conform with the permit plan?

Intersection #: 14

Corridor Name: Follin Ln

Int. Street Name: Echols St

Int. Street Name: -

Description: Follin Ln
Intersection Approach (NB)



Description: Follin Ln
Intersection Approach (SB)



Description: Echols St
Intersection Approach (EB)



Description: Echols St
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED)
and Police Access Panel



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 14

Corridor Name: Follin Ln

Int. Street Name: Echols St

Int. Street Name: -

Description: Police Access Panel



Description: Electrical Service Disconnect



Description: Traffic Signal Pole Foundation Damage and Soil Erosion



Description: Generator Power Transfer Switch



Description: Accessible Pedestrian Signals (APS)



Description: Accessible Pedestrian Signals (APS)



Intersection 15

Route 123 (Maple Ave) and Vienna Plaza HAWK Signal





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 15

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Vienna Plaza HAWK Signal

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/20/2018 (Updated on 9/20/2018)

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Vienna Plaza HAWK Signal	-	-
2 - Southbound	Vienna Plaza HAWK Signal	-	-
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

No permit plan available.

Primary Recommendations:

- Replace controller cabinet with McCain 356i ATC cabinet and either install new McCain ATC eX2 controller or existing McCain ATC eX controller with ITS Interface Module.
- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Maple Ave and Lawyers Rd/Courthouse Rd.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.

Maintenance Recommendations:

- None.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 15

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Vienna Plaza HAWK Signal

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB			TOTAL	"X" All that Apply			
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of 1 VDOT Std. Mast Arms			
	12"							0		Signal Supports: VDOT Std. Strain Poles		
Vehicular Signal Qty (2-Section)	8"							0	Decorative Mast Arms			
	12"							0		Decorative Strain Pole		
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	1 Hand Hole on Pole (Yes or No)			
	12"			2	2			4		1 Date Tag on Pole (Yes or No)		
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	1 Pedestal			
	12"							0		Condition of X Good Poor		
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	Signal Supports: Remarks: All new painted green			
	12"							0				
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0				
	12"							0		Strain Pole Bottom Present Not Present		
Vehicular Signal Qty (4-Section FYA)	8"							0	Tether Wire: Remarks: N/A			
	12"							0				
"X" if Incandescent								-	Vehicular X Good Poor			
"X" if LED				X	X			-		Signal Heads: Remarks: All new		
(Qty) of Opt Programmed								0				
(Qty) of Visors				6	6			12				
(Qty) of Backplates, Black								0				
(Qty) of Backplates, High Visibility				2	2			4				
(Qty) of Louvers								0	Pedestrian X Good Poor			
(Qty) of Signal Strobes								0		Signal Heads: Remarks: All new		
Pedestrian Signal Qty	SP-5							0	Type & Number of 1 Strain Pole / Mast Arm			
	SP-6							0		Push Button 1 Pedestal		
	SP-7							0			Supports: Stub Pole	
	SP-8	1	1					2				Remarks: All new
	SP-9							0				
"X" if Incandescent								-	Signing & PM: Remarks: Brick x-walk			
"X" if LED		X	X					-		Curb Ramp: Remarks: All new		
(Qty) of Tunnel Visors								0			Truncated Domes at all corners? Yes	
(Qty) of Louvers		1	1					2				Misc. Equip.: Remarks: N/A
Pedestrian Push Button Qty		1	1					2				
"X" if < 2 Inch Diameter Button								-				
"X" if 2 Inch Diameter Button		X	X					-				
"X" if APS		X	X					-				
Preemption								0				
"X" if Optical												
"X" if Audible												
"X" if Radio												
"X" if GPS												
"X" if Confirmation Light												
Damaged/Faded Sign Qty								0				
(Qty) of Overhead St Name Signs								0				
(Qty) of Internally Illuminated								0				
(Qty) of LED Blank-Out Signs								0				
(Qty) of Flashing Warning Signs								0				
Faded Pav't Markings Qty								0				
"X" if Curb Ramps Present		X	X									
"X" if Truncated Domes Present		X	X									
Overhead Pole or Mast Arm Mounted Equipment												
"X" if Video Detectors												
"X" if Radar Detectors												
"X" if Communication Ant.												



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 15

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Vienna Plaza HAWK Signal

Int. Street Name: -

Cabinet Type:

X NEMA
 Type 170
 Electromechanical
 Flasher
 ATC

Type of Operation:

 Pre-Timed
X Semi-Actuated
 Fully-Actuated

Type of Coordination:

X None
 TBC w/o GPS
 TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

X Filter Present
 Permit Plan Present
 Moisture Issues

Cabinet Details:

SE Location (Quadrant)
75% Capacity (% Full)
Good Overall Condition (Good / Poor)
No Rust Bottom Condition (Rusted ?)
No Rust Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
X Type II (Pole)
 Pedestal
 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

X Underground
 Overhead
X w/ Meter
No Rust Disconnect Enclosure
Condition (Rusted ?)
SE-3 Type B (Underground) VDOT Standard
(SE-1 thru SE-11)

Accessories

X Police Access Panel
 Manual Cord
 Generator Adaptor Kit
 UPS (Separate Cab.)
 UPS (Mounted to Sig. Cab.)
 Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU	1	EDI	
Load Switch / Switch Pack	5	Econolite	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module			
Preemption Module			
UPS / Battery Backup			
GPS Unit / Clock			
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

N/A Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
N/A Does installation and operation conform with the permit plan?

Intersection #: 15

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Vienna Plaza HAWK Signal

Int. Street Name: -

Description: Pedestrian Crosswalk
Intersection Approach (NB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Traffic Signal Cabinet (OPEN)



Description: Pedestrian Crosswalk
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 15

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Vienna Plaza HAWK Signal

Int. Street Name: -

Description: Police Access Panel



Description: Electrical Service Disconnect



Description: Accessible Pedestrian Signals (APS)



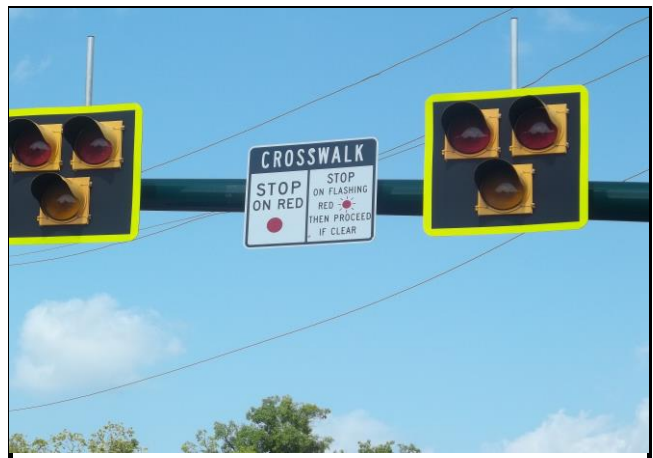
Description: Accessible Pedestrian Signals (APS)



Description: Accessible Pedestrian Signals (APS)



Description: Route 123 (Maple Ave)
Intersection Approach (EB) (New sign installed)



Intersection 16

Route 123 (Maple Ave) and James Madison Dr (Future HAWK Signal)





**Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Summary)**

Date: 12/4/2018

Intersection #: 16

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: James Madison Dr. (Future HAWK Signal)

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Nick Fleming

Inventory Date(s): 9/20/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	James Madison Dr. (HAWK Signal)	-	-
2 - Southbound	James Madison Dr. (HAWK Signal)	-	25
3 - Eastbound	Maple Ave	123	30
4 - Westbound	Maple Ave	123	30
5 -			
6 -			

Summary of Potential Scope:

No permit plan available.

Primary Recommendations:

- Install 10 port Ethernet switch.
- Install aerial single-mode fiber optic cable along existing utility poles between this intersection and Maple Ave and Nutley St.

Secondary Recommendations:

- Install electronic security lock on controller cabinet.

Maintenance Recommendations:

- None.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 16

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: James Madison Dr. (Future HAWK Signal)

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment		NB	SB	EB	WB			TOTAL	"X" All that Apply	
Vehicular Signal Qty (1-Section)	8"							0	Type & Number of 2 VDOT Std. Mast Arms	
	12"							0		Signal Supports: VDOT Std. Strain Poles
Vehicular Signal Qty (2-Section)	8"							0	Decorative Mast Arms	
	12"							0		Decorative Strain Pole
Vehicular Signal Qty (3-Section ALL SOLID)	8"							0	Hand Hole on Pole (Yes or No)	
	12"							0		Date Tag on Pole (Yes or No)
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"							0	Pedestal	
	12"							0		
Vehicular Signal Qty (3-Section ALL ARROWS)	8"							0	Condition of X Good Poor	
	12"							0		Signal Supports: Remarks: Signal Mast Arm pole
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"							0	Foundations installed. Signal Mast Arm poles have not been installed on foundations.	
	12"							0		
Vehicular Signal Qty (4-Section FYA)	8"							0	Strain Pole Bottom Present Not Present	
	12"							0		Tether Wire: Remarks: N/A
Vehicular Signal Qty (5-Section)	8"							0	Remarks: N/A	
	12"							0		
"X" if Incandescent								-	Vehicular Good Poor	
"X" if LED								-		Signal Heads: Remarks: Not yet installed.
(Qty) of Opt Programmed								0	Remarks: Not yet installed.	
(Qty) of Visors								0		
(Qty) of Backplates, Black								0	Pedestrian Good Poor	
(Qty) of Backplates, High Visibility								0		Signal Heads: Remarks: Not yet installed.
(Qty) of Louvers								0	Remarks: Not yet installed.	
(Qty) of Signal Strobes								0		
Pedestrian Signal Qty	SP-5							0	Type & Number of Strain Pole / Mast Arm	
	SP-6							0		Push Button Pedestal
	SP-7							0		Supports: Stub Pole
	SP-8							0		Remarks: Not yet installed.
	SP-9							0		
"X" if Incandescent								-	Preemption Emergency Vehicle	
"X" if LED								-		Purpose: Railroad
(Qty) of Tunnel Visors								0	Transit	
(Qty) of Louvers								0	Signing & PM: Remarks: High Visibility x-walk markings	
Pedestrian Push Button Qty								0		
"X" if < 2 Inch Diameter Button								-	Curb Ramp: Remarks: All new	
"X" if 2 Inch Diameter Button								-		
"X" if APS								-	Truncated Domes at all corners? Yes	
Preemption								0		
"X" if Optical									Misc. Equip.: Remarks: N/A	
"X" if Audible										
"X" if Radio										
"X" if GPS										
"X" if Confirmation Light										
Damaged/Faded Sign Qty								0		
(Qty) of Overhead St Name Signs								0		
(Qty) of Internally Illuminated								0		
(Qty) of LED Blank-Out Signs								0		
(Qty) of Flashing Warning Signs								0		
Faded Pav't Markings Qty								0		
"X" if Curb Ramps Present		X	X							
"X" if Truncated Domes Present		X	X							
Overhead Pole or Mast Arm Mounted Equipment										
"X" if Video Detectors									Misc. Equip.: Remarks: N/A	
"X" if Radar Detectors										
"X" if Communication Ant.										



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/4/2018

Intersection #: 16

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: James Madison Dr. (Future HAWK Signal)

Int. Street Name: -

Cabinet Type:

☐ NEMA
☐ Type 170
☐ Electromechanical
☐ Flasher
☐ ATC

Type of Operation:

☐ Pre-Timed
☐ Semi-Actuated
☐ Fully-Actuated

Type of Coordination:

☐ None
☐ TBC w/o GPS
☐ TBC w/ GPS
☐ Hardwire Twisted Pair
☐ Fiber Optic Cable
☐ Spread Spectrum Radio

Cabinet Maintenance:

☐ Filter Present
☐ Permit Plan Present
☐ Moisture Issues

Cabinet Details:

☐ Location (Quadrant)
☐ Capacity (% Full)
☐ Overall Condition (Good / Poor)
☐ Bottom Condition (Rusted ?)
☐ Boot / Conduit Elbow (Rusted ?)

Type of Mounting

☐ Type I (Base)
☐ Type II (Pole)
☐ Pedestal
☐ VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

☐ Underground
☐ Overhead
☐ w/ Meter
☐ Disconnect Enclosure
Condition (Rusted ?)
☐ VDOT Standard
(SE-1 thru SE-11)

Accessories

☐ Police Access Panel
☐ Manual Cord
☐ Generator Adaptor Kit
☐ UPS (Separate Cab.)
☐ UPS (Mounted to Sig. Cab.)
☐ Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller			
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Conflict Monitor / MMU			
Load Switch / Switch Pack			
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module			
Preemption Module			
UPS / Battery Backup			
GPS Unit / Clock			
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

N/A Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
N/A Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
N/A Does installation and operation conform with the permit plan?

Intersection #: 16

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: James Madison Dr. (Future HAWK Signal)

Int. Street Name: -

Description: Pedestrian Crosswalk
Intersection Approach (NB)



Description: Pedestrian Crosswalk
Intersection Approach (SB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Description: Route 123 (Maple Ave)
Intersection Approach (EB)



Description: Route 123 (Maple Ave)
Intersection Approach (WB)



Intersection #: 16

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: James Madison Dr. (Future HAWK Signal)

Int. Street Name: -

Description: Signal Mast Arm Pole Foundation South of Route 123
(Maple Ave) (EB approach signal foundation)



Description: Signal Mast Arm Pole Foundation South of Route 123
(Maple Ave) (EB approach signal foundation)



Description: Signal Mast Arm Pole Foundation North of Route 123
(Maple Ave) (WB approach signal foundation)



Description: Signal Mast Arm Pole Foundation North of Route 123
(Maple Ave) (WB approach signal foundation)



Description: _____

Description: _____



Intersection 17

Electric Ave and Navy Federal Credit Union Ent



Whitman, Requardt & Associates, LLP
Engineers · Architects · Environmental Planners Est. 1915



Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Summary)

Date: 12/20/2018

Intersection #: 17

Corridor Name: Electric Ave

Int. Street Name: Navy Federal Credit Union Ent

Int. Street Name: -

Signal Permit and Contact Information:

Consultant Observer(s): Dan Fritz & Nick Fleming

Inventory Date(s): 6/19/2018

Signal Permit #: _____

Municipality: Town of Vienna

Permit Approval Date: _____

County: Fairfax County

Latest Revision Date: _____

Primary Contact / Phone: Chad Charles / (P) 703-319-8603 / (C) 571-274-3373

Secondary Contact / Phone: Jeff Tufano / (P) 703-319-8606 / (C) 571-274-3374

Intersection Street Names and Numbers:

Approach	Street Name	Route #	Approach Speed Limit
1 - Northbound	Navy Federal Credit Union Ent	-	-
2 - Southbound	Navy Federal Credit Union Ent	-	15
3 - Eastbound	Electric Ave	1	25
4 - Westbound	Electric Ave	1	25
5 -			
6 -			

Summary of Potential Scope:

The signal is in compliance with the permit plan.

EB & WB Electric Ave left turn phases are prot/perm and lagging. They are not timed to come on together or terminate together; therefore, this creates a left turn trap situation. Town of Vienna indicated the left turn phasing was changed to lagging during construction. Recommend changing the left turn phases back to leading or programming to come on together and terminate together to eliminate the left turn trap. Another option is to replace EB & WB Electric Ave 5-section vehicular signal heads with 4-section flashing yellow arrow signals, install "Left Turn Yield On Flashing Yellow Arrow" sign, install additional EB & WB through movement 3-section head, and reprogram controller.

Primary Recommendations:

- None since this intersection is not included in the Smart Scale application.

Secondary Recommendations:

- Install 10 port Ethernet switch.
- Install electronic security lock on controller cabinet.
- Install APS pedestrian push buttons for all pedestrian crossings.
- Replace existing Autoscope Terra video detection cameras with new Autoscope Vision video detection cameras.
- Install optical/GPS (multimode) emergency vehicle preemption system on all approaches. This dual-system allows interoperability between optical (infrared) and GPS-enabled emergency vehicles.
- No communication is proposed at this intersection due to the distance away from the intersection of Follin Ln and Echols St (approx. 3,400'). In the future if additional traffic signals are installed along Follin Ln and Electric Ave, consideration should be given to installing either fiber optic cable or an Ethernet radio communication system.

Maintenance Recommendations:

- Install 3" retroreflective tape on all vehicular signal backplates.
- Replace existing 5-section vehicular signal heads EB & WB (Electric Ave.) with 4-section flashing yellow arrow signals, install "Left Turn Yield On Flashing Yellow Arrow" sign, install additional EB & WB through movement 3-section head, and reprogram controller.



Route 123 and Route 243 Traffic Signal Upgrades
Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/20/2018

Intersection #: 17

Corridor Name: Electric Ave

Int. Street Name: Navy Federal Credit Union Ent

Int. Street Name: -

General Signal Equipment Inventory:

Signal Equipment	NB	SB	EB	WB	___	___	TOTAL	"X" All that Apply
Vehicular Signal Qty (1-Section)	8"						0	Type & Number of 4 VDOT Std. Mast Arms
	12"						0	Signal Supports: VDOT Std. Strain Poles
Vehicular Signal Qty (2-Section)	8"						0	Decorative Mast Arms
	12"						0	Decorative Strain Pole
Vehicular Signal Qty (3-Section ALL SOLID)	8"						0	4 Hand Hole on Pole (Yes or No)
	12"	2	3	1	1		7	4 Date Tag on Pole (Yes or No)
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	8"						0	3 Pedestal
	12"						0	
Vehicular Signal Qty (3-Section ALL ARROWS)	8"						0	Condition of X Good ___ Poor
	12"						0	Signal Supports: Remarks: All new painted green
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	8"						0	
	12"						0	
Vehicular Signal Qty (4-Section FYA)	8"						0	Strain Pole Bottom ___ Present ___ Not Present
	12"						0	Tether Wire: Remarks: N/A
Vehicular Signal Qty (5-Section)	8"						0	
	12"			1	1		2	
"X" if Incandescent							-	
"X" if LED		X	X	X	X		-	
(Qty) of Opt Programmed							0	Vehicular X Good ___ Poor
(Qty) of Visors							0	Signal Heads: Remarks: All new
(Qty) of Backplates, Black		2	3	2	2		9	
(Qty) of Backplates, High Visibility							0	
(Qty) of Louvers							0	
(Qty) of Signal Strobes							0	Pedestrian X Good ___ Poor
Pedestrian Signal Qty	SP-5						0	Signal Heads: Remarks: All new
	SP-6						0	
	SP-7						0	
	SP-8						0	
	SP-9	0	2	2	2		6	Type & Number of 3 Strain Pole / Mast Arm
"X" if Incandescent							-	Push Button Pedestal
"X" if LED		X	X	X			-	Supports: 3 Stub Pole
(Qty) of Tunnel Visors		2	2	2			6	Remarks: All new
(Qty) of Louvers							0	
Pedestrian Push Button Qty		2	2	2			6	
"X" if < 2 Inch Diameter Button							-	
"X" if 2 Inch Diameter Button		X	X	X			-	Preemption ___ Emergency Vehicle
"X" if APS							-	Purpose: ___ Railroad
Preemption	0	0	0	0			0	___ Transit
"X" if Optical								
"X" if Audible								Signing & PM: Remarks: All new
"X" if Radio								High visibility x-walks
"X" if GPS								
"X" if Confirmation Light								
Damaged/Faded Sign Qty							0	
(Qty) of Overhead St Name Signs	1	1	1	1			4	Curb Ramp: Remarks: All new. Shared landings.
(Qty) of Internally Illuminated							0	
(Qty) of LED Blank-Out Signs							0	
(Qty) of Flashing Warning Signs							0	
Faded Pav't Markings Qty							0	
"X" if Curb Ramps Present		X	X	X				Truncated Domes at all corners? Yes
"X" if Truncated Domes Present		X	X	X				
Overhead Pole or Mast Arm Mounted Equipment								
"X" if Video Detectors	X	X	X	X				Misc. Equip.: Remarks: N/A
"X" if Radar Detectors								
"X" if Communication Ant.								



Route 123 and Route 243 Traffic Signal Upgrades Traffic Signal Equipment Inventory (Equipment Log)

Date: 12/20/2018

Intersection #: 17

Corridor Name: Electric Ave

Int. Street Name: Navy Federal Credit Union Ent

Int. Street Name: -

Cabinet Type:

 NEMA
 Type 170
 Electromechanical
 Flasher
 X ATC

Type of Operation:

 Pre-Timed
 Semi-Actuated
 X Fully-Actuated

Type of Coordination:

 X None
 TBC w/o GPS
 TBC w/ GPS
 Hardwire Twisted Pair
 Fiber Optic Cable
 Spread Spectrum Radio

Cabinet Maintenance:

 X Filter Present
 X Permit Plan Present
 Moisture Issues

Cabinet Details:

 NE Location (Quadrant)
 40% Capacity (% Full)
 Good Overall Condition (Good / Poor)
 N/A Bottom Condition (Rusted ?)
 N/A Boot / Conduit Elbow (Rusted ?)

Type of Mounting

 Type I (Base)
 Type II (Pole)
 Pedestal
 CF-3 VDOT Standard
(CF-1, CF-3, CF-4)

Power Source

 X Underground
 Overhead
 X w/ Meter
 No Rust Disconnect Enclosure
Condition (Rusted ?)
 SE-5 VDOT Standard
(SE-1 thru SE-11)

Accessories

 X Police Access Panel
 X Manual Cord
 X Generator Adaptor Kit
 UPS (Separate Cab.)
 X UPS (Mounted to Sig. Cab.)
 X Com Box

Cabinet Equipment Inventory

Equipment	Qty	Manufacturer / Model	Remarks (Rack, Shelf, Condition, Software Version, etc.)
Local Controller	1	McCain ATC eX2	Shelf mtd.
Master Controller			
Equipment	Qty	Remarks (Rack, Shelf, Condition, etc.)	
Cabinet Monitor Unit / CMU	1	McCain 2212-HV	
Auxiliary Display Unit / ADU	1	McCain 2220	
Switch Pack / Flasher Unit HDSP / HDFU	9	(8) HDSP: McCain 2202-HV, (1) HDFU: McCain 2202-HV	
Isolator Card	2	EDI 242L	
Serial Interface Unit / SIU	2	McCain 2218	
Loop Detector Amplifier			
Radar Detector Module			
Video Detector Module	1	Econolite Autoscope Terra	
Preemption Module			
UPS / Battery Backup	1	Tesco, 6 batteries, date 4/17	
GPS Unit / Clock			
Radio Transceiver			
Fiber Modem			
Phone Drop / Telephone Modem			
Interconnect			
Other: _____			

Operational and Permit Plan Checks ("Yes", "No", or "N/A")

 Yes Do all detectors / detector amplifiers work? (i.e. amplifier lights flash when vehicles detected).
 Yes Do all pedestrian push buttons work? (i.e. push each button and observe pedestrian signal call).
 N/A Are traffic signal communication modems plugged in? (i.e. cable plugged into modem and controller).
 Yes Does installation and operation conform with the permit plan?

Intersection #: 17

Corridor Name: Electric Ave

Int. Street Name: Navy Federal Credit Union Ent

Int. Street Name: -

Description: Navy Federal Credit Union Ent
Intersection Approach (NB)



Description: Navy Federal Credit Union Ent
Intersection Approach (SB)



Description: Electric Ave
Intersection Approach (EB)



Description: Electric Ave
Intersection Approach (WB)



Description: Traffic Signal Cabinet (CLOSED)



Description: Traffic Signal Cabinet (OPEN)



Intersection #: 17

Corridor Name: Electric Ave

Int. Street Name: Navy Federal Credit Union Ent

Int. Street Name: -

Description: Police Access Panel



Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (Closed)



Description: Uninterruptible Power Supply Cabinet (Open)



Description: Uninterruptible Power Supply Cabinet Generator Connection



Description: External Communications Interface Box



APPENDIX B

Detailed Cost Estimate Calculations



TOWN OF
VIENNA
since 1890





**Route 123 and Route 243 Traffic Signal Upgrades
Cost Estimate Summary**

Date: 12/20/2018

Project Summary:

Municipality: Town of Vienna

Number of Signals: 17

Primary Corridor(s): Route 123 (Maple Ave)
Route 243 (Nutley St)

Preliminary Cost Estimates:

Intersection	Cost	
	Primary Recommendations	Secondary Recommendations
1 - Nutley St @ Tapawingo Rd	\$350,000 ⁽¹⁾	\$19,622
2 - Nutley St @ Courthouse Rd	\$130,947	\$19,622
3 - Maple Ave @ Nutley St	\$92,090	\$24,995
4 - Maple Ave @ Courthouse Rd	\$68,470	\$19,622
5 - Maple Ave @ Center St	\$70,482 ⁽⁴⁾	\$19,622
6 - Maple Ave @ W&OD Trail	\$73,986	\$32,703
7 - Maple Ave @ Park St	\$21,239	\$19,622
8 - Maple Ave @ Glyndon St	\$104,481	\$24,294
9 - Maple Ave @ Branch Rd	\$78,879	\$16,819
10 - Maple Ave @ Beulah Rd	\$140,826	\$16,819
11 - Maple Ave @ East St	\$128,020	\$16,819
12 - Maple Ave @ Follin Ln	\$350,000 ⁽¹⁾	\$19,622
13 - Beulah Rd @ Church St	\$67,113	\$350,000 ⁽²⁾
14 - Follin Ln @ Echols St	\$0	\$375,000 ⁽³⁾
15 - Maple Ave @ Vienna Plaza HAWK Signal	\$58,174	\$934
16 - Maple Ave @ James Madison HAWK Signal	\$14,510	\$934
17 - Electric Ave @ NFCU Drwy	\$0	\$91,569
McCain Transparency Traffic Management System (TMS)	\$30,000	\$0
Total	\$1,779,219	\$1,082,616

(1) Cost represents complete signal replacement. These two complete signal replacements will be bid separately from the other primary recommendations.

(2) Cost represents complete signal replacement and is in addition to Primary Recommendations. Note cost is slightly higher to include potential overhead utility work.

(3) Cost represents complete signal replacement and is slightly higher to account for installation of fiber optic cable over a long distance.

(4) This cost includes installing aerial fiber optic cable to the Town Hall.



Route 123 and Route 243 Traffic Signal Upgrades
Cost Estimate - **Primary Recommendations**

Date: 12/20/2018

Traffic Signal Equipment Summary		Ave. Unit Cost (\$)	1 - Nutley St @ Tapawingo Rd	2 - Nutley St @ Courthouse Rd	3 - Maple Ave @ Nutley St	4 - Maple Ave @ Courthouse Rd	5 - Maple Ave @ Center St	6 - Maple Ave @ W&OD Trail	7 - Maple Ave @ Park St	8 - Maple Ave @ Glyndon St	9 - Maple Ave @ Branch Rd	10 - Maple Ave @ Beulah Rd	11 - Maple Ave @ East St	12 - Maple Ave @ Follin Ln	13 - Beulah Rd @ Church St	14 - Follin Ln @ Echols St	15 - Maple Ave @ Vienna Plaza HAWK Signal	16 - Maple Ave @ James Madison HAWK Signal	17 - Electric Ave @ NFCU Drwy	Total Quantity	Total Cost (\$)
Vehicular Signal Heads																					
Traf. Sig. Head Sec 12" HVS Backplate - EA		\$300																		0	\$0
Hanger Assembly SM-3, One-Way - EA		\$400																		0	\$0
Retrofit 12" Traf. Sig. Head - EA		\$125																		0	\$0
Backplate Modifications - EA		\$300																		0	\$0
Pedestrian Items																					
Countdown Pedestrian Signal Head (SP-8) - EA		\$700								8	4	3	8							23	\$16,100
Accessible Pedestrian Signals (APS) Push Buttons - EA		\$1,250.00						1		8	4	4								17	\$21,250
Sign Panel - SF		\$37.00								8	4	4	8							24	\$888
CG-12 Detectable Warning Surface - SY		\$350.00						6				4								6	\$2,100
Pedestrian Actuation (PA-2) - EA		\$250.00																		0	\$0
Pedestrian Actuation (PA-3) - EA		\$700.00																		0	\$0
Pedestrian Actuation (PA-4) - EA		\$1,000.00						1												1	\$1,000
Hanger Assembly SMB-3, One Way - EA		\$200.00																		0	\$0
Hanger Assembly SMB-3, Two Way - EA		\$400.00																		0	\$0
ADA Curb Ramp - EA		\$5,500.00																		0	\$0
Traffic Signal Equipment Cabinet																					
McCain 352i ATC Cabinet (On Existing Foundation) - EA		\$20,000.00		1				1		1	1	1	1		1					7	\$140,000
McCain 352i ATC Cabinet (On New CF-3 Foundation) - EA		\$22,500.00																		0	\$0
McCain 356i ATC Cabinet - EA		\$19,000.00															1			1	\$19,000
Controller Unit Only																					
Reinstall Existing McCain ATC Controller - EA		\$2,500.00		1				1		1	1	1	1		1		1			8	\$20,000
McCain ATC eX2 Controller - EA		\$5,000.00																		0	\$0
Cabinet Components																					
Uninterruptible Power Supply Type 2 (Tesco) - EA		\$3,750.00		1				1		1	1	1	1		1					7	\$26,250
Uninterruptible Power Supply Battery Pack (Tesco) - EA		\$450.00		1				1		1	1	1	1		1					7	\$3,150
Uninterruptible Power Supply Cabinet Attached (Tesco) - EA		\$3,100.00		1				1		1	1	1	1		1					7	\$21,700
Managed field Ethernet Switch Gbps - EA		\$3,000.00		1	1	1	1	1	1	1	1	1	1		1		1	1		13	\$39,000
Electronic Security Lock - EA		\$500.00																		0	\$0
Signing/Pavement Markings																					
Type B Class I Pave. Line Marking 24" - LF		\$8.00																		0	\$0
Type B Class I Pave. Line Marking 4" - LF		\$1.00																		0	\$0
Pvmt Symb Mrkg Sgl Turn Arrow Ty B, Cl I - EA		\$250.00																		0	\$0
Double Turn Arrow ThruLT or RT Type B, Cl I - EA		\$300.00																		0	\$0
Sign Panel - SF		\$37.00																		0	\$0
Blank-Out Sign Panel - EA		\$5,000.00																		0	\$0
Mast Arms																					
Repaint Existing Mast Arms - EA		\$3,500.00																		0	\$0
Signal Mast Arm Pole MP-3, Type A - EA		\$9,500.00																		0	\$0
Signal Mast Arm Pole MP-3, Type B1 - EA		\$10,500.00																		0	\$0
Signal Mast Arm Pole MP-3, Type B2 - EA		\$12,500.00																		0	\$0
Signal Mast Arm Pole MP-3, Type C - EA		\$11,000.00																		0	\$0
Mast Arm 30' - EA		\$2,750.00																		0	\$0
Mast Arm 40' - EA		\$3,250.00																		0	\$0
Mast Arm 49' - EA		\$4,000.00																		0	\$0
Mast Arm 60' - EA		\$6,000.00																		0	\$0
Mast Arm 65' - EA		\$6,500.00																		0	\$0
Mast Arm 70' - EA		\$7,750.00																		0	\$0
Mast Arm 75' Case 1 Loading - EA		\$8,250.00																		0	\$0
Mast Arm 75' Case 2 Loading - EA		\$9,250.00																		0	\$0
Test Bore - EA		\$1,900.00																		0	\$0
Concrete Foundation Signal Pole PF-8 - CY		\$1,150.00																		0	\$0
Pedestal Pole-PF-2 12' - EA		\$750.00																		0	\$0
Conc. Foundation PF-2 - EA		\$1,100.00																		0	\$0
Electrical Service																					
Electrical Service SE-3 Type A - EA		\$2,500.00																		0	\$0
Electrical Service SE-4 Type A - EA		\$2,500.00																		0	\$0
Miscellaneous																					
Video Detection Camera (Autoscope Vision) - EA		\$4,000.00		4	4	4	4					4	4							24	\$96,000
Video Detection System, (4 Video Inputs) (Autoscope Vision) - EA		\$12,000.00		1	1	1	1					1	1							6	\$72,000
Single-Mode Fiber Optic Cable 24 Strand - LF		\$7.00		1725	1750	1015	1175	575	860	950	450	1075	650		650		1125	725		12725	\$89,075
Optical/GPS EVP Detection System 2-way - EA		\$7,500.00																		0	\$0
Optical/GPS EVP Detection System 3-way - EA		\$9,500.00																		0	\$0
Optical/GPS EVP Detection System 4-way - EA		\$10,000.00																		0	\$0
CCTV Camera Digital - EA		\$5,500.00			1															1	\$5,500
Digital Video Encoder - EA		\$2,500.00			1															1	\$2,500
Reprogram Controller - LS		\$750.00																		0	\$0
Junction Box, JB-S1 - EA		\$1,250.00																		0	\$0
Junction Box, JB-S2 - EA		\$1,150.00																		0	\$0
Junction Box, JB-S3 - EA		\$1,400.00							2	2		2								6	\$8,400
5.8 GHZ Wireless Broadband Radio - EA		\$4,000.00																		0	\$0
Total Signal Equipment Cost (\$)			\$0	\$72,875	\$51,250	\$38,105	\$39,225	\$41,175	\$11,820	\$58,146	\$43,898	\$78,373	\$71,246	\$0	\$37,350	\$0	\$32,375	\$8,075	\$0		\$583,913
McCain Transparency TMS Software and Setup - Lump Sum (\$)			\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		\$30,000
MOT, Mobilization, Equipment Package, and Schedule 15%			\$0	\$10,931	\$7,688	\$5,716	\$5,884	\$6,176	\$1,773	\$8,722	\$6,585	\$11,756	\$10,687	\$0	\$5,603	\$0	\$4,856	\$1,211	\$0		\$87,587
SUBTOTAL - CONSTRUCTION			\$0	\$83,806	\$58,938	\$43,821	\$45,109	\$47,351	\$13,593	\$66,868	\$50,483	\$90,129	\$81,933	\$0	\$42,953	\$0	\$37,231	\$9,286	\$0		\$701,500
Contingency (\$) 25%			\$0	\$20,952	\$14,734	\$10,955	\$11,277	\$11,838	\$3,398	\$16,717	\$12,621	\$22,532	\$20,483	\$0	\$10,738	\$0	\$9,308	\$2,322	\$0		\$167,875
TOTAL - CONSTRUCTION BUDGET			\$280,000	\$104,758	\$73,672	\$54,776	\$56,386	\$59,189	\$16,991	\$83,585	\$63,103	\$112,661	\$102,416	\$280,000	\$53,691	\$0	\$46,539	\$11,608	\$0		\$1,429,375
Design (\$) 10%			\$28,000	\$10,476	\$7,367	\$5,478	\$5,639	\$5,919	\$1,699	\$8,358	\$6,310	\$11,266	\$10,242	\$28,000	\$5,369	\$0	\$4,654	\$1,161	\$0		\$139,937
Construction Management (\$) 15%			\$42,000	\$15,714	\$11,051	\$8,216	\$8,458	\$8,878	\$2,549	\$12,538	\$9,466	\$16,899	\$15,362	\$42,000	\$8,054	\$0	\$6,981	\$1,741	\$0		\$209,906
Grand Total (\$)			\$350,000	\$130,947	\$92,090	\$68,470	\$70,482	\$73,986	\$21,239	\$104,481	\$78,879	\$140,826	\$128,020	\$350,000	\$67,113	\$0	\$58,174	\$14,510	\$0		\$1,779,219



Route 123 and Route 243 Traffic Signal Upgrades Cost Estimate - **Secondary Recommendations**

Date: 12/20/2018

Traffic Signal Equipment Summary																					Total Quantity	Total Cost (\$)
Item / Category	Ave. Unit Cost (\$)	1 - Nutley St @ Tapawingo Rd	2 - Nutley St @ Courthouse Rd	3 - Maple Ave @ Nutley St	4 - Maple Ave @ Courthouse Rd	5 - Maple Ave @ Center St	6 - Maple Ave @ W&OD Trail	7 - Maple Ave @ Park St	8 - Maple Ave @ Glyndon St	9 - Maple Ave @ Branch Rd	10 - Maple Ave @ Beulah Rd	11 - Maple Ave @ East St	12 - Maple Ave @ Follin Ln	13 - Beulah Rd @ Church St	14 - Follin Ln @ Echols St	15 - Maple Ave @ Vienna Plaza HAWK Signal	16 - Maple Ave @ James Madison HAWK Signal	17 - Electric Ave @ NFCU Drwy				
Vehicular Signal Heads																						
Traf. Sig. Head Sec 12" HVS Backplate - EA	\$300																		0	\$0		
Hanger Assembly SM-3, One-Way - EA	\$400																		0	\$0		
Retrofit 12" Traf. Sig. Head - EA	\$125			3															3	\$375		
Backplate Modifications - EA	\$300																		0	\$0		
Pedestrian Items																						
Countdown Pedestrian Signal Head (SP-8) - EA	\$700																		0	\$0		
Accessible Pedestrian Signals (APS) Push Buttons - EA	\$1,250.00																	6	6	\$7,500		
Sign Panel - SF	\$37.00																		0	\$0		
CG-12 Detectable Warning Surface - SY	\$350.00																		0	\$0		
Pedestrian Actuation (PA-2) - EA	\$250.00																		0	\$0		
Pedestrian Actuation (PA-3) - EA	\$700.00																		0	\$0		
Pedestrian Actuation (PA-4) - EA	\$1,000.00																		0	\$0		
Hanger Assembly SMB-3, One Way - EA	\$200.00																		0	\$0		
Hanger Assembly SMB-3, Two Way - EA	\$400.00																		0	\$0		
ADA Curb Ramp - EA	\$5,500.00																		0	\$0		
Traffic Signal Equipment Cabinet																						
McCain 352i ATC Cabinet (On Existing Foundation) - EA	\$20,000.00																		0	\$0		
McCain 352i ATC Cabinet (On New CF-3 Foundation) - EA	\$22,500.00																		0	\$0		
McCain 356i ATC Cabinet - EA	\$19,000.00																		0	\$0		
Controller Unit Only																						
Reinstall Existing McCain ATC Controller - EA	\$2,500.00																		0	\$0		
McCain ATC eX2 Controller - EA	\$5,000.00																		0	\$0		
Cabinet Components																						
Uninterruptible Power Supply Type 2 (Tesco) - EA	\$3,750.00																		0	\$0		
Uninterruptible Power Supply Battery Pack (Tesco) - EA	\$450.00																		0	\$0		
Uninterruptible Power Supply Cabinet Attached (Tesco) - EA	\$3,100.00																		0	\$0		
Managed field Ethernet Switch Gbps - EA	\$3,000.00																	1	1	\$3,000		
Electronic Security Lock - EA	\$500.00	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	15	\$7,500		
Signing/Pavement Markings																						
Type B Class I Pave. Line Marking 24" - LF	\$8.00																		0	\$0		
Type B Class I Pave. Line Marking 4" - LF	\$1.00																		0	\$0		
Pvmt Symb Mrkg Sgl Turn Arrow Ty B, Cl I - EA	\$250.00																		0	\$0		
Double Turn Arrow Thru/LT or RT Type B, Cl I - EA	\$300.00																		0	\$0		
Sign Panel - SF	\$37.00																		0	\$0		
Blank-Out Sign Panel - EA	\$5,000.00																		0	\$0		
Mast Arms																						
Repaint Existing Mast Arms - EA	\$3,500.00						2												2	\$7,000		
Signal Mast Arm Pole MP-3, Type A - EA	\$9,500.00																		0	\$0		
Signal Mast Arm Pole MP-3, Type B1 - EA	\$10,500.00																		0	\$0		
Signal Mast Arm Pole MP-3, Type B2 - EA	\$12,500.00																		0	\$0		
Signal Mast Arm Pole MP-3, Type C - EA	\$11,000.00																		0	\$0		
Mast Arm 30' - EA	\$2,750.00																		0	\$0		
Mast Arm 40' - EA	\$3,250.00																		0	\$0		
Mast Arm 49' - EA	\$4,000.00																		0	\$0		
Mast Arm 60' - EA	\$6,000.00																		0	\$0		
Mast Arm 65' - EA	\$6,500.00																		0	\$0		
Mast Arm 70' - EA	\$7,750.00																		0	\$0		
Mast Arm 75' Case 1 Loading - EA	\$8,250.00																		0	\$0		
Mast Arm 75' Case 2 Loading - EA	\$9,250.00																		0	\$0		
Test Bore - EA	\$1,900.00																		0	\$0		
Concrete Foundation Signal Pole PF-8 - CY	\$1,150.00																		0	\$0		
Pedestal Pole-PF-2 12' - EA	\$750.00																		0	\$0		
Conc. Foundation PF-2 - EA	\$1,100.00																		0	\$0		
Electrical Service																						
Electrical Service SE-3 Type A - EA	\$2,500.00			1			1		1										3	\$7,500		
Electrical Service SE-4 Type A - EA	\$2,500.00																		0	\$0		
Miscellaneous																						
Video Detection Camera (Autoscope Vision) - EA	\$4,000.00																	4	4	\$16,000		
Video Detection System, (4 Video Inputs) (Autoscope Vision) - EA	\$12,000.00																	1	1	\$12,000		
Single-Mode Fiber Optic Cable 24 Strand - LF	\$7.00																		0	\$0		
Optical/GPS EVP Detection System 2-way - EA	\$7,500.00						1												1	\$7,500		
Optical/GPS EVP Detection System 3-way - EA	\$8,500.00									1	1	1	1						3	\$25,500		
Optical/GPS EVP Detection System 4-way - EA	\$10,000.00	1	1	1	1	1		1	1				1					1	9	\$90,000		
CCTV Camera Digital - EA	\$5,500.00																		0	\$0		
Digital Video Encoder - EA	\$2,500.00																		0	\$0		
Reprogram Controller - LS	\$750.00																		0	\$0		
Junction Box, JB-S1 - EA	\$1,250.00																		0	\$0		
Junction Box, JB-S2 - EA	\$1,150.00																		0	\$0		
Junction Box, JB-S3 - EA	\$1,400.00																		0	\$0		
5.8 GHZ Wireless Broadband Radio - EA	\$4,000.00																		0	\$0		
Total Signal Equipment Cost (\$)		\$10,500	\$10,500	\$13,375	\$10,500	\$10,500	\$17,500	\$10,500	\$13,000	\$9,000	\$9,000	\$9,000	\$10,500	\$0	\$0	\$500	\$500	\$49,000		\$183,875		
McCain Transparency TMS Software and Setup - Lump Sum (\$)		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0		\$0		
MOT, Mobilization, Equipment Package, and Schedule		15%	\$1,575	\$1,575	\$2,006	\$1,575	\$2,625	\$1,575	\$1,950	\$1,350	\$1,350	\$1,350	\$1,575	\$0	\$0	\$75	\$75	\$7,350		\$27,581		
SUBTOTAL - CONSTRUCTION			\$12,075	\$12,075	\$15,381	\$12,075	\$20,125	\$12,075	\$14,950	\$10,350	\$10,350	\$10,350	\$12,075	\$0	\$0	\$575	\$575	\$56,350		\$211,456		
Contingency (\$)		25%	\$3,019	\$3,019	\$3,845	\$3,019	\$5,031	\$3,019	\$3,738	\$2,588	\$2,588	\$2,588	\$3,019	\$0	\$0	\$144	\$144	\$14,088		\$52,864		
TOTAL - CONSTRUCTION BUDGET			\$15,094	\$15,094	\$19,227	\$15,094	\$25,156	\$15,094	\$18,688	\$12,938	\$12,938	\$12,938	\$15,094	\$280,000	\$288,460	\$719	\$719	\$70,438		\$832,780		
Design (\$)		15%	\$2,264	\$2,264	\$2,884	\$2,264	\$3,773	\$2,264	\$2,803	\$1,941	\$1,941	\$1,941	\$2,264	\$42,000	\$43,270	\$108	\$108	\$10,566		\$124,918		
Construction Management (\$)		15%	\$2,264	\$2,264	\$2,884	\$2,264	\$3,773	\$2,264	\$2,803	\$1,941	\$1,941	\$1,941	\$2,264	\$42,000	\$43,270	\$108	\$108	\$10,566		\$124,918		
Grand Total (\$)			\$19,622	\$19,622	\$24,995	\$19,622	\$32,703	\$19,622	\$24,294	\$16,819	\$16,819	\$16,819	\$19,622	\$364,000	\$375,000	\$934	\$934	\$91,569		\$1,082,616		



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