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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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

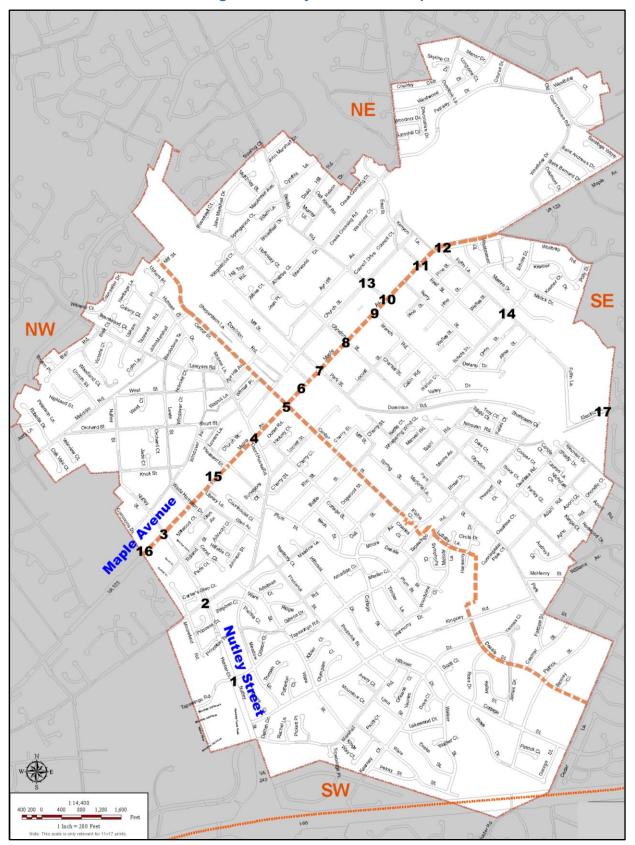


Figure 1: - Project Location Map

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
- o 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
- o 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 = \$1,082616

A summary of costs by intersection is provided in **Table 1** and the detailed cost estimate calculations are provided in **Appendix B**.

	Cost					
Intersection	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 @ NutleySt	\$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 Transparity Traffic Management System (TMS)	\$30,000	\$0				
Total	\$1,779,219	\$1,082,616				

Table 1: Cost Estimate Summary By Intersection

(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





since 1890

Intersection 1

Route 243 (Nutley St) and Tapawingo Rd





1

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Tapawingo Rd Int. Street Name: -

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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.



General Signal Equipment Inventory:

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

1

Intersection #:

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Tapawingo Rd

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL	L "X" All that Apply		
Vehicular Signal Qty	8"							0	Type & Number of	4 VDOT Std. M	ast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. S	train Poles
Vehicular Signal Qty	8″							0		Decorative M	ast Arms
(2-Section)	12"							0		Decorative St	train Pole
Vehicular Signal Qty	8"							0		4 Hand Hole or	Pole (Yes or No)
(3-Section ALL SOLID)	12"	2	2	2	2			8			Pole (Yes or No)
Vehicular Signal Qty	8"							0		Pedestal	. ,
(3-Sect, RED SOLID & 2 ARROWS)	12"							0			
Vehicular Signal Qty	8"							0	Condition of	Good	X Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: Painted greer	n chinning
Vehicular Signal Qty	8"							0	0 11	rionanie. Faintea green	i, empping
(4-Sect, 3 SOLID & 1 ARROW)	12"							0			
Vehicular Signal Qty	8"							0			
(4-Section FYA)	12"							0	Strain Pole Bottom	Present	Not Present
Vehicular Signal Qty	8"							0	Tether Wire:	Remarks: N/A	
(5-Section)	12"	1	1					2		Nomaria. IVA	
"X" if Incandescent			-					-			
"X" if LED		X	X	X	X			_			
(Qty) of Opt Programmed		~	~	~	~			0	Vehicular	X Good	Poor
(Qty) of Visors		11	11	6	6			34	Signal Heads:		
(Qty) of Backplates, Black			·····		·····			0	olghai ficaus.	Remarks: N/A	
(Qty) of Backplates, High V	licibility							0			
(Qty) of Louvers	isibility										
								0	Destantation	V Orad	Deer
(Qty) of Signal Strobes	00.5							0	Pedestrian	X Good	Poor
	SP-5							0	Signal Heads:	Remarks: N/A	
	SP-6							0			
Pedestrian Signal Qty	SP-7							0			
	SP-8	2	2	2	2			8			
	SP-9							0	Type & Number of	8 Strain Pole /	Mast Arm
"X" if Incandescent								-	Push Button	Pedestal	
"X" if LED		X	X	X	X			-	Supports:	Stub Pole	
(Qty) of Tunnel Visors								0		Remarks: N/A	
(Qty) of Louvers		2	2	2	2			8			
Pedestrian Push Button G	Qty	2	2	2	2			8			
"X" if < 2 Inch Diameter	Button							-			
"X" if 2 Inch Diameter B	utton	X	X	X	X			-	Preemption	Emergency V	ehicle
"X" if APS								-	Purpose:	Railroad	
Preemption								0		Transit	
"X" if Optical											
"X" if Audible									Signing & PM:	Remarks: High visibility	x-walks EB & WB
"X" if Radio											
"X" if GPS											
"X" if Confirmation Light											
Damaged/Faded Sign Qty								0			
(Qty) of Overhead St Nam	ne Signs							0	Curb Ramp:	Remarks: All new	
(Qty) of Internally Illumina	ted							0			
(Qty) of LED Blank-Out Si	gns							0			
(Qty) of Flashing Warning S	Signs							0			
Faded Pav't Markings Qty	,							0			
"X" if Curb Ramps Prese	nt	Х	Х	Х	Х				Truncated Domes a	at all corners?	Yes
"X" if Truncated Domes Pres	sent	Х	Х	Х	Х					—	
				Overhe	ad Pole	or Mas	t Arm N	lounted	Equipment		
"X" if Video Detectors		Х	Х	Х	Х				Misc. Equip.:	Remarks: N/A	
"X" if Radar Detectors											
"X" if Communication Ar	nt.										



	Intersec	tion #:		Corridor Name: Int. Street Name: Int. Street Name:	Tapawingo R)
Cabinet Ty	/pe:	<u>Type</u>	of Operation:	Type of Coo	rdination:		Cabinet Maintenance:
Х	NEMA		Pre-Timed	None			X Filter Present
			Semi-Actuated	TBC w	/o GPS		Permit Plan Present
	Electromechanical	Х	Fully-Actuated	X TBC w	/ GPS		Moisture Issues
	Flasher			Hardwi	ire Twisted Pair		
	_ATC			Fiber C	Optic Cable		
				Spread	Spectrum Rad	io	
Cabinet De	etails:						
NE	Location (Quadrant)		Type of Mounting	Power Source	•	Acces	sories
40%	Capacity (% Full)		Type I (Base)	X Underg	ground	Х	Police Access Panel
Good	_Overall Condition (Good / Poor)		Type II (Pole)	Overhe	ead		Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	w/ Met	er	Х	Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?)	CF-1 VDOT Standard	No Rust Discon	nect Enclosure		UPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Condit	ion (Rusted ?)	Х	UPS (Mounted to Sig. Cab.)
			SE-3 Type A (Ov <u>erhead)</u> VDOT (SE-1 t	Standard thru SE-11)		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)



Description: Tapawingo Rd Intersection Approach (EB)



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



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



Description: Tapawingo Rd

Intersection Approach (WB)



Description: Traffic Signal Cabinet (OPEN)





Intersection #: 1 Corridor Name: Route 243 (Nutley St) Int. Street Name: Tapawingo Rd

Int. Street Name: -

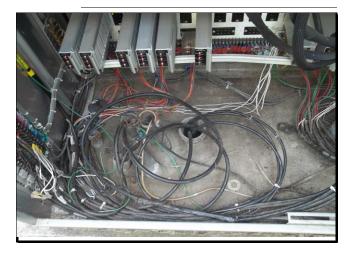
Description: Police Access Panel



Description: Uninterruptible Power Supply Cabinet (CLOSED)



Description: Traffic Signal Cabinet (OPEN)



Description: Electrical Service Disconnect



Uninterruptible Power Supply Cabinet (OPEN) Description:



Description:



Intersection 2

Route 243 (Nutley St) and Courthouse Rd





2

Intersection	#:

Corridor Name: Route 243 (Nutley St)

Int. Street Name:	Courthouse Rd
Int. Street Name:	-

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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.



General Signal Equipment Inventory:

2

Intersection #:

Corridor Name: Route 243 (Nutley St)

Int. Street Name: Courthouse Rd

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8″							0	Type & Number of	4 VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8″							0		Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8"							0		4 Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"	1	1	1	1			4		4 Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8"							0		4 Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"							0		
Vehicular Signal Qty	8"							0	Condition of	X Good Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: All new painted green
Vehicular Signal Qty	8"							0		All slightly discolored in spots
(4-Sect, 3 SOLID & 1 ARROW)	12"							0		
Vehicular Signal Qty	8"							0		
(4-Section FYA)	12"							0	Strain Pole Bottom	Present Not Present
Vehicular Signal Qty	8"							0	Tether Wire:	Remarks: N/A
(5-Section)	12"	1	1	1	1			4		Nomano. IVI
"X" if Incandescent								-		
"X" if LED		X	X	Х	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	orginal frondes.	Remarks. IVA
(Qty) of Backplates, High V	'isihilitv							0		
(Qty) of Louvers	isioiiity							0		
(Qty) of Signal Strobes								0	Pedestrian	X Good Poor
(Qly) of Signal Strobes	SP-5							0	Signal Heads:	
									Signal Heads:	Remarks: Ped head NE quad
Dedectrien Signal Oty	SP-6							0		NB x-walk upraised hand doesn't work
Pedestrian Signal Qty	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 G								0		
"X" if < 2 Inch Diameter								-		
"X" if 2 Inch Diameter B	utton	X	X	X	X			-	Preemption	Emergency Vehicle
"X" if APS		Х	Х	Х	Х			-	Purpose:	Railroad
Preemption								0		Transit
"X" if Optical										
"X" if Audible		ļ							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 Nam	•							0	Curb Ramp:	Remarks: All new.
(Qty) of Internally Illumina	ted							0		
(Qty) of LED Blank-Out Si	gns	ļ						0		
(Qty) of Flashing Warning S	Signs							0		
Faded Pav't Markings Qty	,							0		
"X" if Curb Ramps Prese	nt	Х	Х	Х	Х				Truncated Domes a	at all corners? Yes
"X" if Truncated Domes Pres	sent	Х	Х	Х	Х					
						or Mas	t Arm N	lounted	Equipment	
"X" if Video Detectors		X	X	X	X				Misc. Equip.:	Remarks: N/A
"X" if Radar Detectors										
"X" if Communication Ar	nt.									

•••	Intersec	tion #:	2	Corridor Name: Int. Street Name: Int. Street Name:)
Cabinet Ty	/pe:	<u>Type</u>	of Operation:	Type of Coo	rdination:		Cabinet Maintenance:
Х	NEMA		Pre-Timed	None			X Filter Present
	Type 170		Semi-Actuated	TBC w	/o GPS		Permit Plan Present
	Electromechanical	Х	Fully-Actuated	X TBC w	/ GPS		Moisture Issues
	Flasher			Hardwi	re Twisted Pair		
	ATC			Fiber C	ptic Cable		
				Spread	Spectrum Rad	io	
Cabinet De	etails:						
SW	Location (Quadrant)		Type of Mounting	Power Source		Acces	sories
40%	Capacity (% Full)		Type I (Base)	X Underg	round	Х	Police Access Panel
Good	Overall Condition (Good / Poor)	Type II (Pole)	Overhe	ad	Х	Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	X w/ Met	er	Х	Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted 3	?)	CF-1 VDOT Standard	No Rust Discon	nect Enclosure		UPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)	Х	UPS (Mounted to Sig. Cab.)
					Standard hru SE-11)		_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:
Int. Street Name:
-

Street Name:

Description: Route 243 (Nutley St)

Intersection Approach (NB)



Description: Courthouse Rd Intersection Approach (EB) Description: Route 243 (Nutley St)

Intersection Approach (SB)













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



Uninterruptible Power Supply Cabinet (OPEN) Description:

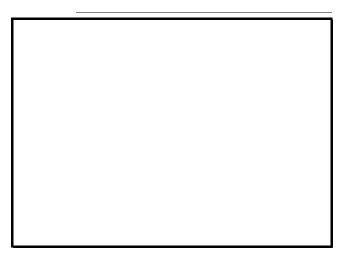
Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet



Description:





Description:



Intersection 3

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





3

Intersection	#:

Corridor Name: Route 123 (Maple Ave)

contaot Name.	
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.



3

Intersection #:

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Route 243 (Nutley St)

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8"							0	Type & Number of	VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8"							0		4 Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8"							0		4 Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"		2	2	2			6		Date Tag on Pole (Yes or No)
	8"	-	2	2	2			0		3 Pedestal
Vehicular Signal Qty (3-Sect, RED SOLID & 2 ARROWS)	0 12"									
· · · · ·	12 8"	2						2	Condition of	X Good Poor
Vehicular Signal Qty (3-Sect, 2 SOLID & G ARROW)										
	12" 8"		1					1	Signal Supports:	Remarks: Painted green
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)								0		
- · ·	12"							0		
Vehicular Signal Qty	8"							0		
(4-Sect, 2 SOLID & 2 ARROWS)	12"	1						1	Strain Pole Bottom	Present Not Present
Vehicular Signal Qty	8"							0	Tether Wire:	Remarks: N/A
(5-Section)	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		10	9	11	11			41	Signal Heads:	Remarks: N/A
(Qty) of Backplates, Black		3	3		3			9		
(Qty) of Backplates, High V	isibility			3				3		
(Qty) of Louvers								0		
(Qty) of Signal Strobes								0	Pedestrian	X Good Poor
	SP-5							0	Signal Heads:	Remarks: N/A
	SP-6							0		
Pedestrian Signal Qty	SP-7							0		
	SP-8	2	2	2	2			8		
	SP-9							0	Type & Number of	2 Strain Pole / Mast Arm
"X" if Incandescent								-	Push Button	6 Pedestal
"X" if LED		Х	Х	X	Х			-	Supports:	Stub Pole
(Qty) of Tunnel Visors								0		Remarks: Some push buttons emitting
(Qty) of Louvers		2	2	2	2			8		incorrect sound or no sound
Pedestrian Push Button Q	ty	2	2	2	2			8		during walk indication
"X" if < 2 Inch Diameter	Button							-		
"X" if 2 Inch Diameter B	utton	Х	Х	Х	Х			-	Preemption	Emergency Vehicle
"X" if APS		Х	Х	Х	Х			-	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 Nam		1	1	1	1			4	Curb Ramp:	Remarks: All new
(Qty) of Internally Illuminat	•							0	•	- Tomano, Fill Nov
(Qty) of LED Blank-Out Si								0		
(Qty) of Flashing Warning S	·····							0		
Faded Pav't Markings Qty	-							0		
"X" if Curb Ramps Prese		Х	Х	х	Х				Truncated Domes	at all corners? Yes
"X" if Truncated Domes Pres		X	X	X	X					
						or Mas	t Arm M	lounted	Equipment	
"X" if Video Detectors		Х	Х	Х	Х				Misc. Equip.:	Remarks: N/A
"X" if Radar Detectors							••••••		• •	
"X" if Communication Ar	nt.							·····		

General Signal Equipment Inventory:

	Intersec	tion #:		Corridor Name: Int. Street Name: Int. Street Name:	Route 243 (Nu		
Cabinet T	<u>ype:</u>	Type	of Operation:	Type of Coo	rdination:		Cabinet Maintenance:
Х	NEMA		Pre-Timed	None			X Filter Present
	Type 170		Semi-Actuated	TBC w	o GPS		Permit Plan Present
	Electromechanical	Х	Fully-Actuated	X TBC w	GPS		Moisture Issues
	Flasher			Hardwi	re Twisted Pair		
	ATC			Fiber C	ptic Cable		
				Spread	Spectrum Radi	io	
abinet D	Details:						
SE	Location (Quadrant)		Type of Mounting	Power Source		Acces	sories
40%	Capacity (% Full)		Type I (Base)	X Underg	round	х	Police Access Panel
Good	Overall Condition (Good / Poor)		Type II (Pole)	Overhe	ad		Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	w/ Met	ər	Х	Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?	ed ?) CF-1 VDOT Standard		No Rust Discon	nect Enclosure		UPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)	Х	UPS (Mounted to Sig. Cab.)
			SE-4 Type A (Ov <u>erhead)</u> VDOT (SE-1 t	Standard hru SE-11)		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	7
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 123 (Maple Ave) Intersection Approach (EB)

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



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



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



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: Police Access Panel

Description: Electrical Service Disconnect



Uninterruptible Power Supply Cabinet (OPEN) Description:



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





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.



General Signal Equipment Inventory:

4

Intersection #:

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Courthouse Rd

Int. Street Name: Lawyers Rd

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8″							0	Type & Number of	4 VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8″							0		Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8"							0		4 Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"	2	2	2	2			8		4 Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8″							0		3 Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"							0		
Vehicular Signal Qty	8"							0	Condition of	X Good Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: All new painted green
Vehicular Signal Qty	8"							0		
(4-Sect, 3 SOLID & 1 ARROW)	12"							0		
Vehicular Signal Qty	8"							0		
(4-Section FYA)	12"	1	1	1	1			4	Strain Pole Bottom	Present Not Present
Vehicular Signal Qty	8"							0	Tether Wire:	Remarks: N/A
(5-Section)	12"							0		
"X" if Incandescent								-		
"X" if LED		Х	X	Х	X			-		
(Qty) of Opt Programmed								0	Vehicular	X Good Poor
(Qty) of Visors		9	9	10	10			38	Signal Heads:	Remarks: All new
(Qty) of Backplates, Black		3	3	2	2			10		
(Qty) of Backplates, High V	lisibility	1	1	1	1			4		
(Qty) of Louvers								0		
(Qty) of Signal Strobes								0	Pedestrian	X Good Poor
	SP-5							0	Signal Heads:	Remarks: All new
	SP-6							0		
Pedestrian Signal Qty	SP-7							0		
	SP-8	2	2	2	2			8		
	SP-9							0	Type & Number of	2 Strain Pole / Mast Arm
"X" if Incandescent								-	Push Button	6 Pedestal
"X" if LED		Х	Х	Х	Х			-	Supports:	Stub Pole
(Qty) of Tunnel Visors								0		Remarks: Most push buttons emitting
(Qty) of Louvers		2	2	2	2			8		incorrect sound or no sound
Pedestrian Push Button G	Qty	2	2	2	2			8		during walk indication
"X" if < 2 Inch Diameter	Button							-		
"X" if 2 Inch Diameter B	utton	Х	X	Х	X			-	Preemption	Emergency Vehicle
"X" if APS		Х	X	Х	X			-	Purpose:	Railroad
Preemption								0		Transit
"X" if Optical										—
"X" if Audible									Signing & PM:	Remarks: Faded stop bar NB
"X" if Radio										Brick x-walks
"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		
"X" if Curb Ramps Present		Х	Х	Х	Х				Truncated Domes	at all corners? Yes
"X" if Truncated Domes Present		Х	Х	Х	Х					
				Overhe	ad Pole	or Mas	st Arm N	lounted	Equipment	
"X" if Video Detectors		Х	Х	Х	X		ļ	[]	Misc. Equip.:	Remarks: N/A
"X" if Radar Detectors										
"X" if Communication Ar	nt.									

	Intersec	tion #:	4	Corridor Name:	Route 123 (Ma	aple Av	e)
				Int. Street Name:	Courthouse R	Rd	
				Int. Street Name:	Lawyers Rd		
abinet Ty	/ <u>pe:</u>	Type (of Operation:	Type of Coo	rdination:		Cabinet Maintenance:
	NEMA		Pre-Timed	None			X Filter Present
	Туре 170		Semi-Actuated	TBC w	/o GPS		Permit Plan Present
	Electromechanical	Х	Fully-Actuated	X TBC w	GPS	Moisture Issues	
	Flasher			Hardwi	re Twisted Pair		
X ATC				Fiber C	Optic Cable		
				Spread	Spectrum Radi	io	
abinet De	etails:						
SE	Location (Quadrant)		Type of Mounting	Power Source	•	Acces	sories
55%	Capacity (% Full)		Type I (Base)	X Underg	round	Х	Police Access Panel
Good	Overall Condition (Good / Poor)		Type II (Pole)	Overhe	ad	Х	Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	X w/ Mete	er	Х	Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?)	CF-1 VDOT Standard	No Rust Discon			UPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)	Х	UPS (Mounted to Sig. Cab.)
			SE-3 Type B (Un	der <u>ground)</u> VDOT (SE-1 t	Standard hru SE-11)		_Com Box

Cabinet Equipment Inventory

WD

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

Courthouse Rd

Description:

Description: Courthouse Rd



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



iption: 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: Uninterruptible Power Supply Cabinet (OPEN)



Description: Accessible Pedestrian Signals (APS)



Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (OPEN)



Description: Accessible Pedestrian Signals (APS) (Damaged)



Intersection 5

Route 123 (Maple Ave) and Center St





Intersection #:	5	

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Center St Int. Street Name: -

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.



General Signal Equipment Inventory:

5

Intersection #:

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Center St

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8″							0	Type & Number of	4 VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8"							0		Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8"							0		4 Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"	1	1	1	1			4		4 Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8"							0		4 Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"							0		
Vehicular Signal Qty	8″							0	Condition of	X Good Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: All new painted green
Vehicular Signal Qty	8"							0		
(4-Sect, 3 SOLID & 1 ARROW)	12"							0		
Vehicular Signal Qty	8"							0		
(4-Section FYA)	12"							0	Strain Pole Bottom	Present Not Present
Vehicular Signal Qty	8"							0	Tether Wire:	Remarks: N/A
(5-Section)	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: All new
(Qty) of Backplates, Black		2	2	2	2			8		
(Qty) of Backplates, High V	isibility							0		
(Qty) of Louvers								0		
(Qty) of Signal Strobes								0	Pedestrian	X Good Poor
	SP-5							0	Signal Heads:	Remarks: All new
	SP-6							0		
Pedestrian Signal Qty	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: All new
(Qty) of Louvers	1417	2	2	2	2			8		
Pedestrian Push Button G "X" if < 2 Inch Diameter								0		
"X" if 2 Inch Diameter B		X	X	X	X			-	Preemption	Emergency Vehicle
"X" if APS	ution	×	X	X	X				Purpose:	Railroad
Preemption		~	X	~	~			0	Turpose.	Transit
"X" if Optical								<u> </u>		
"X" if Audible							<u> </u>		Signing & PM:	Remarks: All Good
"X" if Radio					l		<u> </u>			Brick x-walks
"X" if GPS										BIOLA WORKS
"X" if Confirmation Light										
Damaged/Faded Sign Qty								0		
(Qty) of Overhead St Nam								0	Curb Ramp:	Remarks: All new. Shared landings.
(Qty) of Internally Illumina	•							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		Х	Х	Х	Х				Truncated Domes a	at all corners? Yes
"X" if Truncated Domes Pres	sent	Х	Х	Х	Х					
				Overhe	ad Pole	e or Mas	st Arm N	lounted	Equipment	
"X" if Video Detectors		X	X	X	X		ļ		Misc. Equip.:	Remarks: N/A
"X" if Radar Detectors										
"X" if Communication Ar	nt.									

	Intersect	ion #:	5		me: Route 123 (Maple Ave)			
				Int. Street Name: Int. Street Name:				
Cabinet Ty	<u>vpe:</u>	Туре с	of Operation:	Type of Coo	rdination:		<u>Cabinet Maintenance:</u>	
	NEMA		Pre-Timed	None			X Filter Present	
	Туре 170		Semi-Actuated	TBC w	/o GPS		Permit Plan Present	
	Electromechanical	Х	Fully-Actuated	X TBC w	/ GPS		Moisture Issues	
	Flasher			Hardwi	re Twisted Pair			
Х	ATC			Fiber C	Optic Cable			
				Spread	Spectrum Radi	io		
Cabinet D	etails:							
SE	Location (Quadrant)		Type of Mounting	Power Source	•	Acces	sories	
40%	Capacity (% Full)		Type I (Base)	X Underg	ground	Х	Police Access Panel	
Good	Overall Condition (Good / Poor)		Type II (Pole)	Overhe	ead	Х	Manual Cord	
N/A	Bottom Condition (Rusted ?)		Pedestal	X w/ Met	er	Х	Generator Adaptor Kit	
N/A	Boot / Conduit Elbow (Rusted ?)		CF-1 VDOT Standard	No Rust Discon	nect Enclosure		UPS (Separate Cab.)	
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)	Х	UPS (Mounted to Sig. Cab.)	
			SE-3 Type B (Und	der <u>ground)</u> VDOT (SE-1 t	Standard hru SE-11)		_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	(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	7				
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

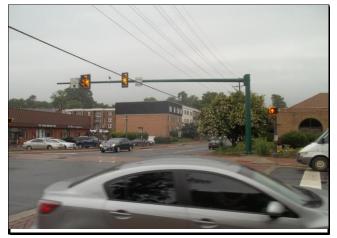
Corridor Name: Route 123 (Maple Ave) Int. Street Name: Center St

Int. Street Name: -

. otreet Name.

Description: Center St

Intersection Approach (NB)



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

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



Description: Center St

Intersection Approach (SB)



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



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



Electrical Service Meter Description:

Description: Electrical Service Disconnect



Description: Accessible Pedestrian Signals (APS)

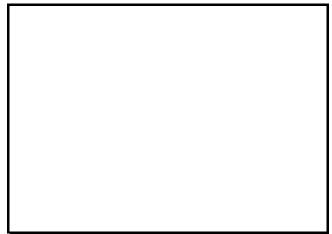


Description: Accessible Pedestrian Signals (APS)





Description:



Intersection 6

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





Intersection #: 6

Corridor Name: Route 123 (Maple Ave)

Int. Street Name:	Washington & Old Dominion Trail					
Int Street Name	-					

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.



General Signal Equipment Inventory:

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

6

Intersection #:

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Washington & Old Dominion Trail

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8″							0	Type & Number of	2 VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8"							0		Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8″							0		2 Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"			2	2			4		2 Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8″							0		Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"							0		
Vehicular Signal Qty	8″							0	Condition of	X Good Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: Painted green, chipping
Vehicular Signal Qty	8"							0	0 11	Some rust.
(4-Sect, 3 SOLID & 1 ARROW)	12"							0		
Vehicular Signal Qty	8"							0		
(4-Section FYA)	12"							0	Strain Pole Bottom	Present Not Present
Vehicular Signal Qty	8″							0	Tether Wire:	Remarks: N/A
(5-Section)	12"							0		
"X" if Incandescent								_		
"X" if LED				X	X			-		
(Qty) of Opt Programmed								0	Vehicular	X Good Poor
(Qty) of Visors				6	6			12	Signal Heads:	Remarks: N/A
(Qty) of Backplates, Black				·····	·····			0	e.g.a. neader	Nellians. IVA
(Qty) of Backplates, High V	'isihilitv			2	2			4		
(Qty) of Louvers	isioiiity			<u></u>	~					
(Qty) of Signal Strobes								0	Pedestrian	X Good Poor
	SP-5							0		
	·····								Signal Heads:	Remarks: N/A
Dedectries Signal Oty	SP-6							0		
Pedestrian Signal Qty	SP-7							0		
	SP-8	1	1					2		
	SP-9							0	Type & Number of	1 Strain Pole / Mast Arm
"X" if Incandescent								-	Push Button	1 Pedestal
"X" if LED		X	X					-	Supports:	Stub Pole
(Qty) of Tunnel Visors								0		Remarks: N/A
(Qty) of Louvers		1	1					2		
Pedestrian Push Button G		1	1					2		
"X" if < 2 Inch Diameter								-		
"X" if 2 Inch Diameter B	utton	X	X					-	Preemption	Emergency Vehicle
"X" if APS		Х	Х					-	Purpose:	Railroad
Preemption								0		Transit
"X" if Optical										
"X" if Audible		ļ							Signing & PM:	Remarks: Faded stopbars NB & SB
"X" if Radio										
"X" if GPS		ļ								
"X" if Confirmation Light										
Damaged/Faded Sign Qty								0		
(Qty) of Overhead St Nam								0	Curb Ramp:	Remarks: None present
(Qty) of Internally Illumina		ļ						0		
(Qty) of LED Blank-Out Si	gns	ļ						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? No
"X" if Truncated Domes Pres	sent									
				Overhe	ad Pole	e or Mas	t Arm M	lounted	Equipment	
"X" if Video Detectors									Misc. Equip.:	Remarks: N/A
"X" if Radar Detectors		_	.							
"X" if Communication Ar	1t.									

	Intersect	ion #:6		Route 123 (Maple Washington & Old		Trail
abinet T	<u>ype:</u>	Type of Operation:	<u>Type of Co</u>	ordination:	<u>Cabin</u>	et Maintenance:
Х	NEMA	Pre-Timed	None		Х	Filter Present
	Type 170	X Semi-Actuated	TBC	w/o GPS		Permit Plan Present
	Electromechanical	Fully-Actuated	X TBC	w/ GPS		Moisture Issues
	Flasher		Hard	wire Twisted Pair		
	ATC		Fiber	Optic Cable		
			Sprea	ad Spectrum Radio		
abinet D	Details:					
SW	Location (Quadrant)	Type of Mount	ing Power Source	e Ac	cessories	
35%	Capacity (% Full)	Type I (Base) Unde	rground	X Police	Access Panel
Poor	Overall Condition (Good / Poor)	Type II	(Pole) X Overl	nead	Manua	l Cord
N/A	Bottom Condition (Rusted ?)	Pedesta	alw/ Me	eter	X Genera	ator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?)) <u>CF-1</u> VDOT S	Standard <u>No Rust</u> Disco	nnect Enclosure	UPS (S	Separate Cab.)
		(CF-1, 0	CF-3, CF-4) Cond	ition (Rusted ?)	UPS (N	Mounted to Sig. Cab.)
		S	E-4 Type A (Ov <u>erhead)</u> VDO (SE-1	F Standard thru SE-11)	Com B	юх

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)



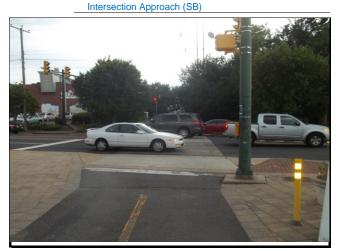
Description: Route 123 (Maple Ave) Intersection Approach (EB)



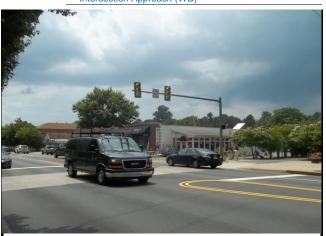
Description: Traffic Signal Cabinet (CLOSED) and Police Access Panel



Description: Washington & Old Dominion Trail



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



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)



Traffic Signal Cabinet Generator Connection Description: and GPS Clock Sensor



Description: Accessible Pedestrian Signals (APS)



Description: Electrical Service Disconnect



Accessible Pedestrian Signals (APS) Description:



Description:



Intersection 7

Route 123 (Maple Ave) and Park St





7

Intersection #	ersection #:	- 1

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.



General Signal Equipment Inventory:

Intersection #: 7

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Park St

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8″							0	Type & Number of	2 VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8"							0		Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8"							0		Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"	1	1	1	1			4		Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8"							0		2 Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"							0		
,	8"							0	Condition of	Good X Poor
Vehicular Signal Qty (3-Section ALL ARROWS)	12"					 		0	Signal Supports:	
, ,	12 8"							0	Signal Supports.	Remarks: Painted green, chipping
Vehicular Signal Qty (4-Sect, 3 SOLID & 1 ARROW)	·····.					<u> </u>				
	12"							0		
Vehicular Signal Qty	8"					.		0		
(4-Section FYA)	12"							0	Strain Pole Bottom	
Vehicular Signal Qty	8"					ļ		0	Tether Wire:	Remarks: N/A
(5-Section)	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 V	isibility							0		
(Qty) of Louvers								0		
(Qty) of Signal Strobes								0	Pedestrian	X Good Poor
	SP-5							0	Signal Heads:	Remarks: SW quad EB crossing
	SP-6	2	2	2	2			8		ped head defective
Pedestrian Signal Qty	SP-7							0		<u></u>
	SP-8					1		0		
	SP-9							0	Type & Number of	2 Strain Pole / Mast Arm
"X" if Incandescent								-	Push Button	2 Pedestal
"X" if LED		X	X	X	X			-	Supports:	Stub Pole
(Qty) of Tunnel Visors								0		Remarks: N/A
(Qty) of Louvers		2	2	2	2	<u> </u>		8		
Pedestrian Push Button G)tv	2	2	2	2			8		
"X" if < 2 Inch Diameter		_	_	_				-		
"X" if 2 Inch Diameter B		Х	X	X	X	<u> </u>			Preemption	Emergency Vehicle
"X" if APS		~	~	~		<u> </u>			Purpose:	Railroad
Preemption								0	i alpooo.	Transit
"X" if Optical								•		
"X" if Audible						<u> </u>	<u> </u>		Signing & PM:	Remarks: Brick x-walks
"X" if Radio									orgining of the	
"X" if GPS						<u> </u>				Faded stop bar NB & SB
						 				
"X" if Confirmation Light								0		
Damaged/Faded Sign Qty								0	Curb Barras	
(Qty) of Overhead St Name Signs									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 Prese		X	X	X	X				Truncated Domes	at all corners? Yes
"X" if Truncated Domes Pres	sent	Х	Х	Х	Х					
					· · · · · · · · · · · · · · · · · · ·	e or Mas	st Arm N	lounted	Equipment	
"X" if Video Detectors		X	X	X	X	ļ	ļ		Misc. Equip.:	Remarks: N/A
"X" if Radar Detectors						ļ	ļ			
"X" if Communication Ar	nt.									

	Intersec	tion #:7	Corridor Name: Route 12: Int. Street Name: Park St Int. Street Name: -	3 (Maple Ave)
abinet T	<u>ype:</u>	Type of Operation:	Type of Coordination:	<u>: Cabinet Maintenance:</u>
Х	NEMA	Pre-Timed	None	X Filter Present
	Type 170	Semi-Actuated	TBC w/o GPS	X Permit Plan Prese
	Electromechanical	X Fully-Actuated	X TBC w/ GPS	Moisture Issues
	Flasher		Hardwire Twisted	Pair
	ATC		Fiber Optic Cable	
			Spread Spectrum	Radio
abinet D	Details:			
SE	Location (Quadrant)	Type of Mounting	Power Source	Accessories
75%	Capacity (% Full)	Type I (Base)	Underground	X Police Access Panel
Poor	Overall Condition (Good / Poor)	Type II (Pole)	X Overhead	X Manual Cord
N/A	Bottom Condition (Rusted ?)	Pedestal	w/ Meter	X Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?) <u>CF-1</u> VDOT Standard	No Rust Disconnect Enclos	sure UPS (Separate Cab.)
		(CF-1, CF-3, CF-4	4) Condition (Rusted	UPS (Mounted to Sig. Cab
		SE-3 Type	A (Ov <u>erhead)</u> VDOT Standard (SE-1 thru SE-11)	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: Route 123 (Maple Ave) Intersection Approach (EB)



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



Description: Park St

Intersection Approach (SB)



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



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



Traffic Signal Cabinet Generator Adaptor Description:

Description: Electrical Service Disconnect



Pedestrian Signal, ADA compliance issues Description:



Description: Pedestrian Signal, ADA compliance issues





Description: Pedestrian Signal, ADA compliance issues



Intersection 8

Route 123 (Maple Ave) and Glyndon St





8

Intersection	# ·
Inter section	π.

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Glyndon St Int. Street Name: -

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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.



General Signal Equipment Inventory:

8

Intersection #:

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Glyndon St

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8"							0	Type & Number of	4 VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8″							0		Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8"							0		4 Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"	1	1	1	1			4		Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8"							0		Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"							0		
Vehicular Signal Qty	8"							0	Condition of	X Good Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: Painted green. Paint patch areas
Vehicular Signal Qty	8″							0		on all poles.
(4-Sect, 3 SOLID & 1 ARROW)	12"							0		
Vehicular Signal Qty	8"							0		
(4-Section FYA)	12"							0	Strain Pole Bottom	Present Not Present
Vehicular Signal Qty	8"	1	1	1	1			4	Tether Wire:	Remarks: N/A
(5-Section)	12"							0		
"X" if Incandescent								-		
"X" if LED		Х	Х	Х	Х			-		
(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								0	0	
(Qty) of Backplates, High V	isibilitv	2	2	2	2			8		
(Qty) of Louvers								0		
(Qty) of Signal Strobes								0	Pedestrian	X Good Poor
(all) of olghar of oboo	SP-5							0	Signal Heads:	Remarks: Not Countdown
	SP-6	2	2	2	2			8	olghai ficaus.	Remarks. Not Countdown
Pedestrian Signal Qty	SP-7	~	~	<u>~</u>	~			0		
recescian Signal Qty	SP-8							0		
	SP-0 SP-9								Tune 9 Number of	8 Strain Pole / Mast Arm
"X" if Incandescent	37-9							0	Type & Number of Push Button	Pedestal
"X" if LED		X	~	~	~			-		Stub Pole
(Qty) of Tunnel Visors		····^	Х	X	X			-	Supports:	
								0		Remarks: N/A
(Qty) of Louvers		2	2	2	2			8		
Pedestrian Push Button C		2	2	2	2			8		
"X" if < 2 Inch Diameter		~~~~	~	~~~~	~			-	Dreemation	
"X" if 2 Inch Diameter Bi "X" if APS	лиоп	X	Х	X	X			-	Preemption	Emergency Vehicle
-								-	Purpose:	Railroad
Preemption "X" if Optical								0		Transit
									Ciamina 9 DM	
"X" if Audible "X" if Radio						·····			Signing & PM:	Remarks: Brick x-walks
"X" if GPS										
"X" if Confirmation Light								0		
Damaged/Faded Sign Qty	o Signa							0	Curb Ramp:	Demostry Alleran Ota 11 1
(Qty) of Overhead St Name Signs								0	ourn Kallip:	Remarks: All new. Shared landings.
(Qty) of Internally Illuminated								0		4' Landing area behind type A
(Qty) of LED Blank-Out Signs										ramps not provided.
(Qty) of Flashing Warning Signs								0		
Faded Pav't Markings Qty		V	V	v	V			0	Truncated Domes	at all corners? Yes
"X" if Curb Ramps Prese "X" if Truncated Domes Pres		X X	X X	X	X X				muncated Domes a	
	benit	^	^			or Mas	t Arm N	lounted	Equipment	
"X" if Video Detectors		Х	Х	X		-or was		loamed	Misc. Equip.:	
"X" if Radar Detectors		^	^		^				moo. Equip	Remarks: N/A
"X" if Communication Ar	п.		[[

•••	Intersed	ction #:		Corridor Name: Int. Street Name: Int. Street Name:	Glyndon St	aple Ave)	
Cabinet T	уре:	Type	of Operation:	Type of Coo	rdination:	<u>(</u>	Cabinet Maintenance:
Х	NEMA		Pre-Timed	None			X Filter Present
	Туре 170		Semi-Actuated	TBC w	o GPS		Permit Plan Present
	Electromechanical	X	Fully-Actuated	X TBC w	GPS	_	Moisture Issues
	Flasher			Hardwi	re Twisted Pair		
	ATC			Fiber C	ptic Cable		
				Spread	Spectrum Radi	io	
Cabinet D	Details:						
SE	Location (Quadrant)		Type of Mounting	Power Source		Accesso	ories
50%	Capacity (% Full)		Type I (Base)	Underg	round	<u> </u>	Police Access Panel
Good	Overall Condition (Good / Pool	.)	Type II (Pole)	X Overhe	ad	N	Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	w/ Met	ər	X	Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted	ed ?) CF-1 VDOT Standard		No Rust Discon	nect Enclosure	i	JPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)	χι	JPS (Mounted to Sig. Cab.)
			SE-4 Type A (Ov <u>erhead)</u> VDOT (SE-1 t	Standard hru SE-11)	(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?



Intersection #: 8

Corridor Name: Route 123 (Maple Ave) Int. Street Name: Glyndon St

Int. Street Name: -

Description: Glyndon St

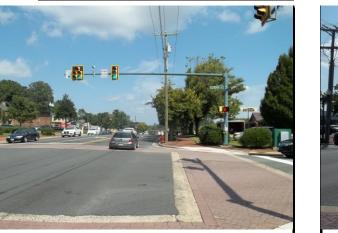
Intersection Approach (NB)



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 Approach (SB)



Intersection #: 8

Corridor Name: Route 123 (Maple Ave) Int. Street Name: Glyndon St

Int. Street Name: -

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Description: Police Access Panel
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Description: Uninterruptible Power Supply Cabinet (Closed)



Description: Traffic Signal Cabinet (OPEN)



Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (Open)



Description: Non-Countdown Pedestrian Signal



Intersection 9

Route 123 (Maple Ave) and Branch Rd





9

Intersection #:	
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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.



General Signal Equipment Inventory:

9

Intersection #:

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Branch Rd Int. Street Name: Office Drwy

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8″							0	Type & Number of	2 VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8"							0		Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8"							0		2 Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"	1	1	1	1			4		Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8"			-	-			0		2 Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"							0		
Vehicular Signal Qty	8"							0	Condition of	X Good Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: Painted green
Vehicular Signal Qty	8"							0	olgha oupporto.	· · · · · · · · · · · · · · · · · · ·
(4-Sect, 3 SOLID & 1 ARROW)	12"	1	1					2		Dual mast arms
	8"							0		
Vehicular Signal Qty (4-Section FYA)	12"							0	Strain Pole Bottom	Present Not Present
	8"							0	Tether Wire:	
Vehicular Signal Qty (5-Section)	12"			1	1			2	Tether wire:	Remarks: N/A
"X" if Incandescent	12			1	1			2		
"X" if LED		~	~	~	X					
		X	X	X	<u> </u>			-	Vahiaular	V Cood Door
(Qty) of Opt Programmed								0	Vehicular	X Good Poor
(Qty) of Visors		7	7	8	8			30	Signal Heads:	Remarks: N/A
(Qty) of Backplates, Black								0		
(Qty) of Backplates, High V	isibility	2	2	2	2			8		
(Qty) of Louvers								0		
(Qty) of Signal Strobes	1							0	Pedestrian	X Good Poor
	SP-5							0	Signal Heads:	Remarks: N/A
	SP-6	0	2	2	0			4		
Pedestrian Signal Qty	SP-7							0		
	SP-8							0		
	SP-9							0	Type & Number of	1 Strain Pole / Mast Arm
"X" if Incandescent								-	Push Button	3 Pedestal
"X" if LED			X	X				-	Supports:	Stub Pole
(Qty) of Tunnel Visors								0		Remarks: N/A
(Qty) of Louvers			2	2				4		
Pedestrian Push Button G	Qty		2	2				4		
"X" if < 2 Inch Diameter	Button							-		
"X" if 2 Inch Diameter B	utton		Х	Х				-	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
"X" if GPS										
"X" if Confirmation Light										
Damaged/Faded Sign Qty								0		
(Qty) of Overhead St Nam	ne Signs							0	Curb Ramp:	Remarks: All new. Shared landings.
(Qty) of Internally Illumina	ted							0		
(Qty) of LED Blank-Out Signs								0		
(Qty) of Flashing Warning Signs								0		
Faded Pav't Markings Qty		20						20		
"X" if Curb Ramps Prese			Х	Х					Truncated Domes	at all corners? Yes
"X" if Truncated Domes Pres			Х	Х						
				Overhe	ad Pole	or <u>Mas</u>	t Arm N	lounted	Equipment	
"X" if Video Detectors		Х	Х	Х	Х				Misc. Equip.:	Remarks: N/A
"X" if Radar Detectors										
"X" if Communication Ar	nt.									

	Intersect	tion #:		Corridor Name: Int. Street Name: Int. Street Name:	Branch Rd	aple Av	e)
Cabinet Ty	/pe:	Type o	of Operation:	Type of Coo	rdination:		Cabinet Maintenance:
Х	NEMA		Pre-Timed	None			X Filter Present
	Туре 170		Semi-Actuated	TBC w	/o GPS		Permit Plan Present
	Electromechanical	Х	Fully-Actuated	X TBC w	/ GPS		Moisture Issues
	Flasher			Hardwi	re Twisted Pair		
	_ATC			Fiber C	Optic Cable		
				Spread	Spectrum Radi	io	
Cabinet De	etails:						
SE	Location (Quadrant)		Type of Mounting	Power Source	•	Acces	sories
40%	Capacity (% Full)		Type I (Base)	X Underg	ground	Х	Police Access Panel
Good	_Overall Condition (Good / Poor)		Type II (Pole)	Overhe	ead		Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	w/ Met	er	Х	Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?))	CF-1 VDOT Standard	No Rust Discon	nect Enclosure		UPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)	Х	UPS (Mounted to Sig. Cab.)
			SE-3 Type B (Unc		Standard hru SE-11)		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?



9

Intersection #:

Corridor Name: Route 123 (Maple Ave) Int. Street Name: Branch Rd

Int. Street Name: Office Drwy

Description: Branch Rd

Intersection Approach (NB)



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



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

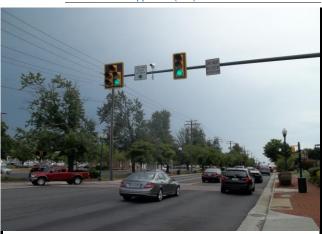


Description: Branch Rd

Intersection Approach (SB)



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



Description: Traffic Signal Cabinet (OPEN)





Intersection #: 9

Corridor Name:Route 123 (Maple Ave)Int. Street Name:Branch RdInt. Street Name:Office Drwy

Description: Police Access Panel



Description: Uninterruptible Power Supply Cabinet (Closed)

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



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



Intersection 10

Route 123 (Maple Ave) and Beulah Rd





10

Intersection #:

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
			Town of Vienne
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.



10

Intersection #:

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" A	II that Apply	
Vehicular Signal Qty	8"							0	Type & Number of	2	VDOT Std. M	Mast Arms
(1-Section)	12"							0	Signal Supports:		VDOT Std. 8	Strain Poles
Vehicular Signal Qty	8″							0			Decorative M	Aast Arms
(2-Section)	12"							0			Decorative S	Strain Pole
Vehicular Signal Qty	8"							0		2	Hand Hole o	n Pole (Yes or No)
(3-Section ALL SOLID)	12"	1	1	1	1			4			Date Tag on	Pole (Yes or No)
Vehicular Signal Qty	8"							0		2	Pedestal	
(3-Sect, RED SOLID & 2 ARROWS)	12"							0			_	
Vehicular Signal Qty	8"							0	Condition of		Good	Poor
(3-Section ALL ARROWS)	12"			<u> </u>				0	Signal Supports:	Romar	ks: Painted gree	
Vehicular Signal Qty	8"							0	3		ast arms	
(4-Sect, 3 SOLID & 1 ARROW)	12"	1	1					2		Duai III	031 01113	
Vehicular Signal Qty	8"							0				
(4-Section FYA)	12"			<u> </u>				0	Strain Pole Bottom		Present	Not Present
Vehicular Signal Qty	8"							0	Tether Wire:			
(5-Section)	12"			1	1			2	retiler wire.	Reman	ks: N/A	
"X" if Incandescent	12		-		1			-				
		~			~			-				
"X" if LED		X	X	X	X			-	Mahlandan	V	0	Dava
(Qty) of Opt Programmed		_						0	Vehicular	Х	Good	Poor
(Qty) of Visors		7	7	8	8			30	Signal Heads:	Remar	ks: N/A	
(Qty) of Backplates, Black								0				
(Qty) of Backplates, High V	isibility	2	2	2	2			8				
(Qty) of Louvers								0				
(Qty) of Signal Strobes								0	Pedestrian	Х	Good	Poor
	SP-5							0	Signal Heads:	Remar	ks: SW quad SE	3 x-walk is SP-8
	SP-6	0	1	0	2			3				
Pedestrian Signal Qty	SP-7							0				
	SP-8		1					1				
	SP-9							0	Type & Number of	2	Strain Pole /	Mast Arm
"X" if Incandescent								-	Push Button	2	Pedestal	
"X" if LED		Х	Х	X	Х			-	Supports:		Stub Pole	
(Qty) of Tunnel Visors		0	2	0	2			4		Remar	ks: N/A	
(Qty) of Louvers			Ι	Ι				0				
Pedestrian Push Button Q	ty	0	2	0	2			4				
"X" if < 2 Inch Diameter	Button							-				
"X" if 2 Inch Diameter B	ıtton		X		X				Preemption		Emergency	Vehicle
"X" if APS								-	Purpose:		Railroad	
Preemption								0			Transit	
"X" if Optical											_	
"X" if Audible			1	<u> </u>					Signing & PM:	Remar	ks: All good	
"X" if Radio			†	<u> </u>								<u> </u>
"X" if GPS			1	<u> </u>			·····	·····				<u> </u>
"X" if Confirmation Light				+								
Damaged/Faded Sign Qty								0				
			<u> </u>					0	Curb Ramp:	Pomer	ke: Now who	prosont
(Qty) of Overhead St Name Signs								0		Neman	ks: New where	0.00011
(Qty) of Internally Illuminated			+	<u> </u>				0				
(Qty) of LED Blank-Out Signs			+	<u> </u>				•••••				<u> </u>
(Qty) of Flashing Warning Signs								0				<u> </u>
Faded Pav't Markings Qty			V		V			U	Truncated Dames	ي الم ا		Voc
"X" if Curb Ramps Prese			X		X				Truncated Domes a	at all Co	uners?	Yes
"X" if Truncated Domes Pres	sent		Х	0	X				E			
				r		e or Mas	t Arm N	lounted	Equipment			
"X" if Video Detectors		X	X	X	X				Misc. Equip.:	Remar	ks: N/A	<u> </u>
"X" if Radar Detectors			ļ	ļ								
"X" if Communication Ar	nt.		1		1							

	Intersect		Corridor Name: Int. Street Name:		ple Ave)			
				Shopping Plaza Drwy				
binet Ty	/pe:	Type of Operation:	Type of Cool	rdination:	<u>c</u>	abinet Maintenance:		
Х	NEMA	Pre-Timed	None		_	X Filter Present		
		Semi-Actuated	TBC w/	o GPS	_	Permit Plan Present		
	Electromechanical	X Fully-Actuated	X TBC w/ GPS Hardwire Twisted Pair			Moisture Issues		
	Flasher							
	_ATC		Fiber C	ptic Cable				
			Spread	Spectrum Radio	c			
binet De	etails:							
SE	Location (Quadrant)	Type of Mounting	Power Source		Accessor	ries		
40%	Capacity (% Full)	Type I (Base)	X Underg	round	X P	olice Access Panel		
Good	Overall Condition (Good / Poor)	Type II (Pole)	Overhe	ad	M	anual Cord		
N/A	Bottom Condition (Rusted ?)	Pedestal	w/ Mete	er	<u> </u>	enerator Adaptor Kit		
N/A	Boot / Conduit Elbow (Rusted ?)	CF-1 VDOT Standard	No Rust Discon	nect Enclosure	U	PS (Separate Cab.)		
		(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)	<u> X </u> U	PS (Mounted to Sig. Cab.)		
		SE-3 Type B (Un	der <u>ground)</u> VDOT : (SE-1 ti	Standard hru SE-11)	C	om 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: Sciencing Place Draw

Int. Street Name: Shopping Plaza Drwy

Description: Beulah Rd

Intersection Approach (NB)



Description: Beulah Rd



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



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



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



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: Uninterruptible Power Supply Cabinet (Closed)



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



Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (Open)



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



Intersection 11

Route 123 (Maple Ave) and East St





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.



General Signal Equipment Inventory:

11

Intersection #:

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: East St

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL	"X" All that Apply		
Vehicular Signal Qty	8"							0	Type & Number of	4 VDOT Std. Mast Arms	
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles	
Vehicular Signal Qty	8"							0		Decorative Mast Arms	
(2-Section)	12"							0		Decorative Strain Pole	
Vehicular Signal Qty	8"							0		4 Hand Hole on Pole (Yes or No)	
(3-Section ALL SOLID)	12"	1	1	1	1			4		Date Tag on Pole (Yes or No)	
Vehicular Signal Qty	8"							0		Pedestal	
(3-Sect, RED SOLID & 2 ARROWS)	12"							0			
Vehicular Signal Qty	8"							0	Condition of	X Good Poor	
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: Painted green	
Vehicular Signal Qty	8"							0		Temarka. Fainted green	
(4-Sect, 3 SOLID & 1 ARROW)	12"							0			
Vehicular Signal Qty	8"							0			
(4-Section FYA)	12"							0	Strain Pole Bottom	Present Not Present	
Vehicular Signal Qty	8"							0	Tether Wire:	Remarks: N/A	
(5-Section)	12"	1	1	1	1			4		Nemarks. N/A	
"X" if Incandescent								-			
"X" if LED		X	Х	X	Х			-			
(Qty) of Opt Programmed			~	·····	·····			0	Vehicular	X Good Poor	
(Qty) of Visors		8	8	8	8			32	Signal Heads:	Remarks: EB green indications 25%	
(Qty) of Backplates, Black					Ň			0	olghai Houdo.	burnt out	
(Qty) of Backplates, High V	isihility	2	2	2	2			8		burnt out	
(Qty) of Louvers	isioiiity	~	~	<u> </u>	~			0			
(Qty) of Signal Strobes									Pedestrian	X Good Poor	
(Qly) of Signal Strobes	00.5							0			
	SP-5				<u> </u>			0	Signal Heads:	Remarks: N/A	
De de staiser Oisse et Otra	SP-6	2	2	2	2			8			
Pedestrian Signal Qty	SP-7							0			
	SP-8							0			
	SP-9							0	Type & Number of	6 Strain Pole / Mast Arm	
"X" if Incandescent								-	Push Button	Pedestal	
"X" if LED		X	X	X	X			-	Supports:	1 Stub Pole	
(Qty) of Tunnel Visors								0		Remarks: N/A	
(Qty) of Louvers		2	2	2	2			8			
Pedestrian Push Button G		2	2	2	2			8			
"X" if < 2 Inch Diameter								-			
"X" if 2 Inch Diameter B	utton	X	X	X	X			-	Preemption	Emergency Vehicle	
"X" if APS		Х	Х	Х	Х			-	Purpose:	Railroad	
Preemption								0		Transit	
"X" if Optical											
"X" if Audible							ļ		Signing & PM:	Remarks: Faded stop bar SB	
"X" if Radio							ļ				
"X" if GPS							ļ				
"X" if Confirmation Light											
Damaged/Faded Sign Qty								0			
(Qty) of Overhead St Nam	•							0	Curb Ramp:	Remarks: Brick x-walks	
(Qty) of Internally Illumina	ted						ļ	0		All new. Shared landings.	
(Qty) of LED Blank-Out Si	gns						ļ	0			
(Qty) of Flashing Warning Signs								0			
Faded Pav't Markings Qty			22					22			
"X" if Curb Ramps Present		Х	Х	Х	Х				Truncated Domes a	at all corners? Yes	
"X" if Truncated Domes Pres	sent	Х	Х	Х	Х						
				1		or Mas	st Arm N	lounted	Equipment		
"X" if Video Detectors		X	X	X	X				Misc. Equip.:	Remarks: N/A	
"X" if Radar Detectors											
"X" if Communication Ar	nt.										

	Intersec	tion #:		Corridor Name: Int. Street Name: Int. Street Name:	East St	aple Ave	e)	
abinet T	ype:	Type	of Operation:	Type of Cod	ordination:		Cabir	net Maintenance:
Х	NEMA		Pre-Timed	None			Х	Filter Present
	Туре 170		Semi-Actuated	TBC w	/o GPS			Permit Plan Present
	Electromechanical	Х	Fully-Actuated	X TBC w	// GPS			Moisture Issues
	Flasher			Hardw	ire Twisted Pair			
	ATC			Fiber 0	Optic Cable			
				Spread	d Spectrum Radi	io		
abinet D	etails:							
SW	Location (Quadrant)		Type of Mounting	Power Source	e	Acces	sories	
40%	Capacity (% Full)		Type I (Base)	X Underg	ground	Х	Police	Access Panel
Good	Overall Condition (Good / Poor)		Type II (Pole)	Overh	ead		Manua	al Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	w/ Met	er	Х	Genera	ator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?	sted ?) CF-1 VDOT Standard (CF-1, CF-3, CF-4		No Rust Discor	nect Enclosure		UPS (S	Separate Cab.)
				Condit	lition (Rusted ?)		UPS (Mounted to Sig. Cab.)	
			SE-3 Type B (Und	der <u>ground)</u> VDOT (SE-1	Standard thru SE-11)		Com B	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: -
- Int. Street Name:

Description: East St

Intersection Approach (NB)



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

Description: Traffic Signal Cabinet (OPEN)



Intersection Approach (SB)



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



Description: Traffic Signal Cabinet (OPEN)







Intersection #: 11

Corridor Name: Route 123 (Maple Ave) Int. Street Name: East St

Int. Street Name: -

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Description: Police Access Panel
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Description: Uninterruptible Power Supply (Closed)



Description: Accessible Pedestrian Signals (APS)



Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply (Open)



Description: Accessible Pedestrian Signals (APS)



Intersection 12

Route 123 (Maple Ave) and Follin Ln





12

Intersection	#:

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.



General Signal Equipment Inventory:

12

Intersection #:

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Follin Ln

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8″							0	Type & Number of	4 VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8"							0		Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8″							0		Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"	2	2	2	2			8		Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8"							0		Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"			1	1			2		
Vehicular Signal Qty	8"							0	Condition of	Good X Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: Painted green
Vehicular Signal Qty	8"							0		Pole NW quad struck/damaged
(4-Sect, 3 SOLID & 1 ARROW)	12"							0		
Vehicular Signal Qty	8"							0		
(4-Section FYA)	12"							0	Strain Pole Bottom	
Vehicular Signal Qty (5-Section)	8" 12"							0	Tether Wire:	Remarks: N/A
"X" if Incandescent								-		
"X" if LED		X	X	X	X			-		
(Qty) of Opt Programmed								0	Vehicular	Good X Poor
(Qty) of Visors		6	6	9	9			30	Signal Heads:	Remarks: Mostly 1st gen LED
(Qty) of Backplates, Black								0		partially burnt out
(Qty) of Backplates, High V	'isibility							0		
(Qty) of Louvers								0		
(Qty) of Signal Strobes								0	Pedestrian	Good Poor
	SP-5							0	Signal Heads:	Remarks: N/A
	SP-6							0		
Pedestrian Signal Qty	SP-7							0		
	SP-8							0		
	SP-9							0	Type & Number of	Strain Pole / Mast Arm
"X" if Incandescent								-	Push Button	Pedestal
"X" if LED								-	Supports:	Stub Pole
(Qty) of Tunnel Visors								0		Remarks: N/A
(Qty) of Louvers								0		
Pedestrian Push Button G	Qty							0		
"X" if < 2 Inch Diameter	Button							-		
"X" if 2 Inch Diameter B	utton							-	Preemption	Emergency Vehicle
"X" if APS								-	Purpose:	Railroad
Preemption								0		Transit
"X" if Optical										
"X" if Audible							 		Signing & PM:	Remarks: High visibility x-walks EB/WB/SB
"X" if Radio		ļ				 				Faded x-walk WB
"X" if GPS		ļ			ļ	 	ļ			
"X" if Confirmation Light										
Damaged/Faded Sign Qty								0		
(Qty) of Overhead St Nam								0	Curb Ramp:	Remarks: DWS where present.
(Qty) of Internally Illumina		ļ				ļ	ļ	0		All good.
(Qty) of LED Blank-Out Si	<u> </u>	ļ				ļ		0		
(Qty) of Flashing Warning S	-				400			0		
Faded Pav't Markings Qty			N/		100			100	Turner 1 D	
"X" if Curb Ramps Prese	nt		Х	Х	X				Truncated Domes a	at all corners? Yes
"X" if Truncated Domes Pre										
	sent		Х	X	X ad Pole	or Mor	+ Aruss	loupted	Equipmont	
IVII # Vist D-11	sent	X		Overhe	ad Pole	e or Mas	st Arm N	lounted	Equipment	
"X" if Video Detectors "X" if Radar Detectors	sent	X	X X			e or Mas	at Arm N	lounted	Equipment Misc. Equip.:	Remarks: CCTV camera NW quad

	Intersec	tion #:		Corridor Name: Int. Street Name: Int. Street Name:	Follin Ln	aple Ave	e)
Cabinet Ty	<u>vpe:</u>	Type	of Operation:	Type of Coo	rdination:		Cabinet Maintenance:
	NEMA		Pre-Timed	None			X Filter Present
	Type 170		Semi-Actuated	X TBC w	/o GPS		Permit Plan Present
	Electromechanical	Х	Fully-Actuated	TBC w	/ GPS		Moisture Issues
	Flasher			Hardwi	re Twisted Pair		
Х	ATC			Fiber C	Optic Cable		
				Spread	Spectrum Rad	io	
abinet D	etails:						
NE	Location (Quadrant)		Type of Mounting	Power Source		Acces	sories
45%	Capacity (% Full)		Type I (Base)	Underg	round	Х	Police Access Panel
Good	Overall Condition (Good / Poor)	Type II (Pole)	X Overhe	ad	Х	Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	w/ Met	er		Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?	usted ?) CF-1 VDOT Standard		No Rust Disconnect Encl			UPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)		UPS (Mounted to Sig. Cab.)
			SE-3 Type A (Ov <u>erhead)</u> VDOT (SE-1 t	Standard hru SE-11)		_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: Route 123 (Maple Ave)



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



Description: Follin Ln

Intersection Approach (SB)



Route 123 (Maple Ave) Intersection Approach (WB)



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: Police Access Panel

Description: Electrical Service Disconnect



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





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
		No. of the other	Town of Vienna
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).



General Signal Equipment Inventory:

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

13

Intersection #:

Corridor Name: Beulah Rd

Int. Street Name: Church St Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8"							0	Type & Number of	VDOT Std. Mast Arms
(1-Section)	12"			1				0	Signal Supports:	1 VDOT Std. Strain Poles
Vehicular Signal Qty	8″							0		Decorative Mast Arms
(2-Section)	12"			1				0		1 Wood Utility Pole
Vehicular Signal Qty	8"							0		1 Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"	2	2	2	2			8		1 Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8"							0		Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"							0		
Vehicular Signal Qty	8"							0	Condition of	X Good Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: Strain pole painted green
Vehicular Signal Qty	8"							0	• • •	Date tag painted over
(4-Sect, 3 SOLID & 1 ARROW)	12"							0		Paint chipping
Vehicular Signal Qty	8"							0		
(4-Section FYA)	12"							0	Strain Pole Bottom	Present X Not Present
Vehicular Signal Qty	8"							0	Tether Wire:	Remarks: N/A
(5-Section)	12"							0		Nomaria. Nya
"X" if Incandescent	. –	Х	Х	Х	х			-		
"X" if LED		~	~	· · · · ·	~			-		
(Qty) of Opt Programmed				<u> </u>				0	Vehicular	X Good Poor
(Qty) of Visors		6	6	6	6			24	Signal Heads:	
(Qty) of Backplates, Black		2	2	2	2			8	olghai ricado.	Remarks: EB heads not 40' from stop bar
(Qty) of Backplates, High V	lisibility				-			0		
(Qty) of Louvers	isibility									
								0	Dedestrian	Cood
(Qty) of Signal Strobes	00.5							0	Pedestrian	GoodPoor
	SP-5			.				0	Signal Heads:	Remarks: N/A
	SP-6			.				0		
Pedestrian Signal Qty	SP-7							0		
	SP-8							0		
	SP-9							0	Type & Number of	Strain Pole / Mast Arm
"X" if Incandescent				ļ				-	Push Button	Pedestal
"X" if LED								-	Supports:	Stub Pole
(Qty) of Tunnel Visors								0		Remarks: N/A
(Qty) of Louvers								0		
Pedestrian Push Button G	-							0		
"X" if < 2 Inch Diameter								-		
"X" if 2 Inch Diameter B	utton							-	Preemption	Emergency Vehicle
"X" if APS								-	Purpose:	Railroad
Preemption								0		Transit
"X" if Optical										
"X" if Audible									Signing & PM:	Remarks: High visibility x-walks EB/NB/SB
"X" if Radio		ļ		 	 	.	ļ			Faded x-walk markings EB
"X" if GPS		ļ				.	ļ			Faded arrow marking WB
"X" if Confirmation Light										
Damaged/Faded Sign Qty								0		
(Qty) of Overhead St Name Signs								0	Curb Ramp:	Remarks: All good where present
(Qty) of Internally Illuminated		ļ				.	ļ	0		SE quad curb ramp no DWS
(Qty) of LED Blank-Out Si	gns	ļ		 	 	.	ļ	0		
(Qty) of Flashing Warning S	Signs							0		
Faded Pav't Markings Qty	1			60				60		
"X" if Curb Ramps Prese	nt	Х	Х	Х					Truncated Domes a	at all corners? No
"X" if Truncated Domes Pre-	sent		Х	Х						
				Overhe	ad Pole	e or Mas	st Arm N	lounted	Equipment	
"X" if Video Detectors		ļ		 		.	ļ		Misc. Equip.:	Remarks: Microwave detection
"X" if Radar Detectors				 		<u> </u>		<u> </u>		antenna/receiver on utility pole NE quad
"X" if Communication Ar	nt.									

	Intersec	tion #:		Corridor Name: Int. Street Name: Int. Street Name:	Church St		
Cabinet T	ype:	Type of Oper	ation:	Type of Coo	rdination:		Cabinet Maintenance:
Х	NEMA	Pre-Tim	ed	None			X Filter Present
	Type 170	Semi-Ad	ctuated	TBC w	/o GPS		Permit Plan Present
	Electromechanical	X Fully-Ac	tuated	X TBC w	/ GPS		Moisture Issues
	Flasher			Hardwi	re Twisted Pair		
	ATC			Fiber C	Optic Cable		
				Spread	I Spectrum Radi	io	
abinet D	<u>etails:</u>						
NE	Location (Quadrant)	Type of	Mounting	Power Source	•	Access	sories
40%	Capacity (% Full)		Type I (Base)	X Underg	ground	х	Police Access Panel
Good	Overall Condition (Good / Poor		Type II (Pole)	Overhe	ead		Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	w/ Met	er	Х	Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?	ted ?) CF-1 VDOT Standard		Rusted Discon	nect Enclosure		UPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	ion (Rusted ?)	Х	UPS (Mounted to Sig. Cab.)
			SE-4 Type A (0	Ov <u>erhead)</u> VDOT (SE-1 t	Standard hru SE-11)		Com Box

Cabinet Equipment Inventory

MDA

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

Description:

Intersection Approach (NB)



Church St Intersection Approach (EB)



Description: Traffic Signal Cabinet (OPEN)

Description: Beulah Rd

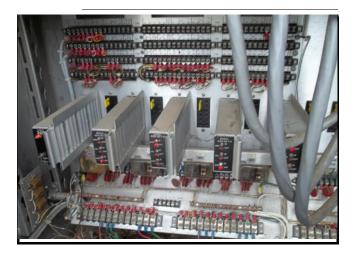
Intersection Approach (SB)



Description: Church St

Intersection Approach (WB)

Description: Traffic Signal Cabinet (OPEN)







Intersection #: 13

Corridor Name: Beulah Rd Int. Street Name: Church St Int. Street Name: -

Description: Police Access Panel



Description: Uninterruptible Power Supply Cabinet (Closed)

Description: Electrical Service Disconnect



Description: Uninterruptible Power Supply Cabinet (Open)









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





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:			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.



General Signal Equipment Inventory:

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

14

Intersection #:

Corridor Name: Follin Ln Int. Street Name: Echols St

Int. Street Name: _____

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply	
Vehicular Signal Qty	8"							0	Type & Number of	2 VDOT Std. M	/last Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. S	Strain Poles
Vehicular Signal Qty	8"							0		Decorative N	/last Arms
(2-Section)	12"							0		Decorative S	Strain Pole
Vehicular Signal Qty	8"							0		2 Hand Hole o	n Pole (Yes or No)
(3-Section ALL SOLID)	12"	2	2	2	2			8		2 Date Tag on	Pole (Yes or No)
Vehicular Signal Qty	8″							0		2 Pedestal	
(3-Sect, RED SOLID & 2 ARROWS)	12"							0			
Vehicular Signal Qty	8″							0	Condition of	X Good	Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: Dual mast a	rms
Vehicular Signal Qty	8″							0		Painted green, tags pa	inted over
(4-Sect, 3 SOLID & 1 ARROW)	12"							0		Paint chipping	
Vehicular Signal Qty	8"							0			
(4-Section FYA)	12"							0	Strain Pole Bottom	Present	Not Present
Vehicular Signal Qty	8″							0	Tether Wire:	Remarks: N/A	
(5-Section)	12"							0			
"X" if Incandescent								-			
"X" if LED		X	X	X	X			-			
(Qty) of Opt Programmed								0	Vehicular	X Good	Poor
(Qty) of Visors		6	6	6	6			24	Signal Heads:	Remarks: N/A	
(Qty) of Backplates, Black								0			
(Qty) of Backplates, High V	isibility	2	2	2	2			8			
(Qty) of Louvers								0			
(Qty) of Signal Strobes								0	Pedestrian	X Good	Poor
	SP-5							0	Signal Heads:	Remarks: N/A	
	SP-6			Ι				0			
Pedestrian Signal Qty	SP-7							0			
	SP-8	0	2	2	0			4			
	SP-9							0	Type & Number of	1 Strain Pole /	Mast Arm
"X" if Incandescent								-	Push Button	3 Pedestal	
"X" if LED		X	Х	Х	Х			-	Supports:	Stub Pole	
(Qty) of Tunnel Visors								0		Remarks: N/A	
(Qty) of Louvers								0			
Pedestrian Push Button G	lty	0	2	2	0			4			
"X" if < 2 Inch Diameter	Button							-			
"X" if 2 Inch Diameter B	utton		X	X				-	Preemption	Emergency	Vehicle
"X" if APS			Х	Х				-	Purpose:	Railroad	
Preemption								0		Transit	
"X" if Optical											
"X" if Audible									Signing & PM:	Remarks: High visibility	/ x-walks WB & 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:	Remarks: All good whe	ere present.
(Qty) of Internally Illuminated								0			
(Qty) of LED Blank-Out Signs								0			
(Qty) of Flashing Warning S	Signs							0			
Faded Pav't Markings Qty								0			
"X" if Curb Ramps Prese	nt		Х	Х					Truncated Domes a	at all corners?	Yes
"X" if Truncated Domes Pres	sent		Х	Х							
		`		Overhe	ad Pole	or Mas	t Arm N	lounted	Equipment		
"X" if Video Detectors		ļ		ļ					Misc. Equip.:	Remarks: N/A	
"X" if Radar Detectors		ļ		 							
"X" if Communication Ar	nt.										

	Intersed	:tion #:		Corridor Name: Int. Street Name: Int. Street Name:	Echols St		
Cabinet T	<u>ype:</u>	Type of C	Operation:	Type of Coo	rdination:		Cabinet Maintenance:
Х	NEMA	Pre	e-Timed	None		-	X Filter Present
	Туре 170	Se	mi-Actuated	TBC w	/o GPS	-	Permit Plan Present
	Electromechanical	X Ful	ly-Actuated	X TBC w	/ GPS	-	Moisture Issues
	Flasher			Hardwi	re Twisted Pair		
	ATC			Fiber C	ptic Cable		
				Spread	Spectrum Radi	0	
abinet D	Details:						
SE	Location (Quadrant)	Ту	pe of Mounting	Power Source		Access	ories
40%	Capacity (% Full)		Type I (Base)	X Underg	round	X	Police Access Panel
Poor	Overall Condition (Good / Poor)	Type II (Pole)	Overhe	ad		Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	w/ Met	er	Х	Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted '	?) C	F-1 VDOT Standard	No Rust Discon	nect Enclosure		UPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)		UPS (Mounted to Sig. Cab.)
			SE-3 Type B (Und	der <u>ground)</u> VDOT (SE-1 t	Standard hru SE-11)		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	lota 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 LnInt. Street Name:Echols StInt. Street Name:-

Description: Follin Ln

Intersection Approach (NB)



Description: Echols St Intersection Approach (EB)



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



Description: Follin Ln

Intersection Approach (SB)

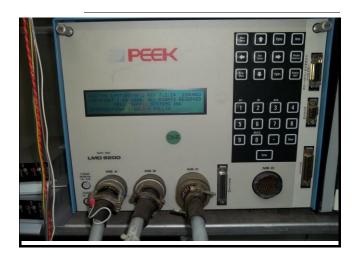


Description: Echols St

Intersection Approach (WB)



Description: Traffic Signal Cabinet (OPEN)





Intersection #: 14

Corridor Name: Follin Ln Int. Street Name: Echols St Int. Street Name: -

Description: Police Access Panel



Description: Traffic Signal Pole Foundation Damage and Soil Erosion



Description: Accessible Pedestrian Signals (APS)



Description: Electrical Service Disconnect



Description: Generator Power Transfer Switch



Description: Accessible Pedestrian Signals (APS)



Intersection 15

Route 123 (Maple Ave) and Vienna Plaza HAWK Signal





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.



15

Intersection #:

Corridor Name: Route 123 (Maple Ave)

Int. Street Name: Vienna Plaza HAWK Signal

Int. Street Name: -

General Signal Equipmen	nt Inver	<u>ntory:</u>									
Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply	
Vehicular Signal Qty	8"							0	Type & Number of	1 VDOT Std. M	ast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. St	rain Poles
Vehicular Signal Qty	8"							0		Decorative Ma	ast Arms
(2-Section)	12"							0		Decorative St	rain Pole
Vehicular Signal Qty	8"							0		1 Hand Hole on	Pole (Yes or No)
(3-Section ALL SOLID)	12"			2	2			4		1 Date Tag on I	Pole (Yes or No)
Vehicular Signal Qty	8"							0		1 Pedestal	
(3-Sect, RED SOLID & 2 ARROWS)	12"							0			
Vehicular Signal Qty	8"							0	Condition of	X Good	Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: All new painte	d green
Vehicular Signal Qty	8"							0			
(4-Sect, 3 SOLID & 1 ARROW)	12"							0			
Vehicular Signal Qty	8"							0			
(4-Section FYA)	12"							0	Strain Pole Bottom	Present	Not Present
Vehicular Signal Qty	8"							0	Tether Wire:	Remarks: N/A	
(5-Section)	12"							0			
"X" if Incandescent								-			
"X" if LED				X	X			-			
(Qty) of Opt Programmed								0	Vehicular	X Good	Poor
(Qty) of Visors				6	6			12	Signal Heads:	Remarks: All new	
(Qty) of Backplates, Black								0			
(Qty) of Backplates, High V	isibility			2	2			4			
(Qty) of Louvers								0			
(Qty) of Signal Strobes	1							0	Pedestrian	X Good	Poor
	SP-5							0	Signal Heads:	Remarks: All new	
	SP-6							0			
Pedestrian Signal Qty	SP-7							0			
	SP-8	1	1					2			
	SP-9							0	Type & Number of	1 Strain Pole / M	/last Arm
"X" if Incandescent								-	Push Button	1 Pedestal	
"X" if LED		X	X					-	Supports:	Stub Pole	
(Qty) of Tunnel Visors								0		Remarks: All new	
(Qty) of Louvers		1	1					2			
Pedestrian Push Button G	lty	1	1					2			
"X" if < 2 Inch Diameter								-			
"X" if 2 Inch Diameter B	utton	X	X					-	Preemption	Emergency V	ehicle
"X" if APS		Х	Х					-	Purpose:	Railroad	
Preemption								0		Transit	
"X" if Optical											
"X" if Audible									Signing & PM:	Remarks: Brick x-walk	
"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 Illumina								0			
(Qty) of LED Blank-Out Signs		ļ	ļ	ļ	ļ			0			
(Qty) of Flashing Warning Signs								0			
Faded Pav't Markings Qty				L	L			0			
"X" if Curb Ramps Prese		X	X	ļ	ļ			\square	Truncated Domes a	at all corners?	Yes
"X" if Truncated Domes Pres	sent	X	Х								
				Overhe	ead Pole	or Mas	at Arm N	lounted	Equipment		
"X" if Video Detectors		ļ		ļ	.				Misc. Equip.:	Remarks: N/A	
"X" if Radar Detectors				ļ	ļ						
"X" if Communication Ar	nt.			1	1						

	Intersec	tion #:		Corridor Name: Int. Street Name: Int. Street Name:			al
Cabinet Ty	/pe:	Type of	Operation:	Type of Coo	rdination:	Ca	abinet Maintenance:
Х	NEMA	Pr	re-Timed	X None			X Filter Present
	Type 170	X Se	emi-Actuated	TBC w	o GPS		Permit Plan Present
	Electromechanical	Fu	ully-Actuated	TBC w	GPS		Moisture Issues
	Flasher			Hardwi	re Twisted Pair		
	ATC			Fiber C	ptic Cable		
				Spread	Spectrum Radi	io	
abinet De	etails:						
SE	Location (Quadrant)	Ту	ype of Mounting	Power Source		Accessori	es
75%	Capacity (% Full)		Type I (Base)	X Underg	round	X Pol	lice Access Panel
Good	Overall Condition (Good / Poor)		X Type II (Pole)	Overhe	ad	Ма	inual Cord
No Rust	Bottom Condition (Rusted ?)		Pedestal	X w/ Mete	er	Ge	nerator Adaptor Kit
No Rust	Boot / Conduit Elbow (Rusted ?)	VDOT Standard	No Rust Discon	nect Enclosure	UP	S (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)	UP	S (Mounted to Sig. Cab.)
			SE-3 Type B (Und	der <u>ground)</u> VDOT (SE-1 t	Standard hru SE-11)	Co	m 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



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



Description: Traffic Signal Cabinet (OPEN)

Description: Pedestrian Crosswalk



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: -

Police Access Panel Description:



Accessible Pedestrian Signals (APS) Description:

ĸ If Star OB TIME REMA DON'T CROSS TO GROSS PUSH BUTTO

Description: Accessible Pedestrian Signals (APS)



Description: Electrical Service Disconnect



Accessible Pedestrian Signals (APS) Description:



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



Intersection 16

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





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.



16

Intersection #:

Corridor Name: Route 123 (Maple Ave)

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

Int. Street Name: -

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



16 Corridor Name: Route 123 (Maple Ave) Intersection #: James Madison Dr. (Future HAWK Signal) Int. Street Name: Int. Street Name: Cabinet Type: Type of Operation: Type of Coordination: Cabinet Maintenance: NEMA Pre-Timed None Filter Present TBC w/o GPS Type 170 Semi-Actuated Permit Plan Present Fully-Actuated TBC w/ GPS Electromechanical Moisture Issues Flasher Hardwire Twisted Pair ATC Fiber Optic Cable Spread Spectrum Radio Cabinet Details: Type of Mounting Location (Quadrant) Power Source Accessories Capacity (% Full) Type I (Base) Underground Police Access Panel Overall Condition (Good / Poor) Type II (Pole) Overhead Manual Cord Bottom Condition (Rusted ?) Pedestal w/ Meter Generator Adaptor Kit Boot / Conduit Elbow (Rusted ?) VDOT Standard **Disconnect Enclosure** UPS (Separate Cab.) (CF-1, CF-3, CF-4) Condition (Rusted ?) UPS (Mounted to Sig. Cab.) VDOT Standard Com Box (SE-1 thru SE-11)

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



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



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



- Description: Pedestrian Crosswalk
 - Intersection Approach (SB)



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



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





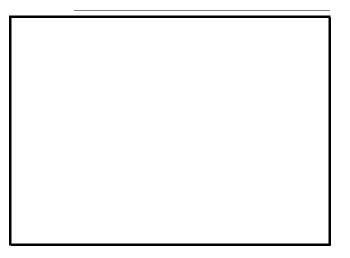
- Intersection #: 16
- Corridor Name: Route 123 (Maple Ave)
- Int. Street Name: James Madison Dr. (Future HAWK Signal)
 Int. Street Name: -
- Description: Signal Mast Arm Pole Foundation South of Route 123 (Maple Ave) (EB approach signal foundation)



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



Description:



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:



Intersection 17

Electric Ave and Navy Federal Credit Union Ent





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:			Fairfax County
Latest Revision Date:			Chad Charles / (P) 703-319-8603 / (C) 571-274-3373
			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.



General Signal Equipment Inventory:

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

17

Intersection #:

Corridor Name: Electric Ave

Int. Street Name: Navy Federal Credit Union Ent

Int. Street Name: -

Signal Equipment		NB	SB	EB	WB			TOTAL		"X" All that Apply
Vehicular Signal Qty	8"							0	Type & Number of	4 VDOT Std. Mast Arms
(1-Section)	12"							0	Signal Supports:	VDOT Std. Strain Poles
Vehicular Signal Qty	8"							0		Decorative Mast Arms
(2-Section)	12"							0		Decorative Strain Pole
Vehicular Signal Qty	8"							0		4 Hand Hole on Pole (Yes or No)
(3-Section ALL SOLID)	12"	2	3	1	1			7		4 Date Tag on Pole (Yes or No)
Vehicular Signal Qty	8"							0		3 Pedestal
(3-Sect, RED SOLID & 2 ARROWS)	12"							0		
Vehicular Signal Qty	8"							0	Condition of	X Good Poor
(3-Section ALL ARROWS)	12"							0	Signal Supports:	Remarks: All new painted green
Vehicular Signal Qty	8"							0		
(4-Sect, 3 SOLID & 1 ARROW)	12"							0		
Vehicular Signal Qty	8"							0		
(4-Section FYA)	12"							0	Strain Pole Bottom	
Vehicular Signal Qty (5-Section)	8"							0	Tether Wire:	Remarks: N/A
. ,	12"			1	1			2		
"X" if Incandescent "X" if LED		~	~	~	~			-		
		X	X	X	X			-	Vahiaular	X Good Poor
(Qty) of Opt Programmed								0	Vehicular Signal Heads:	
(Qty) of Visors (Qty) of Backplates, Black		2	3	2	2			9	Signal Heads:	Remarks: All new
(Qty) of Backplates, Black	licibility	~	3	~	~			0		
(Qty) of Louvers	isioiiity							0		
(Qty) of Signal Strobes								0	Pedestrian	X Good Poor
(Qty) of Signal Strobes	SP-5							0	Signal Heads:	
	SP-6							0	Signal Heads.	Remarks: All new
Pedestrian Signal Qty	SP-7							0		
r cucstnan orginal wry	SP-8							0		
	SP-9	0	2	2	2			6	Type & Number of	3 Strain Pole / Mast Arm
"X" if Incandescent	0, 0	v	-	-	-			-	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 0	Qty		2	2	2			6		
"X" if < 2 Inch Diameter								-		
"X" if 2 Inch Diameter B	utton		Х	Х	Х			-	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			ļ	ļ	ļ		ļ	ļ		
"X" if Confirmation Light										
Damaged/Faded Sign Qty								0		
(Qty) of Overhead St Nam	•	1	1	1	1			4	Curb Ramp:	Remarks: All new. Shared landings.
(Qty) of Internally Illumina			ļ	 			ļ	0		
(Qty) of LED Blank-Out Signs			ļ	ļ	ļ		 	0		
(Qty) of Flashing Warning S	•							0		
Faded Pav't Markings Qty								0	. =	
"X" if Curb Ramps Prese			X	X	X				Truncated Domes a	at all corners? Yes
"X" if Truncated Domes Pre	sent		X	X	X And Pole	or Me	A rune -	lounter	l Equipment	
"V" if Video Detector		V	V	1	1	orwas	st Arm N	nounted		
"X" if Video Detectors		X	X	X	X		 		Misc. Equip.:	Remarks: N/A
"X" if Radar Detectors			 	 			 			
"X" if Communication A	п.									

	Intersec	tion #:	17	Corridor Name: Int. Street Name:		Credit (Union Ent
				Int. Street Name:	-		
abinet Typ	e:	Type	of Operation:	Type of Coo	rdination:		Cabinet Maintenance:
	NEMA		Pre-Timed	X None			X Filter Present
	Туре 170		Semi-Actuated	TBC w/	o GPS		X Permit Plan Present
	Electromechanical	Х	Fully-Actuated	TBC w/	GPS		Moisture Issues
	Flasher		-	Hardwi	re Twisted Pair		
Х	ATC			Fiber C	ptic Cable		
				Spread	Spectrum Radi	io	
abinet Deta	ails:						
NE	Location (Quadrant)		Type of Mounting	Power Source		Acces	sories
40%	Capacity (% Full)		Type I (Base)	X Underg	round	Х	Police Access Panel
Good	Overall Condition (Good / Poor)	1	Type II (Pole)	Overhe	ad	Х	Manual Cord
N/A	Bottom Condition (Rusted ?)		Pedestal	X w/ Mete	er	Х	Generator Adaptor Kit
N/A	Boot / Conduit Elbow (Rusted ?)	CF-3 VDOT Standard	No Rust Discon	nect Enclosure		UPS (Separate Cab.)
			(CF-1, CF-3, CF-4)	Conditi	on (Rusted ?)	Х	UPS (Mounted to Sig. Cab.)
				SE-5 VDOT	Standard	Х	Com Box

(SE-1 thru SE-11)

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 4/1	7
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: Electric Ave Intersection Approach (EB)



Description: Traffic Signal Cabinet (CLOSED)

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



Description: Electric Ave



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
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Description: Uninterruptible Power Supply Cabinet (Closed)

Description: Electrical Service Disconnect



Uninterruptible Power Supply Cabinet (Open) Description:



Description: Uninterruptible Power Supply Cabinet Generator Connection





Description: External Communications Interface Box



APPENDIX B

Detailed Cost Estimate Calculations









Project Summary:

Municipality:	Town of Vienna
Number of Signals:	17
	Route 123 (Maple Ave) Route 243 (Nutley St)

Preliminary Cost Estimates:

	Cost										
Intersection	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 Transparity 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.



- // 0																				
Traffic Signal Equipment Summary																				
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	Total Quantity	Total Cost (\$)
Vehicular Signal Heads																-				
Traf. Sig. Head Sec 12" HVS Backplate - EA Hanger Assembly SM-3, One-Way - EA	\$300 \$400									-								-	0	\$0 \$0
Retrofit 12" Traf. Sig. Head - EA	\$125																		0	\$0
Backplate Modifications - EA	\$300																		0	\$0
Pedestrian Items	÷							1							1					\$16,100
Countdown Pedestrian Signal Head (SP-8) - EA Accessible Pedestrian Signals (APS) Push Buttons - EA	\$700 \$1,250.00						1		8	4	4	8						1	17	\$16,100 \$21,250
Sign Panel - SF	\$37.00								8	4	4	8							24	\$888
CG-12 Detectable Warning Surface - SY Pedestrian Actuation (PA-2) - EA	\$350.00 \$250.00						6												6	\$2,100 \$0
Pedestrian Actuation (PA-3) - EA	\$700.00																		0	\$0
Pedestrian Actuation (PA-4) - EA Hanger Assembly SMB-3, One Way - EA	\$1,000.00 \$200.00						1												1	\$1,000 \$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	A AAA AAA AA	I					4	I		· · · ·					I		I			\$140,000
McCain 352i ATC Cabinet (On Existing Foundation) - EA McCain 352i ATC Cabinet (On New CF-3 Foundation) - EA	\$20,000.00 \$22,500.00		1				1		1	1	1	1		1					0	\$140,000 \$0
McCain 356i ATC Cabinet - EA	\$19,000.00															1			1	\$19,000
Controller Unit Only																				
Reinstall Existing McCain ATC Controller - EA McCain ATC eX2 Controller - EA	\$2,500.00 \$5,000.00	<u> </u>	1				1		1	1	1	1		1		1	<u> </u>		8	\$20,000 \$0
Cabinet Components	<i>\\</i> 0,000.00						L	1							1				•	+0
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 Uninterruptible Power Supply Cabinet Attached (Tesco) - EA	\$450.00 \$3.100.00		1				1		1	1	1	1		1		1	l	<u> </u>	7 7	\$3,150 \$21,700
Managed field Ethernet Switch Gbps - EA	\$3,000.00		1	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	A A AA	I						I				•			I		I			\$ 0
Type B Class I Pave. Line Marking 24* - LF Type B Class I Pave. Line Marking 4* - LF	\$8.00 \$1.00																		0	\$0 \$0
Pvmt Symb Mrkg Sgl Turn Arrow Ty B, CI I - EA	\$250.00																		0	\$0
Double Turn Arrow Thru/LT or RT Type B, CI I - EA	\$300.00 \$37.00																		0	\$0 \$0
Sign Panel - SF 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 Signal Mast Arm Pole MP-3, Type B1 - EA	\$9,500.00 \$10,500.00									-								1	0	\$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 Mast Arm 30' - EA	\$11,000.00 \$2,750.00																		0	\$0 \$0
Mast Arm 40' - EA	\$3,250.00																		0	\$0
Mast Arm 49' - EA	\$4,000.00																		0	\$0 \$0
Mast Arm 60' - EA Mast Arm 65' - EA	\$6,000.00 \$6,500.00																		0	\$0
Mast Arm 70' - EA	\$7,750.00																		0	\$0
Mast Arm 75' Case 1 Loading - EA Mast Arm 75' Case 2 Loading - EA	\$8,250.00 \$9,250.00																		0	\$0 \$0
Test Bore - EA	\$1,900.00																		0	\$0
Concrete Foundation Signal Pole PF-8 - CY	\$1,150.00																		0	\$0 \$0
Pedestal Pole-PF-2 12' - EA Conc. Foundation PF-2 - EA	\$750.00 \$1,100.00	1														1	1	1	0	\$0 \$0
Electrical Service		•	•	•	•			•				•			•	•	•	•	•	•
Electrical Service SE-3 Type A - EA	\$2,500.00																		0	\$0 \$0
Electrical Service SE-4 Type A - EA Miscellaneous	\$2,500.00	l					L	1				1			1		l		U	\$U
Video Detection Camera (Autoscope Vision) - EA	\$4,000.00		4	4	4	4					4	4						1	24	\$96,000
Video Detection System, (4 Video Inputs) (Autoscope Vision) - EA	\$12,000.00		1	1	1	1	675	000	050	450	1	1		650		1125	705		6	\$72,000
Single-Mode Fiber Optic Cable 24 Strand - LF Optical/GPS EVP Detection System 2-way - EA	\$7.00 \$7,500.00		1725	1750	1015	1175	575	860	950	450	1075	650		Uca		1125	725	1	12725 0	\$89,075 \$0
Optical/GPS EVP Detection System 3-way - EA	\$8,500.00																		0	\$0
Optical/GPS EVP Detection System 4-way - EA CCTV Camera Digital - EA	\$10,000.00 \$5,500.00			1													<u> </u>	<u> </u>	0	\$0 \$5,500
Digital Video Encoder - EA	\$2,500.00			1															1	\$2,500
Reprogram Controller - LS	\$750.00																		0	\$0 \$0
Junction Box, JB-S1 - EA Junction Box, JB-S2 - EA	\$1,250.00 \$1,150.00	1														1	1	1	0	\$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							1							1				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 Transparity 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 \$0	\$10,931 \$83,806	\$7,688 \$58,938	\$5,716 \$43,821	\$5,884 \$45,109	\$6,176 \$47,351	\$1,773 \$13,593	\$8,722 \$66,868	\$6,585 \$50,483	\$11,756 \$90,129	\$10,687 \$81,933	\$0 \$0	\$5,603 \$42,953	\$0 \$0	\$4,856 \$37,231	\$1,211 \$9,286	\$0 \$0		\$87,587 \$701,500
SUBTOTAL - CONSTRUCTION Contingency (\$)	25%	\$0 \$0	\$83,806 \$20,952	\$58,938 \$14,734	\$43,821 \$10,955	\$45,109 \$11,277	\$47,351 \$11,838	\$13,593 \$3,398	\$66,868 \$16,717	\$50,483 \$12,621	\$90,129 \$22,532	\$81,933 \$20,483	\$0 \$0	\$42,953 \$10,738	\$0 \$0	\$37,231 \$9,308	\$9,286 \$2,322	\$0 \$0		\$167,875
TOTAL - CONSTRUCTION BUDGET	20/0	\$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



Traffic Signal Equipment Summary																				
	Ave. Unit Cost	1 - Nutley St @	2 - Nutley St @	3 - Maple Ave @	4 - Maple Ave @	5 - Maple Ave @	6 - Maple Ave @	7 - Maple Ave @	8 - Maple Ave @	9 - Maple Ave @	10 - Maple Ave @	11 - Maple Ave @	12 - Maple Ave @	13 - Beulah Rd @	14 - Follin Ln @	15 - Maple Ave @ Vienna Plaza	16 - Maple Ave @ James Madison	17 - Electric Ave @	Total	Total Cost
Item / Category	(\$)	Tapawingo Rd	Courthouse Rd	Nutley St	Courthouse Rd	Center St	W&OD Trail	Park St	Glyndon St	Branch Rd	Beulah Rd	East St	Follin Ln	Church St	Echols St	HAWK Signal	HAWK Signal	NFCU Drwy	Quantity	(\$)
Vehicular Signal Heads Traf. Sig. Head Sec 12" HVS Backplate - EA	\$300	1	1	1	1				1		1				1	1	1	1	0	\$0
Hanger Assembly SM-3, One-Way - EA	\$400																		0	\$0
Retrofit 12" Traf. Sig. Head - EA Backplate Modifications - EA	\$125 \$300			3															3	\$375 \$0
Pedestrian Items		4	4				8				ł									
Countdown Pedestrian Signal Head (SP-8) - EA	\$700																	6	0	\$0 \$7,500
Accessible Pedestrian Signals (APS) Push Buttons - EA Sign Panel - SF CG-12 Detectable Warning Surface - SY	\$1,250.00 \$37.00																	0	0	\$7,500
CG-12 Detectable Warning Surface - SY Pedestrian Actuation (PA-2) - EA	\$350.00 \$250.00																		0	\$0 \$0
Pedestrian Actuation (PA-3) - EA	\$700.00																		0	\$0
Pedestrian Actuation (PA-4) - EA Hanger Assembly SMB-3, One Way - EA	\$1,000.00 \$200.00																		0	\$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			1				1		1				1				1	0	\$0
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	1	1	1		1	1	1	1	1	0	\$0
Uninterruptible Power Supply Battery Pack (Tesco) - EA	\$450.00																		0	\$0 \$0
Uninterruptible Power Supply Cabinet Attached (Tesco) - EA Managed field Ethernet Switch Gbps - EA	\$3,100.00 \$3,000.00																	1	0	\$0 \$3,000
Electronic Security Lock - EA	\$500.00	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	1	1	1			I				1							1	0	¢0
Type B Class I Pave. Line Marking 4" - LF	\$1.00																		0	\$0 \$0
Pvmt Symb Mrkg Sgl Turn Arrow Ty B, CI I - EA Double Turn Arrow Thru/LT or RT Type B, CI I - EA	\$250.00 \$300.00																		0	\$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	1	1	1			2		1	1	1			1	1	1	1	1	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 Signal Mast Arm Pole MP-3, Type B2 - EA	\$10,500.00 \$12,500.00																		0	\$0 \$0
Signal Mast Arm Pole MP-3, Type C - EA	\$11,000.00																		0	\$0
Mast Arm 30' - EA Mast Arm 40' - EA	\$2,750.00 \$3,250.00																		0	\$0 \$0
Mast Arm 49' - EA	\$4,000.00																		0	\$0 \$0
Mast Arm 60' - EA Mast Arm 65' - EA	\$6,000.00 \$6,500.00																		0	\$0
Mast Arm 70' - EA	\$7,750.00																		0	\$0 \$0
Mast Arm 75' Case 1 Loading - EA Mast Arm 75' Case 2 Loading - EA	\$8,250.00 \$9,250.00																		0	\$0
Test Bore - EA	\$1,900.00 \$1,150.00																		0	\$0 \$0
Concrete Foundation Signal Pole PF-8 - CY 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		1		T				1	1	1		3	\$7,500
Electrical Service SE-4 Type A - EA	\$2,500.00									l				l					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 Optical/GPS EVP Detection System 2-way - EA	\$7.00 \$7,500.00						1		<u> </u>						<u> </u>	<u> </u>	<u> </u>		0	\$0 \$7,500
Optical/GPS EVP Detection System 3-way - EA	\$8,500.00									1	1	1							3	\$25,500
Optical/GPS EVP Detection System 4-way - EA CCTV Camera Digital - EA	\$10,000.00 \$5,500.00	1	1	1	1	1		1	1				1					1	9	\$90,000 \$0
Digital Video Encoder - EA	\$2,500.00																		0	\$0
Reprogram Controller - LS Junction Box, JB-S1 - EA	\$750.00 \$1,250.00								1		1				1	1	1		0	\$0 \$0
Junction Box, JB-S2 - EA	\$1,150.00																		0	\$0
Junction Box, JB-S3 - EA 5.8 GHZ Wireless Broadband Radio - EA																			0	\$0 \$0
Total Signal Equipment Cost (C)		\$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
Total Signal Equipment Cost (\$) McCain Transparity TMS Software and Setup - Lump Sum (\$)		\$10,500 \$0	\$10,500 \$0	\$13,375 \$0	\$10,500 \$0	\$10,500 \$0	\$17,500 \$0	\$10,500 \$0	\$13,000 \$0	\$9,000 \$0	\$9,000 \$0	\$9,000 \$0	\$10,500 \$0	\$0 \$0	\$0 \$0	\$500 \$0	\$500 \$0	\$49,000 \$0		\$183,875
MOT, Mobilization, Equipment Package, and Schedule	15%	\$1,575	\$1,575	\$2,006	\$1,575	\$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	25%	\$12,075 \$3,019	\$12,075 \$3,019	\$15,381 \$3,845	\$12,075 \$3,019	\$12,075 \$3,019	\$20,125 \$5,031	\$12,075 \$3,019	\$14,950 \$3,738	\$10,350 \$2,588	\$10,350 \$2,588	\$10,350 \$2,588	\$12,075 \$3,019	\$0 \$0	\$0 \$0	\$575 \$144	\$575 \$144	\$56,350 \$14,088		\$211,456 \$52,864
Contingency (\$) TOTAL - CONSTRUCTION BUDGET	23%	\$3,019 \$15,094	\$3,019 \$15,094	\$3,845 \$19,227	\$3,019 \$15,094	\$15,094	\$25,156	\$15,094	\$3,738 \$18,688	\$2,588 \$12,938	\$2,588 \$12,938	\$2,588 \$12,938	\$15,094	\$0 \$280,000	\$0 \$288,460	\$144 \$719	\$144 \$719	\$70,438		\$832,780
Design (\$)	15%	\$2,264	\$2,264	\$2,884	\$2,264	\$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	\$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	\$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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