


**WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY**  
**600 Fifth Street, NW, Washington, DC 20001**  
**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

1. AMENDMENT / MODIFICATION NO. <b>A002</b>		2. EFFECTIVE DATE <b>June 5, 2015</b>	
3. ISSUED BY Office of Procurement and Materials Ruby S. Coley, Contract Administrator 3500 Pennsy Drive, Bldg. B, Room B-107 Landover, MD 20785		4. ADMINISTERED BY (if other than block 3)  Email: <a href="mailto:rcoley@wmata.com">rcoley@wmata.com</a> Office No. (301) 955-7173	
5. CONTRACTOR NAME AND ADDRESS  <small>(Street, City County, State, and Zip Code)</small>		6 FORM TYPE (CHECK ONLY ONE) <input checked="" type="checkbox"/> AMENDMENT OF SOLICITATION NO. <u>FQ15186/RSC</u> DATED <u>April 28, 2015</u> (see block 7)  _____ MODIFICATION OF CONTRACT NO. _____ DATED _____ (See block 9)	
		7 THIS BLOCK APPLIES ONLY TO AMENDMENTS OF SOLICITATIONS <input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in block 10. The hour and date specified for receipt of Offers _____ is extended, <input checked="" type="checkbox"/> is not extended. Offerors must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation, or as amended, by one of the following methods; (a) By signing and returning <u>one</u> copy of this amendment, (b) by acknowledging receipt of this amendment on each copy of the offer submitted; or (c) by separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE ISSUING OFFICE PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If, by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided such telegram makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.	
8. ACCOUNTING AND APPROPRIATION DATA (If required) <p style="text-align: center;">N/A</p>			
9. THIS BLOCK APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS (a) _____ Change Order is issued pursuant to _____ The Changes set forth in block 10 are made to the above numbered contract/order. (b) _____ The above numbered contract/order is modified to reflect the administrative changes (such as changes in paying office, appropriation data, etc.) set forth in block 10. (c) _____ This Supplemental Agreement is entered into pursuant to _____			
10. DESCRIPTION OF AMENDMENT/MODIFICATION. (a) RFP No. FQ15186/RSC for Bus CCTV On-Board Surveillance System is amended to include changes. (b) Changes are denoted with a ## symbol at the beginning and ending of each changed paragraph. (c) The Request for Proposal due date remains the same, Wednesday, July 1, 2015 at 3:00 p.m.			
-- Continued on Page 2 --			
Except as provided herein, all terms and conditions of the document referenced in block 6, as heretofore changed, remain unchanged and in full force and effect through the contract period.			
11. <input checked="" type="checkbox"/> CONTRACTOR/OFFEROR IS REQUIRED TO SIGN THIS DOCUMENT AND RETURN <u>ONE</u> COPY(IES) TO ISSUING OFFICE.		11. _____ CONTRACTOR/OFFEROR IS NOT REQUIRED TO SIGN THIS DOCUMENT	
12. NAME OF CONTRACTOR/OFFICE  BY _____ (Signature of person authorized to sign)		12. WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  BY  (Signature of person authorized to sign)	
13. NAME AND TITLE OF SIGNER (Type or print)	14. DATE SIGNED	15. NAME OF CONTRACTING OFFICER (Type or print) <b>Lisa Dunlap</b>	17. DATE SIGNED <b>6/5/15</b>

**AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT**

**RFP No. FQ15186/RSC**

**Bus CCTV On-Board Surveillance System**

**Amendment No. 002 Changes**

**Solicitation, Offer and Award Form:**

Remove page 9, replace with page 9, Amendment No. 002.

**Price Schedule:**

Remove pages 1 thru 6, replace with pages 1 thru 6, Amendment No. 002

**Solicitation Instructions:**

Remove pages 22 thru 24, replace with pages 22 thru 24, Amendment No. 002.

**Scope of Work:**

Remove page SOW-122, replace with page SOW-122, Amendment No. 002.

Remove page SOW-131, replace with page SOW-131, Amendment No. 002.

Remove pages SOW-136 thru SOW-143, replace with pages SOW-136 thru SOW-143, Amendment No. 002.

**Bus Based Network Connection:**

Add document, insert pages 1 thru 3, Amendment No. 002.

**-- End Amendment No. 002 --**



WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY  
**SOLICITATION, OFFER AND AWARD**

CONTRACT NO.	SOLICITATION NO. RFP FQ15186/RSC <input type="checkbox"/> ADVERTISED <input checked="" type="checkbox"/> NEGOTIATED	DATE ISSUED <b>April 28 2015</b>	ADDRESS OFFER TO OFFICE OF PROCUREMENT Office of Procurement 600 Fifth Street NW Washington, DC 20001
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**SOLICITATION**

Sealed offer in one (1) original and FOUR ELECTRONIC USB copies for furnishing the supplies or services in the schedules will be received at **##** the Authority until 3:00 P.M. local time July 1, 2015 **##**  
 (Hour) (Date)

If this is an advertised solicitation, offers will be publicly opened at that time.  
**## CAUTION – LATE OFFERS:** See paragraph 9 of Solicitation Instructions. **##**

- All offers are subject to the following:
1. The Solicitation Instructions which are attached.
  2. The General Provisions, which are attached.
  3. The Schedule included herein and/or attached hereto.
  4. Such other provisions, representations, certifications, and specifications, as are attached or incorporated herein by reference.

Proposer's Phone Number \_\_\_\_\_ Proposer's Fax Number \_\_\_\_\_

Email Address: \_\_\_\_\_

**SCHEDULE**

ITEM NO.	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
<b>##</b>	BUS CCTV ON-BOARD SURVEILLANCE SYSTEM  (See continuation of schedule on page 22)				<b>##</b>

DUN & BRADSTREET ID NUMBER:

**OFFEROR**

Name and Address (Street, city, county, state, and zip code)	Name and Title of Person Authorized to Sign Offer (Print or Type)	
	Signature	Offer Date
<input type="checkbox"/>	Check if remittance is different from above — enter such address in Schedule	

**AWARD (To be completed by The Authority)**

ACCEPTANCE AND AWARD ARE HEREBY MADE FOR THE FOLLOWING ITEM(S):

ITEM NO.	QUANTITY	UNIT	UNIT PRICE

The total amount of this award is \$ \_\_\_\_\_

\_\_\_\_\_  
Name of Contracting Officer (Print of Type)

\_\_\_\_\_  
WASHINGTON METROPOLITAN AREA TRANSIT AUTHORITY

\_\_\_\_\_  
AWARD DATE

Amendment No. 002

BUS CCTV ONBOARD SURVEILLANCE SYSTEM - PRICE SCHEDULE - YEAR 1				
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>7-Camera Transit Bus</b>				
Video Recorder		108		
Removable Hard Drive		108		
## Solid State Drive (SSD)		108		##
Camera 1 Forward Facing Front Windshield		108		
Camera 2 View of Front Door & Farebox w/IR		108		
Camera 3 Mounted near front of bus with a front to rear view		108		
Camera 4 View of rear door & a portion of the rear seats		108		
Camera 5 External (outside) side view camera on curbside of bus		108		
Camera 6 External (outside) side view camera on streetside of bus		108		
Camera 7 Mounted in rear of bus facing forward		108		
Microphone		108		
Install Interface between contractor VR & the existing IVN Emergency Alarm (EA) Switch		108		
Cable		108		
Installation - 7-Camera System	N/A	108		
<b>7 - Camera Transit Bus Total</b>				\$0.00
<b>9-Camera Transit Bus</b>				
Video Recorder		44		
Removable Hard Drive		44		
## Solid State Drive (SSD)		44		##
Camera 1 Forward facing Front Windshield		44		
Camera 2 View of Front Door & Farebox		44		
Camera 3 Mounted near front of bus with a front to rear view		44		
Camera 4 View of rear door & a portion of the rear seats		44		
Camera 5 External (outside) side view camera on curbside of bus		44		
Camera 6 External (outside) side view camera on streetside of bus		44		
Camera 7 Mounted in rear of bus facing forward		44		
Camera 8 Mounted near articulated area facing rear		44		
Camera 9 External (outside) rear view camera mounted on rear of bus		44		
Microphone		44		
Install Interface between contractor VR & the existing IVN Emergency Alarm (EA) Switch		44		
Cable		44		
Installation 9-Camera System	N/A	44		
<b>9 - Camera Transit Bus Total</b>				\$0.00

BUS CCTV ONBOARD SURVEILLANCE SYSTEM - PRICE SCHEDULE - YEAR 1				
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>De-Installation Existing Systems</b>				
De-Install 7-Camera Bus System	N/A	108		\$0.00
De-Install 9-Camera Bus System	N/A	44		\$0.00
<b>De-Installation Existing Systems - Subtotal</b>				
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>Separately Priced Options</b>				
G-Force Sensor On Fixed Route Buses-Installed		152		\$0.00
Metadata (Brakes, Turn Signals, Flashers) On Fixed Route Bus - Installed		152		\$0.00
<b>Separately Priced Options - Subtotal</b>				\$0.00
<b>Warranty/Maintenance</b>				
Warranty-7 Camera Transit Bus (3-Year)		108		\$0.00
Warranty-9 Camera Transit Bus (3-Year)		44		\$0.00
<b>Warranty/Maintenance - Subtotal</b>				\$0.00
Item	Make/ Model	Qty	Unit Cost	Extended Cost
<b>Services</b>				
Engineering	N/A	1		\$0.00
Manuals (M & O)	N/A	1		\$0.00
Training	N/A	1		\$0.00
<b>Services - Subtotal</b>				\$0.00
<b>PRICE SCHEDULE YEAR 1 - TOTAL PRICE</b>				\$0.00

##

##

\_\_\_\_\_  
Authorized Signature

\_\_\_\_\_  
Company Name

\_\_\_\_\_  
Date

Amendment No. 002

BUS CCTV ONBOARD SURVEILLANCE SYSTEM - PRICE SCHEDULE - YEAR 2				
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>7-Camera Transit Bus</b>				
Video Recorder		148		
Removable Hard Drive		148		
## Solid State Drive (SSD)		108		##
Camera 1 Forward Facing Front Windshield		148		
Camera 2 View of Front Door & Farebox w/IR		148		
Camera 3 Mounted near front of bus with a front to rear view		148		
Camera 4 View of rear door & a portion of the rear seats		148		
Camera 5 External (outside) side view camera on curbside of bus		148		
Camera 6 External (outside) side view camera on streetside of bus		148		
Camera 7 Mounted in rear of bus facing forward		148		
Microphone		148		
Install Interface between contractor VR & the existing IVN Emergency Alarm (EA) Switch		148		
Cable		148		
Installation - 7-Camera System	N/A	148		
<b>7 - Camera Transit Bus Total</b>				\$0.00
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>De-Installation Existing Systems</b>				
De-Install 7-Camera Bus System	N/A	148		\$0.00
<b>Separately Priced Options</b>				
G-Force Sensor On Fixed Route Buses-Installed		148		\$0.00
Metadata (Brakes, Turn Signals, Flashers) On Fixed Route Bus - Installed		148		\$0.00
<b>Separately Priced Options- Subtotal</b>				\$0.00
<b>Warranty/Maintenance</b>				
Warranty/Maintenance 7-Camera Transit Bus (3-Year)		148		\$0.00
Item	Make/ Model	Qty	Unit Cost/Bus	Extended Cost
<b>Services</b>				
Engineering	N/A	1		\$0.00
## Manuals (M & O)	N/A	1		\$0.00 ##
Training	N/A	1		\$0.00
<b>Services - Subtotal</b>				\$0.00
<b>PRICE SCHEDULE YEAR 2 - TOTAL PRICE</b>				\$0.00

BUS CCTV ONBOARD SURVEILLANCE SYSTEM - PRICE SCHEDULE - YEAR 3				
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>7-Camera Transit Bus</b>				
Video Recorder		230		
Removable Hard Drive		230		
## Solid State Drive (SSD)		108		##
Camera 1 Forward Facing Front Windshield		230		
Camera 2 View of Front Door & Farebox w/IR		230		
Camera 3 Mounted near front of bus with a front to rear view		230		
Camera 4 View of rear door & a portion of the rear seats		230		
Camera 5 External (outside) side view camera on curbside of bus		230		
Camera 6 External (outside) side view camera on streetside of bus		230		
Camera 7 Mounted in rear of bus facing forward		230		
Microphone		230		
Install Interface between contractor VR & the existing IVN Emergency Alarm (EA) Switch		230		
Cable		230		
Installation - 7-Camera System	N/A	230		
<b>7 - Camera Transit Bus Total</b>				\$0.00
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>De-Installation Existing Systems</b>				
De-Install 7-Camera Bus System	N/A	230		\$0.00
<b>Separately Priced Options</b>				
G-Force Sensor On Fixed Route Buses-Installed		230		\$0.00
Metadata (Brakes, Turn Signals, Flashers) On Fixed Route Bus - Installed		230		\$0.00
<b>Separately Priced Options- Subtotal</b>				\$0.00
<b>Warranty/Maintenance</b>				
Warranty/Maintenance 7-Camera Transit Bus (3-Year)		230		\$0.00
Item	Make/ Model	Qty	Unit Cost/Bus	Extended Cost
<b>Services</b>				
Engineering	N/A	1		\$0.00
## Manuals (M & O)	N/A	1		\$0.00 ##
Training	N/A	1		\$0.00
<b>Services - Subtotal</b>				\$0.00
<b>PRICE SCHEDULE YEAR 3 - TOTAL PRICE</b>				\$0.00

BUS CCTV ONBOARD SURVEILLANCE SYSTEM - PRICE SCHEDULE - YEAR 4				
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>7-Camera Transit Bus</b>				
Video Recorder		231		
Removable Hard Drive		231		
## Solid State Drive (SSD)		108		##
Camera 1 Forward Facing Front Windshield		231		
Camera 2 View of Front Door & Farebox w/IR		231		
Camera 3 Mounted near front of bus with a front to rear view		231		
Camera 4 View of rear door & a portion of the rear seats		231		
Camera 5 External (outside) side view camera on curbside of bus		231		
Camera 6 External (outside) side view camera on streetside of bus		231		
Camera 7 Mounted in rear of bus facing forward		231		
Microphone		231		
Install Interface between contractor VR & the existing IVN Emergency Alarm (EA) Switch		231		
Cable		231		
Installation - 7-Camera System	N/A	231		
<b>7 - Camera Transit Bus Total</b>				\$0.00
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>De-Installation Existing Systems</b>				
De-Install 7-Camera Bus System	N/A	231		\$0.00
<b>Separately Priced Options</b>				
G-Force Sensor On Fixed Route Buses-Installed		231		\$0.00
Metadata (Brakes, Turn Signals, Flashers) On Fixed Route Bus - Installed		231		\$0.00
<b>Separately Priced Options- Subtotal</b>				\$0.00
<b>Warranty/Maintenance</b>				
Warranty/Maintenance 7-Camera Transit Bus (3-Year)		231		\$0.00
Item	Make/ Model	Qty	Unit Cost/Bus	Extended Cost
<b>Services</b>				
Engineering	N/A	1		\$0.00
## Manuals (M & O)	N/A	1		\$0.00
Training	N/A	1		\$0.00
<b>Services - Subtotal</b>				\$0.00
<b>PRICE SCHEDULE YEAR 4 - TOTAL PRICE</b>				\$0.00



BUS CCTV ONBOARD SURVEILLANCE SYSTEM - PRICE SCHEDULE - YEAR 5				
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>7-Camera Transit Bus</b>				
Video Recorder		270		
Removable Hard Drive		270		
## Solid State Drive (SSD)		108		##
Camera 1 Forward Facing Front Windshield		270		
Camera 2 View of Front Door & Farebox w/IR		270		
Camera 3 Mounted near front of bus with a front to rear view		270		
Camera 4 View of rear door & a portion of the rear seats		270		
Camera 5 External (outside) side view camera on curbside of bus		270		
Camera 6 External (outside) side view camera on streetside of bus		270		
Camera 7 Mounted in rear of bus facing forward		270		
Microphone		270		
Install Interface between contractor VR & the existing IVN Emergency Alarm (EA) Switch		270		
Cable		270		
Installation - 7-Camera System	N/A	270		
<b>7 - Camera Transit Bus Total</b>				\$0.00
Item	Make/ Model	Qty # Buses	Unit Cost/Bus	Extended Cost
<b>De-Installation Existing Systems</b>				
De-Install 7-Camera Bus System	N/A	270		\$0.00
<b>Separately Priced Options</b>				
G-Force Sensor On Fixed Route Buses-Installed		270		\$0.00
Metadata (Brakes, Turn Signals, Flashers) On Fixed Route Bus - Installed		270		\$0.00
<b>Separately Priced Options- Subtotal</b>				\$0.00
<b>Warranty/Maintenance</b>				
Warranty/Maintenance 7-Camera Transit Bus (3-Year)		270		\$0.00
Item	Make/ Model	Qty	Unit Cost/Bus	Extended Cost
<b>Services</b>				
Engineering	N/A	1		\$0.00
## Manuals (M & O)	N/A	1		\$0.00 ##
Training	N/A	1		\$0.00
<b>Services - Subtotal</b>				\$0.00
<b>PRICE SCHEDULE YEAR 5 - TOTAL PRICE</b>				\$0.00
<b>PRICE SCHEDULE YEARS 1, 2, 3, 4 and 5 - TOTAL EVALUATED PRICE</b>				\$0.00

- b. Best Value Determination
  - (1) The technical merit of the proposal is significantly more important than the price, and price must be fair and reasonable.
  - (2) The Authority may select other than the lowest price proposal if it is determined by value analysis, or technical/cost tradeoffs, that the proposal offers the greatest overall benefit to the Authority. As proposals become more technically equivalent, then price becomes more important.
- c. Offerors are advised that award may be made without discussion or any contact with the offerors concerning the offers received. Therefore, offers should be submitted initially on the most favorable terms that the offeror can submit to the Authority.
- d. Price evaluation will be based on the sum of the total prices.
- e. Affordability. The price proposals will be assessed for affordability. The Authority will not make an award for any proposal which proposes prices that would render the procurement infeasible.

**22. TECHNICAL PROPOSAL EVALUATION CRITERIA**

Each offeror's Technical Proposal will be evaluated against the following criteria listed in descending order of importance as follows:

**## Criterion 1 - Past Performance/Experience: (20%) ##**

Offeror must demonstrate in its proposal a minimum of seven (7) years of experience with installation of vehicle electrical systems which includes radio transmissions and GPS coordination.

Offeror must demonstrate in their proposal a minimum of seven (7) years of experience with successful installation of at least 100 over-the-road coaches/transit buses/school buses CCTV systems which includes DVR/NVR, or other state of the art Video Recording Devices, recordings with download capabilities to external sources, camera clarity, and integration to other required bus electrical/electronic systems/wireless networks.

Offeror must demonstrate in their proposal that they have successfully installed CCTV Systems on over-the-road coaches/transit buses/school buses at a minimum of three (3) similar contracts within the past seven (7) years, and it must include detailed information:

- (1) Name and address of Agency/Organization;
- (2) Name, Telephone number and email address of administrative contracting officer/program manager;
- (3) Brief description of the project, including project title and location;
- (4) Number of vehicles involved;
- (5) Contract Value;
- (6) Performance Period;

**## Criterion 2 - Sample Video: (20%)**

**##**

Offeror must provide a sample DVD/CD meeting the needs described in the Scope of Work, "Sample Video" section.

**Criterion 3- Technician Proficiency: (15%)**

Offeror must demonstrate that technicians performing work as required by the Scope of Work have the ability to perform the work with minimal supervision and at maximum proficiency. Technicians will have all required training, certification and licenses required to perform the work detailed in the Scope of Work.

Offeror must submit resumes of all technicians who will be working on the project. Technician resumes must include formal electrical or electronic training either through a technical training school, college, or military training; and references. References must include company's name and complete address, point of contact name, title and email address, telephone number, and list electrical and electronic licenses and certifications.

**Criterion 4 – Warranty: (10%)**

Offeror will demonstrate their ability to meet the needs detailed under the Warranty Program in the Scope of Work.

**Criterion 5 – Maintenance Agreement: (10%)**

Offeror will demonstrate their ability to meet the needs detailed under the Maintenance Agreement Program in the Scope of Work.

**Criterion 6 – Technical Data Sheets: (10%)**

Offeror's must submit all technical data sheets for each and every component being provided by the contractor for this project, and demonstrate in detail that the proposed CCTV System/Equipment meet the standard described in the Scope of Work.

Offeror's must provide as part of their submittal complete information as outlined in the tables within the Scope of Work to describe storage capacity, camera frame rates, etc. Offeror must demonstrate the information provided meets WMATA standards for CCTV equipment integration into a bus, VAN, WMATA LAN and any other interfaces with WMATA systems.

**Criterion 7 – Offeror's Agreement with Clever Devices: (10%)**

Offeror must provide WMATA with evidence that its equipment will be compatible with the broadcast services provided through Clever Devices' on board equipment and that the interface will not affect any current warranty/maintenance agreements in place between WMATA and Clever Devices.

**## Criterion 8 – Written Statement of CCTV Systems for Compatibility Testing: (5%) ##**

Offer's must provide in its technical proposal a written statement that the offeror agrees to provide WMATA with two (2) complete CCTV Systems for compatibility testing purposes at their own cost and at their cost for installation and removal.

**23. RATINGS FOR TECHNICAL PROPOSAL EVALUATION CRITERIA**

Each criterion will be rated using the Adjectival scoring method as follows:

Definition of Adjective Rankings:

Exceptional	Exceeds specified performance or capability in a beneficial way to WMATA, and has no weakness.
Acceptable	Meets evaluation standards required under the technical provisions. Weaknesses are correctable.
Marginal	Fails to meet evaluation standard; however any significant deficiencies are correctable. Lacks essential information to support a proposal.
Unacceptable	Fails to meet an acceptable evaluation standard and the deficiency is uncorrectable. Proposal would have to undergo a major revision to become acceptable. Demonstrated lack of understanding of WMATA's requirements or omissions of major areas.

A rating of "Acceptable" is required to be eligible for award consideration. Offeror is cautioned to be aware of this standard when preparing your Proposal.

**24. DEFINITIONS FOR TECHNICAL PROPOSAL EVALUATION**

Clarifications:	Communications with an offeror for the sole purpose of eliminating minor irregularities, informalities, or apparent clerical mistakes in the proposal. Unlike discussions, clarifications do not give the offeror an opportunity to revise or modify its proposal, except to the extent that correction of apparent clerical mistake results in revisions.
Discussions:	Oral or written communications including negotiations between the Authority and an offeror (other than clarifications) that; involves information essential for determining the acceptability of the proposal or to cure identified defects in the proposal.

The Contractor's work includes, but is not limited to, the following:

- A. Performing a complete installation of specified systems, subsystems, and components, including engineering interface with new equipment. Unless otherwise noted, this shall include the provision of all new or replacement components, consumables, disposables, and standard hardware by the Contractor, as necessary to complete the installation. The removal of existing CCTV equipment is necessary. Any old CCTV equipment shall be returned to WMATA.
- B. Performing detailed design for the system whole and in part related to equipment, engineering, manufacturing, and testing of system.
- C. Providing technical data, software, samples, and mock-ups for new items, as required.
- D. Performing qualification and acceptance testing.
- E. Providing training programs to the Authorities' operations and maintenance staff in the usage and maintenance of all new systems.
- F. Executing the preparation and configuration control of as-built drawings, material and process specifications, and all other engineering, design and manufacturing information required to present the final as-built design of the work as developed and approved. Providing vehicle configuration verification and drawing conversion as specified.
- G. Providing the Illustrated Parts Catalog and maintenance manual in a suitable electronic format to be used for updating the WMATA's existing Maximo Maintenance Reporting System.
- H. Updating maintenance and operational manuals and delivering completed inserts for manuals, parts lists, tool lists, and special tools lists, in the numbers specified. Update software on all equipment, as required.
- I. Providing special tools and diagnostic test equipment for new and upgraded systems.
- ## J. Administering Warranty Program.
- K. Administering Maintenance Program.
- L. Supporting WMATA's Safety Certification Program. ##

**WMATA-Furnished Facilities and Equipment**

WMATA will make available to the Contractor certain facilities and equipment at WMATA bus divisions shop and yard for support of acceptance testing and warranty. Specifically WMATA will provide the Contractor with the following:

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- ii. Cameras shall capture high quality video in various lighting conditions from bright sunshine with glare to low light conditions that occur on the bus at night.
- iii. All cameras shall be NTSC.
- iv. All cameras shall have internal synchronization
- v. All cameras shall be powered off of the VR power.
- vi. All cameras shall be mounted in a secure vandal-resistant housing, with either a key-lock design or tamper-proof screw design.
- vii. All cameras shall have automatic backlight compensation.
- viii. Camera 1 (Forward Facing Camera).
  - a. Camera 1 shall be mounted so as to have a view through the front windshield within the area that is covered by the windshield wipers. This camera shall be mounted so as not to come into contact with the rearview mirror at any time.
  - b. Camera 1 shall have a minimum resolution of 470 TV Lines (TVL)
  - c. Camera 1 shall be a color day/night camera (automatically switching from color to black/white in low-light conditions) with operation down to at least 0.3 Lux.
  - d. Camera 1 is preferred to have a varifocal lens with a range of at least 4-8mm.
- ix. Camera 2 (Front Door Camera).
  - a. Camera 2 shall be mounted so as to have a view of the front door, steps and farebox area. ##
  - b. Camera 2 shall have a minimum resolution of 470 TV Lines (TVL)
  - c. Camera 2 shall be a color day/night camera with infrared illumination (either through built-in IR illuminators, or a separate external IR illuminator) with operation down to 0.0 Lux.
- ## x. Cameras 5 & 6 (External Curb-Side & Street Side View Camera). ##
  - ## a. Cameras 5 & 6 shall be mounted on the outside (curb-side and street-side, respectively) of the bus, and shall have a sturdy design able to stand up against the normal external wear and tear of a bus due to tree branches, bus washes, etc. ##
  - ## b. Cameras 5 & 6 shall have a minimum resolution of 420 TV Lines (TVL). ##
  - ## c. Cameras 5 & 6 shall be a color day/night camera (automatically switching from color to black/white in low-light conditions) with operation down to at least 0.1 Lux. ##
  - ## d. Cameras 5 & 6 shall have a focal length appropriate for viewing the curb-side and street-side of the bus respectively. ##
- xi. Camera 9 (Rear View Camera – Articulated Buses).
  - a. Camera 9 shall be mounted on the outside (rear) of the bus, and shall have a sturdy design able to stand up against the normal external wear and tear of a bus due to tree branches, bus washes, etc.
  - b. Camera 9 shall have a minimum resolution of 420 TV Lines (TVL).
  - c. Camera 9 shall be a color day/night camera (automatically switching from color to black/white in low-light conditions) with operation down to at least 0.1 Lux.
  - d. Camera 9 shall have a wide-angle lens sufficient for providing at least a 90-degree angle of coverage.
- ## xii. Cameras 3,4,7,8 (All Cameras With Internal Bus Views). ##
  - a. These cameras shall be ceiling or wall mounted in the general area as outlined earlier in this SOW.
  - b. These cameras shall have a minimum resolution of 470 TV Lines (TVL).
  - c. These cameras shall be color day/night cameras (automatically switching from color to black/white in low-light conditions) with operation down to 0.1 Lux.
  - d. These cameras shall be available in focal lengths of between 2.9mm and 8.0mm.

- b. 1% of all buses will have an EA event on any given day
  - c. 1% of all buses will have a G-Force event on any given day
  - d. 2% of all buses will have to respond to a “Requested Video” query on any given day. This query will be (on average) 15 minutes in length.
  - ## e. All buses will upload “Health Check” data once a day to wayside (fixed end system).
    - 1. CCTV system shall report system faults and state of health information to existing external onboard monitoring system (Clever Devices AVM3®). Compatibility approval from Clever Devices should accompany proposal.
      - a. Communication shall be via SAE 1708/1587 or J1939 interfaces.
      - b. Faults shall be reported in real time, data upon request.
      - c. At a minimum, the following faults and data must be supported:
        - i. VR software version/revision identification.
        - ii. Backup battery status/state of health.
        - iii. System over/under voltage errors.
        - iv. System over temperature errors.
          - 1. Occurrence count / severity level.
        - v. Camera-specific faults.
          - 1. Obscured visibility.
          - 2. Loss of signal.
        - vi. Communication faults / upload errors.
          - 1. Wireless upload failure reports. ##
- f. The number of buses per division is as follows: (will be provided prior to project start)

DIVISIONS	ASSIGNMENTS						SCHEDULES				
	ACTUAL	MAX	STRA-				AM	PM	BASE	SAT	SUN
	BUSES	SKED	TEGIC	MAX		TOTAL	REG	REG	REG	MAX	MAX
	FLEET	FLEET	FLEET	SPARES	FLEET	FLEET	FLEET	FLEET	FLEET	FLEET	FLEET
BLADENSBURG											
NORTHERN											
SOUTHERN AVE											
WESTERN											
WEST OX											
FOUR MILE RUN											
LANDOVER											
MONTGOMERY											
SHEPARD PKWY											
SYSTEM TOTAL											

- g. Amount of available time for data upload from a bus is 30 minutes/day – includes 20 minute System Shutdown time.
- h. Up to 50% of buses can arrive in division at one time.

- i. Buses will not return to the division simultaneously, nor will they return in an evenly distributed fashion.
- ii. Contractor's "Requested Video" solution shall allow for an authorized Bus CCTV System user to setup a request for video anywhere from within the WMATA WAN.
- iii. Contractor shall be capable of reviewing stored video data from anywhere on the WMATA WAN, without having to identify a server location.
- iv. Video/audio/event/metadata shall be retrievable from any bus within range of a WMATA wireless access point.
- v. Video/audio/event/metadata shall be retrievable by a properly equipped WMATA Supervisor / Police vehicle within wireless range of any WMATA equipped Bus CCTV System.
- vi. The Contractor's design shall be reviewed by WMATA's IT Security group and must comply with WMATA's IT Security policies and procedures.
- vii. The VR shall be capable of operating on 24VDC power. It shall have an operating range of at least 11VDC – 42 VDC. All other on-board devices shall operate off of VR power.
- viii. The system shall be able to tolerate (without loss of data) power spikes and losses commonly found on a transit bus.
- ix. The system shall include a battery backup capability that will continue to power the Bus CCTV System as follows: Subsystem capable of sustaining full operation of the CCTV system including all VR functions and all connected cameras in the event of complete or partial power removal. CCTV system operation on battery power shall be configurable, to a minimum period of fifteen minutes, culminating automatically with an orderly (graceful) system shutdown. Backup battery subsystem shall explicitly prevent damage to any component or corruption of any system data caused by loss of supply voltage, whether complete or partial. Battery backup system shall automatically bridge power interruptions to the VR and cameras without damage, or interruption of video monitoring, collection, or storage. Re-charging of battery backup subsystem shall be automatic. Battery backup system state-of-health information shall be known to the VR and communicated with 'Health Check' requirements outlined elsewhere in this document.
- x. Contractors shall provide (as part of the proposal response) information as to the total power consumption that can be expected for both the Seven (7) Camera Bus and Nine (9) Camera Bus Configurations.
- xi. All Bus CCTV equipment, including all cables and connectors to and from the VR, shall be electrically protected to withstand low voltage, high voltage and electrical spikes resulting from jump-starting, or connection of external boosting or charging equipment to the bus electrical system.
- xii. The Contractor shall be responsible for any filters, power stabilizers, and other devices that protect the VR and other equipment from spikes, drops, and other power issues routinely experienced in a transit environment.
- xiii. The Contractor shall ensure that the Bus CCTV system fully performs as intended without being affected by, or causing interference to, other on-board systems. Protection shall be provided against radio frequency and electromagnetic interference (RFI/EMI) emission sources such as those produced by the bus RF radio system, 802.11 wireless from other onboard systems, etc.



- xiii. The system shall meet all applicable SAE J1455 “Equipment Environment Standards” for temperature, vibration, shock and humidity.
- xv. All CCTV camera enclosures shall be lockable (or have tamper proof screws), vandal and shock resistant, and made of a non-toxic material. Camera domes shall not fog up. Camera alignment shall be accomplished with mechanical fasteners that shall not be sent out of adjustment due to shock or vibration. Keys or tools to access these enclosures shall be provided to the Contracting Officer Technical Representative.
- xvi. WMATA has had considerable problems with existing cameras, where water leaks from the roof of the bus into roof mounted cameras causing camera malfunction or failure. For this reason, WMATA prefers internal cameras with a minimum rating of IP65, and external cameras with a minimum rating of IP66. Contractor shall state in their proposal the IP rating of all cameras. If the proposed camera does not have the WMATA preferred IP rating, or the camera’s IP rating is “Unknown”, then Contractor shall state in proposal what steps it plans on taking to eliminate water intrusion. In all cases, Contractor shall be responsible for the cost associated with replacing cameras that fail, even when that failure is due to water intrusion. Visible water accumulation within a camera or housing shall constitute a camera failure and be subject to no cost replacement, regardless of current operational status of the camera
- xvii. WMATA prefers a VR with an IP65 rating. Contractors shall provide (as part of their proposal response) the IP rating of the proposed VR.
- xviii. Contractors shall provide (as part of their proposal response) information regarding the environmental testing performed on each of the components. For any components that have not been tested, or where this information is unknown, simply state “Unknown”. Contractor shall be prepared to provide official test results for each of the following environmental tests upon request from WMATA.

### **Vehicle Installation and Cable Requirements**

The WMATA Bus CCTV Onboard equipment shall meet the following installation standards and requirements:

- i. The Contractor shall perform all Transit Vehicle equipment and software installation outlined in this SOW unless otherwise noted.
- ii. Two phases of installation are outlined in this Scope of Work. They include the following:
  - a. **Pilot Vehicle Installation:** The Contractors that make the proposal evaluation short list will be invited to install two transit buses with their Bus CCTV System solution, as well as integrate the systems with the WMATA WLAN. One set of equipment will be evaluated in the WMATA IT laboratory prior to installation on the bus. These Pilot Vehicle installations will be evaluated over a 30 day test period and results will be used as part of the final Contractor selection.
  - b. **Fleet Installation:** Once the Pilot Phase is complete, one Contractor will be authorized to perform installations on the remainder of the fleet.
- iii. Installation Hours: WMATA will allow the Contractor to perform installations Monday thru Friday between the hours of 7:00 AM and 3:00 PM. WMATA will also consider occasional weekend hours if needed.

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- iv. WMATA will provide two buses per day for installation at one of WMATA's Bus Divisions.
- v. The Contractor is responsible to provide and install all cable, brackets, and other associated materials necessary to complete the installation.
- vi. It is the responsibility of the Contractor to remove without damage and transfer to WMATA any existing Bus CCTV equipment prior to beginning installation of the new equipment. COTR will inspect removed equipment and issue receipt. Contractor will be responsible for providing bus-specific receipt of removed equipment on demand of COTR.
- vii. All equipment shall be installed so as to allow easy access to the equipment for maintenance purposes.
- viii. All VR, hard drive, camera, GPS and G-Force equipment shall be identified by a permanently affixed part number and serial number.
- ix. Prior to beginning Pilot installations, the Contractor shall be responsible for making recommendations for the location of equipment, and for providing this information in written form to WMATA. WMATA shall have final approval for the placement of all equipment prior to installation.
- x. Bus CCTV equipment including the VR, cameras, hard drives, GPS, and optional G-Force shall be removable/replaceable as a single unit. If components such as the wireless and/or G-Force are embedded in the VR, then they shall be easily replaceable within 24 hours of failure diagnosis, without having to replace the entire VR. Work shall be performed by qualified personnel.
- xi. All connectors on back of all installed equipment shall be hidden from the view of all non-authorized personnel.
- xii. All Bus CCTV equipment (other than cameras, microphone and antennas) shall be contained in a secure lockable cabinet. Some buses have existing lockable cabinets that can be used if there is sufficient space available. For buses without these cabinets, the Contractor shall be responsible for providing the cabinets and keys. All cabinets provided by the Contractor shall be keyed alike. Contractor shall provide 25 copies each of any key required to access any installed equipment to COTR.
- xiii. Contractor supplied cabinets shall be mounted out of the way of the riding public and bus operator. The location of all installed equipment, including enclosures, shall be submitted for approval to the COTR prior to installation.
- xiv. When performing installations, the Contractor shall take care to avoid damage to both the newly installed and existing wiring and equipment. Any damage to the vehicle, other components on the vehicle, or newly installed equipment, as determined by WMATA, shall be the responsibility of the Contractor to correct. The decision of the COTR is final.
- xv. Prior to beginning installation of equipment on any bus, the Contractor shall document (in a pre-installation checklist) any significant damage that is pre-existing on that vehicle. Upon completion of the installation, the Contractor shall ensure that the bus is returned in the same condition as it was found prior to installation. A post installation inspection will also occur. Both the pre and post installation checklists will be reviewed with WMATA inspectors prior to WMATA inspectors accepting any claims or signing off on any work.

- xvi. All wiring connections of Contractor installed equipment to WMATA bus shall be submitted to and approved by COTR prior to commencing any work. Connections shall be made with mechanical connectors specifically designed for heavy-duty automotive applications. All wiring and connectors shall be installed in strict adherence to standard installation practices and to federal, state or local applicable codes. If the Contractor installs wiring or cabling, the Contractor shall be fully responsible for correcting any defective installation and repairing any damage caused by the installation, at no additional cost to WMATA. The decision of the WMATA COTR is final as to determination of responsibility.
- xvii. All Bus CCTV equipment that requires mounting in the bus shall be through-mounted with lock nuts to assure that each piece of equipment is properly secured. No sheet metal screws shall be allowed for equipment mounting and installation.
- xviii. Prior to beginning work, the Contractor shall submit wiring and cabling, installation and routing product information to WMATA for review and approval.
- xix. All wiring shall be multi-strand, flame retardant and made of flexible material.
- xx. All connectors shall have a locking design. If any bare-wire or plug-in connectors are required, they shall be installed with soldered sleeves.
- xxi. No crimp style connectors, T-Taps or butt connectors shall be used.
- xxii. All cable shall be of a single continuous piece, and shall not be spliced together or be the combination of multiple shorter cable lengths.
- xxiii. All wire and insulation shall be sized based on the current carrying capability, voltage drop, mechanical strength, temperature and flexibility requirements.
- xxiv. The cable utilized for power shall be sized appropriately based on the power requirements of the Bus CCTV equipment and power source utilized, and be approved by WMATA COTR.
- xxv. All cable shall be appropriately tagged, and be of consistent color coding across all vehicles installed. All cabling documentation provided shall reference the color coding used.
- xxvi. All cable shall be prefabricated into standardized harnesses specific to the applicable bus for connection with components at both ends. Long lengths of extra wire or harnessing will not be permitted.
- xxvii. All cable shall be bundled and secured with nylon tie wraps at least every eighteen inches. Tie wraps shall be cut at ninety degrees, perpendicular to latch, to prevent injury to future service personnel.
- xxviii. Video, audio, wireless and other equipment cable shall be properly shielded to avoid such issues as signal loss and/or interference with other onboard equipment. The Contractor shall be responsible for ensuring there is no interference with other onboard equipment, and for the relocation or additional shielding required if unacceptable interference or signal loss occurs.
- xxix. Cable fastenings, supports, and hangers shall be adequate to support their loads and meet transit usage.
- xxx. Whenever cable is passed through a hole created in a solid surface, the Contractor shall install a protective plastic or rubber grommet, durable, appropriate to the mobile environment, approved by COTR, to ensure there will not be chaffing or cutting of the wire over time.
- xxxi. Contractors shall include at least an additional 18" service loop at each end of cables.

- xxxii. Cables fed through the articulated portion of a bus shall include sufficient length and protection to ensure the safe movement of this cable within that area. All cable routings and attachments shall be standardized to each bus type, and be approved by COTR.
- xxxiii. Contractor shall provide WMATA with at least 3 sets per division of any special tools required for removal/replacement of equipment.
- xxxiv. Contractor shall be responsible for installation, configuration and testing of all initial software and software updates/upgrades/patches on the Transit Buses and Supervisor / Police vehicles. Software changes shall be submitted to WMATA IT-APPS Change Review Board via COTR for approval prior to deployment.
- xxxv. Contractor responsible for installation of all initial software, as well as software updates/patches required during the warranty or maintenance periods.
- xxxvi. Software updates shall not require the removal of any Bus CCTV equipment.

**Fixed End Installation Requirements**

The Contractor shall provide all Back Office installation services to meet the following specifications:

- i. Perform initial software installation on WMATA-designated workstations.
- ii. Perform software configuration at WMATA’s direction.
- iii. Perform informal knowledge transfer during the installation to designated WMATA personnel.
- iv. Verify and validate all required software installations and workstation configurations
- v. Perform initial software installation on a WMATA-designated server
- vi. Perform software configuration at WMATA’s direction.
- vi. Perform informal knowledge transfer during the installation to designated WMATA personnel.
- viii. Verify and validate all required server software installations and server configurations.

Component	Operating Temp. Range	Storage Temp. Range	Humidity	Operating Vibration	Operating Shock	IP Rating
VR						
Removable Hard Drive						
Camera 1						
Camera 2						
...						
Camera 9						
Wireless						
GPS						
G-Force						

### **Contractor Short-List and Pilot Demonstration Phase**

The top three offerors meeting the short-list will be invited to install two revenue vehicles with their system, and integrate the mobile systems with the WMATA wireless LAN. The shortlisted offerors will have ten (10) business days after notification to provide the two (2) systems for testing and installation. Following installation, selected WMATA and WMATA consulting staff will be trained in the operation of the systems.

The WMATA staff will perform thirty (30) days of functional testing of the shortlisted systems. At the end of/during the course of this phase, oral interviews may be held with the shortlisted Contractors. Part of these interviews will be feedback from WMATA staff on deficiencies and any other issues identified during the Pilot Demonstration. Contractors will then be asked to provide a best and final offer, including a plan to address each issue/deficiency.

WMATA will award to the Contractor who scores best on a combined Technical and Price evaluation.

### **Warranty and Maintenance Support**

**General:** The rights and remedies of WMATA under this Part are not intended to be exclusive and shall not preclude the exercise of any other rights or remedies provided for in this specification, or by any subsequent contract, or by law or otherwise.

**Warranty:** The Contractor shall warrant that all goods supplied, systems, equipment, designs, and work covered by this Scope of Work and subsequent contract shall be satisfactory for its intended purpose, shall conform to and perform as called for in the Contract requirements specifications and shall be free from all defects and faulty materials and workmanship. Any goods supplied, systems, equipment, designs, or work found to be defective within the time specified below shall be repaired, remedied, or replaced, hereinafter called "corrective work", by the Contractor, free of all charges including transportation.

- ## i. The warranty period for all Contractor-provided goods supplied, systems, and equipment shall extend to thirty-six (36) months after Final Acceptance.
- ii. The Contractor shall provide the formal signed warranty(s) no later than ninety (90) days after the placement into operation of the first accepted unit.
- iii. Replacement parts and repairs provided, pursuant to corrective work hereunder, shall be subject to prior approval by WMATA and shall be tendered and performed in the same manner and extent as items originally delivered in accordance with this SOW. All replacement equipment will be new. No refurbished equipment is acceptable to WMATA. ##

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**Maintenance Agreement:** The Contractor's proposal for the Bus CCTV system solution shall include a Maintenance Agreement for all hardware and software provided by this SOW. The Contractor shall provide written maintenance agreement subject to WMATA approval and must include the following terms and conditions:

- i. Terms of the maintenance agreements shall begin for all Contractor-provided goods supplied, systems, equipment, designs, and work covered by this Scope of Work following acceptance of each Bus CCTV system.
- ii. Provide all labor, tools, parts and materials necessary to maintain in proper working order all provided goods supplied, systems, equipment, designs, and work provided by this Scope of Work for its intended purpose. This shall include labor and tools during the Warranty period.
- iii. Provide forty-eight (48) hour corrective action response time, from notice to completion of repairs, to restore all Contractor-provided goods supplied, systems, equipment, designs, and work covered by this Scope of Work.
- iv. Provide liquidated damages to WMATA as consideration for the failure of Contractor to provide the forty-eight (48) hours corrective action response. Liquidated damages shall be the cost for WMATA to perform the corrective action themselves.
- v. Fully exercise all warranty provisions afforded by this Scope of Work for the benefit of WMATA.
- vi. Provide coordination of Contractor supplier to maintain in proper working order all provided goods supplied, systems, equipment, designs, and work provided by this Scope of Work for its intended purpose, shall conform to and perform as called for any necessary updates and corrective actions necessary to ensure current up-to-date revisions and service bulletins from component Contractors.
- vii. Comply with all WMATA work standards, rules, and regulations while on WMATA property including any FTA Substance testing requirements.
- viii. Replacement parts and repairs provided, pursuant to corrective work hereunder, shall be subject to prior approval by WMATA and shall be tendered and performed in the same manner and extent as items originally delivered in accordance with this SOW.
- ix. Provide formal report of corrective action suitable for complete entry in the MAXIMO maintenance reporting, or any other format subject to approval by WMATA.
- x. Provide off-site storage tools, parts, and materials.
- xi. Cooperate with WMATA and subsequent Contractor in good faith effort in the event of maintenance contract termination and provide full cooperation during transition to subsequent maintenance provider including corrective action response requirements.

### Training

The Contractor is to provide 40 hours of training annually for operations and maintenance staff in the usage and maintenance of all new systems.

**BUS CCTV On-Board Surveillance System**  
**RFP No. FQ15186/RSC**



**Bus Based Network Connection**

To provide network transport for incident video uploads and to provide network access to the bus based video system, a 10/100 Ethernet port is available on the on board bus router. When a bus is located at a bus garage, the bus connects to the WMATA network using an 802.11n connection. This connection is shared by multiple devices. The following paragraphs explain how this connection is shared and the resulting restrictions.

To direct incoming data to the appropriate device, port forwarding is utilized. This is necessary because the bus has a single IP address to the greater network as it is a single client on the wireless LAN. Hence, this requires all applications to have flexibility with port assignments for all communications to and from the bus based devices.

The following is a summary of the requirements for network communication through the on board router:

- Multicast is not permitted.
- Certain ports are in use for current devices/applications and cannot be used for this project. All devices/applications must have the flexibility to assign unique port numbers for all data services and protocols utilized.
- Buses should not be identified by IP addresses or MAC addresses to the host applications/servers. The on board equipment must be identified to the host at a higher layer.

The following diagram illustrates the on board network. Note that all IP addressing and port assignments shown are for illustration only. Actual port assignments and network addressing will be shared with the pilot finalists after applicable NDA/confidentiality documents are signed.

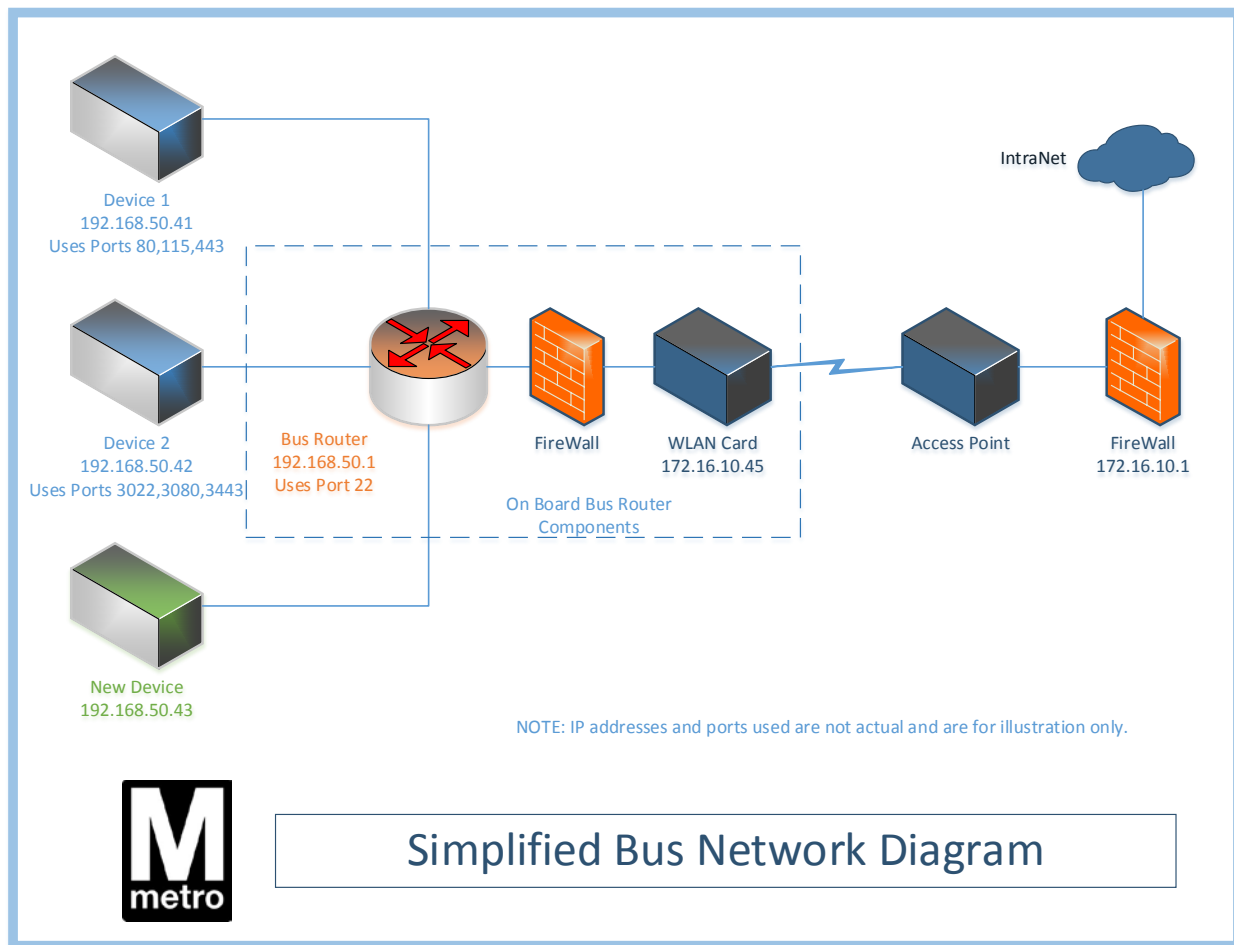
The on board router has several components including a firewall, router, wireless network card and switch. The router's firewall treats the inside the bus subnet as the trusted side and allows all outgoing traffic by default. Inbound traffic is blocked by default so traffic originating from outside of the bus will need to be allowed by the firewall and also port forwarded to the appropriate internal device.

### Bus Based Network Connection

The following is an example of inbound traffic. Please refer to the Simplified Bus Network Diagram below.

To send traffic to Device 1 from the authority’s intranet using TCP port 80, packets would be sent to the bus address, which is currently 172.16.10.45. To facilitate inbound traffic, the on board router would require a rule permitting inbound traffic on TCP port 80 and another rule forwarding TCP port 80 traffic to Device 1 at its IP address, 192.168.50.41. This would then preclude other device from using port 80.

Outbound traffic would not be blocked and responses would be returned to the sending device provided it was not using a port that has a rule forwarding it to another device.





### **Bus Based Network Connection**

The bus based CCTV device will connect to an available Ethernet port on the bus router. It cannot use any TCP or UDP ports used by existing devices. It also must also be discovered and identified without using the IP address or MAC address of the devices. On board router configurations are not customized with static addresses as this would affect maintenance procedures. The on board routers may also be swapped for maintenance at any time which should not trigger a CCTV device configuration change. The CCTV device will have a common IP address on the buses local area network so that all firewall rules will be identical throughout the fleet.