



THE CITY OF WINNIPEG

BID OPPORTUNITY

BID OPPORTUNITY NO. 545-2017

**SUPPLY AND DELIVERY OF TRANSPORTATION MANAGEMENT CENTRE AUDIO
VISUAL SOFTWARE LICENSES**

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PART B - BIDDING PROCEDURES

B1. CONTRACT TITLE

B1.1 SUPPLY AND DELIVERY OF TRANSPORTATION MANAGEMENT CENTRE AUDIO VISUAL SOFTWARE LICENSES

B2. SUBMISSION DEADLINE

B2.1 The Submission Deadline is 4:00 p.m. Winnipeg time, July 6, 2017.

B2.2 Bids determined by the Manager of Materials to have been received later than the Submission Deadline will not be accepted and will be returned upon request.

B2.3 The Contract Administrator or the Manager of Materials may extend the Submission Deadline by issuing an addendum at any time prior to the time and date specified in B2.1.

B3. ENQUIRIES

B3.1 All enquiries shall be directed to the Contract Administrator identified in D5.1.

B3.2 If the Bidder finds errors, discrepancies or omissions in the Bid Opportunity, or is unsure of the meaning or intent of any provision therein, the Bidder shall promptly notify the Contract Administrator of the error, discrepancy or omission at least five (5) Business Days prior to the Submission Deadline.

B3.3 If the Bidder is unsure of the meaning or intent of any provision therein, the Bidder should request clarification as to the meaning or intent prior to the Submission Deadline.

B3.4 Responses to enquiries which, in the sole judgment of the Contract Administrator, require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator to all Bidders by issuing an addendum.

B3.5 Responses to enquiries which, in the sole judgment of the Contract Administrator, do not require a correction to or a clarification of the Bid Opportunity will be provided by the Contract Administrator only to the Bidder who made the enquiry.

B3.6 The Bidder shall not be entitled to rely on any response or interpretation received pursuant to B3 unless that response or interpretation is provided by the Contract Administrator in writing.

B4. CONFIDENTIALITY

B4.1 Information provided to a Bidder by the City or acquired by a Bidder by way of further enquiries or through investigation is confidential. Such information shall not be used or disclosed in any way without the prior written authorization of the Contract Administrator. The use and disclosure of the confidential information shall not apply to information which:

- (a) was known to the Bidder before receipt hereof; or
- (b) becomes publicly known other than through the Bidder; or
- (c) is disclosed pursuant to the requirements of a governmental authority or judicial order.

B4.2 The Bidder shall not make any statement of fact or opinion regarding any aspect of the Bid Opportunity to the media or any member of the public without the prior written authorization of the Contract Administrator.

B5. ADDENDA

- B5.1 The Contract Administrator may, at any time prior to the Submission Deadline, issue addenda correcting errors, discrepancies or omissions in the Bid Opportunity, or clarifying the meaning or intent of any provision therein.
- B5.2 The Contract Administrator will issue each addendum at least two (2) Business Days prior to the Submission Deadline, or provide at least two (2) Business Days by extending the Submission Deadline.
- B5.2.1 Addenda will be available on the Bid Opportunities page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/bidopp.asp>
- B5.2.2 The Bidder is responsible for ensuring that he/she has received all addenda and is advised to check the Materials Management Division website for addenda regularly and shortly before the Submission Deadline, as may be amended by addendum.
- B5.3 The Bidder shall acknowledge receipt of each addendum in Paragraph 8 of Form A: Bid. Failure to acknowledge receipt of an addendum may render a Bid non-responsive.

B6. SUBSTITUTES

- B6.1 The Work is based on the Plant, Materials and methods specified in the Bid Opportunity.
- B6.2 Substitutions shall not be allowed unless application has been made to and prior approval has been granted by the Contract Administrator in writing.
- B6.3 Requests for approval of a substitute will not be considered unless received in writing by the Contract Administrator at least five (5) Business Days prior to the Submission Deadline.
- B6.4 The Bidder shall ensure that any and all requests for approval of a substitute:
- (a) provide sufficient information and details to enable the Contract Administrator to determine the acceptability of the Plant, Material or method as either an approved equal or alternative;
 - (b) identify any and all changes required in the applicable Work, and all changes to any other Work, which would become necessary to accommodate the substitute;
 - (c) identify any anticipated cost or time savings that may be associated with the substitute;
 - (d) certify that, in the case of a request for approval as an approved equal, the substitute will fully perform the functions called for by the general design, be of equal or superior substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract;
 - (e) certify that, in the case of a request for approval as an approved alternative, the substitute will adequately perform the functions called for by the general design, be similar in substance to that specified, is suited to the same use and capable of performing the same function as that specified and can be incorporated into the Work, strictly in accordance with the Contract.
- B6.5 The Contract Administrator, after assessing the request for approval of a substitute, may in his/her sole discretion grant approval for the use of a substitute as an “approved equal” or as an “approved alternative”, or may refuse to grant approval of the substitute.
- B6.6 The Contract Administrator will provide a response in writing, at least two (2) Business Days prior to the Submission Deadline, to the Bidder who requested approval of the substitute.
- B6.6.1 The Contract Administrator will issue an Addendum, disclosing the approved materials, equipment, methods and products to all potential Bidders. The Bidder requesting and

obtaining the approval of a substitute shall be responsible for disseminating information regarding the approval to any person or persons he/she wishes to inform.

- B6.7 If the Contract Administrator approves a substitute as an “approved equal”, any Bidder may use the approved equal in place of the specified item.
- B6.8 If the Contract Administrator approves a substitute as an “approved alternative”, any Bidder bidding that approved alternative may base his/her Total Bid Price upon the specified item but may also indicate an alternative price based upon the approved alternative. Such alternatives will be evaluated in accordance with B15.
- B6.9 No later claim by the Contractor for an addition to the Total Bid Price because of any other changes in the Work necessitated by the use of an approved equal or an approved alternative will be considered.

B7. BID SUBMISSION

- B7.1 The Bid shall consist of the following components:
- (a) Form A: Bid; and
 - (b) Form B: Prices.
- B7.2 Further to B7.1, the Bidder should include the written correspondence from the Contract Administrator approving a substitute in accordance with B6.
- B7.3 All components of the Bid shall be fully completed or provided, and submitted by the Bidder no later than the Submission Deadline, with all required entries made clearly and completely.
- B7.4 Bidders are advised not to include any information/literature except as requested in accordance with B7.1.
- B7.5 Bidders are advised that inclusion of terms and conditions inconsistent with the Bid Opportunity document, including the General Conditions, will be evaluated in accordance with B15.1(a).
- B7.6 The Bid may be submitted by mail, courier or personal delivery, or by facsimile transmission.
- B7.7 If the Bid is submitted by mail, courier or personal delivery, it shall be enclosed and sealed in an envelope clearly marked with the Bid Opportunity number and the Bidder's name and address, and shall be submitted to:
- The City of Winnipeg
Corporate Finance Department
Materials Management Division
185 King Street, Main Floor
Winnipeg MB R3B 1J1
- B7.7.1 Samples or other components of the Bid which cannot reasonably be enclosed in the envelope may be packaged separately, but shall be clearly marked with the Bid Opportunity number, the Bidder's name and address, and an indication that the contents are part of the Bidder's Bid Submission.
- B7.8 If the Bid is submitted by facsimile transmission, it shall be submitted to 204 949-1178
- B7.8.1 The Bidder is advised that the City cannot take responsibility for the availability of the facsimile machine at any time.
- B7.9 Bids submitted by internet electronic mail (e-mail) will not be accepted.

B8. BID

- B8.1 The Bidder shall complete Form A: Bid, making all required entries.

B8.2 Paragraph 2 of Form A: Bid shall be completed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, his/her name shall be inserted;
- (b) if the Bidder is a partnership, the full name of the partnership shall be inserted;
- (c) if the Bidder is a corporation, the full name of the corporation shall be inserted;
- (d) if the Bidder is carrying on business under a name other than his/her own, the business name and the name of every partner or corporation who is the owner of such business name shall be inserted.

B8.2.1 If a Bid is submitted jointly by two or more persons, each and all such persons shall identify themselves in accordance with B8.2.

B8.3 In Paragraph 3 of Form A: Bid, the Bidder shall identify a contact person who is authorized to represent the Bidder for purposes of the Bid.

B8.4 Paragraph 10 of Form A: Bid shall be signed in accordance with the following requirements:

- (a) if the Bidder is a sole proprietor carrying on business in his/her own name, it shall be signed by the Bidder;
- (b) if the Bidder is a partnership, it shall be signed by the partner or partners who have authority to sign for the partnership;
- (c) if the Bidder is a corporation, it shall be signed by its duly authorized officer or officers and the corporate seal, if the corporation has one, should be affixed;
- (d) if the Bidder is carrying on business under a name other than his/her own, it shall be signed by the registered owner of the business name, or by the registered owner's authorized officials if the owner is a partnership or a corporation.

B8.4.1 The name and official capacity of all individuals signing Form A: Bid should be printed below such signatures.

B8.5 If a Bid is submitted jointly by two or more persons, the word "Bidder" shall mean each and all such persons, and the undertakings, covenants and obligations of such joint Bidders in the Bid and the Contract, when awarded, shall be both joint and several.

B9. PRICES

B9.1 The Bidder shall state a price in Canadian funds for each item of the Work identified on Form B: Prices.

B9.1.1 Notwithstanding C11.1.3, prices on Form B: Prices shall not include the Goods and Services Tax (GST) or Manitoba Retail Sales Tax (MRST, also known as PST), which shall be extra where applicable.

B9.2 The quantities listed on Form B: Prices are to be considered approximate only. The City will use said quantities for the purpose of comparing Bids.

B9.3 The quantities for which payment will be made to the Contractor are to be determined by the Work actually performed and completed by the Contractor, to be measured as specified in the applicable Specifications.

B9.4 Payments to Non-Resident Contractors are subject to Non-Resident Withholding Tax pursuant to the Income Tax Act (Canada).

B10. DISCLOSURE

B10.1 Various Persons provided information or services with respect to this Work. In the City's opinion, this relationship or association does not create a conflict of interest because of this full

disclosure. Where applicable, additional material available as a result of contact with these Persons is listed below.

B10.2 The Persons are:

- (a) Barco Visual Solutions Inc.

B11. QUALIFICATION

B11.1 The Bidder shall:

- (a) undertake to be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Bidder does not carry on business in Manitoba, in the jurisdiction where the Bidder does carry on business; and
- (b) be financially capable of carrying out the terms of the Contract; and
- (c) have all the necessary experience, capital, organization, and equipment to perform the Work in strict accordance with the terms and provisions of the Contract.

B11.2 The Bidder and any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) be responsible and not be suspended, debarred or in default of any obligations to the City. A list of suspended or debarred individuals and companies is available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/debar.stm>

B11.3 The Bidder and/or any proposed Subcontractor (for the portion of the Work proposed to be subcontracted to them) shall:

- (a) have successfully carried out work similar in nature, scope and value to the Work; and
- (b) be fully capable of performing the Work required to be in strict accordance with the terms and provisions of the Contract; and
- (c) have a written workplace safety and health program, if required, pursuant to The Workplace Safety and Health Act (Manitoba);
- (d) be an authorized supplier for the software licenses requested for utilization of the TMC AV system
- (e) shall have direct experience within the past two (2) years with a minimum of three (3) similar projects which have used the same AV software and hardware integration currently utilized within the TMC.

B11.4 The Bidder shall submit, within three (3) Business Days of a request by the Contract Administrator, proof satisfactory to the Contract Administrator of the qualifications of the Bidder and of any proposed Subcontractor.

B11.5 The Bidder shall provide, on the request of the Contract Administrator, full access to any of the Bidder's equipment and facilities to confirm, to the Contract Administrator's satisfaction, that the Bidder's equipment and facilities are adequate to perform the Work.

B12. OPENING OF BIDS AND RELEASE OF INFORMATION

B12.1 Bids will not be opened publicly.

B12.2 Following the Submission Deadline, the names of the Bidders and their Total Bid Prices (unevaluated, and pending review and verification of conformance with requirements) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

B12.3 After award of Contract, the name(s) of the successful Bidder(s) and the Contract amount(s) will be available on the Closed Bid Opportunities (or Public/Posted Opening & Award Results) page at The City of Winnipeg, Corporate Finance, Materials Management Division website at <http://www.winnipeg.ca/matmgt/>

B12.4 The Bidder is advised that any information contained in any Bid may be released if required by The Freedom of Information and Protection of Privacy Act (Manitoba), by other authorities having jurisdiction, or by law or by City policy or procedures (which may include access by members of City Council).

B13. IRREVOCABLE BID

B13.1 The Bid(s) submitted by the Bidder shall be irrevocable for the time period specified in Paragraph 9 of Form A: Bid.

B13.2 The acceptance by the City of any Bid shall not release the Bids of the next two lowest evaluated responsive Bidders and these Bidders shall be bound by their Bids on such Work for the time period specified in Paragraph 9 of Form A: Bid.

B14. WITHDRAWAL OF BIDS

B14.1 A Bidder may withdraw his/her Bid without penalty by giving written notice to the Manager of Materials at any time prior to the Submission Deadline.

B14.1.1 Notwithstanding C22.5, the time and date of receipt of any notice withdrawing a Bid shall be the time and date of receipt as determined by the Manager of Materials.

B14.1.2 The City will assume that any one of the contact persons named in Paragraph 3 of Form A: Bid or the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid, and only such person, has authority to give notice of withdrawal.

B14.1.3 If a Bidder gives notice of withdrawal prior to the Submission Deadline, the Manager of Materials will:

- (a) retain the Bid until after the Submission Deadline has elapsed;
- (b) open the Bid to identify the contact person named in Paragraph 3 of Form A: Bid and the Bidder's authorized representatives named in Paragraph 10 of Form A: Bid; and
- (c) if the notice has been given by any one of the persons specified in B14.1.3(b), declare the Bid withdrawn.

B14.2 A Bidder who withdraws his/her Bid after the Submission Deadline but before his/her Bid has been released or has lapsed as provided for in B13.2 shall be liable for such damages as are imposed upon the Bidder by law and subject to such sanctions as the Chief Administrative Officer considers appropriate in the circumstances. The City, in such event, shall be entitled to all rights and remedies available to it at law.

B15. EVALUATION OF BIDS

B15.1 Award of the Contract shall be based on the following bid evaluation criteria:

- (a) compliance by the Bidder with the requirements of the Bid Opportunity, or acceptable deviation therefrom (pass/fail);
- (b) qualifications of the Bidder and the Subcontractors, if any, pursuant to B11 (pass/fail);
- (c) Total Bid Price;
- (d) economic analysis of any approved alternative pursuant to B6;

B15.2 Further to B15.1(a), the Award Authority may reject a Bid as being non-responsive if the Bid is incomplete, obscure or conditional, or contains additions, deletions, alterations or other

irregularities. The Award Authority may reject all or any part of any Bid, or waive technical requirements or minor informalities or irregularities if the interests of the City so require.

B15.3 Further to B15.1(b), the Award Authority shall reject any Bid submitted by a Bidder who does not demonstrate, in his/her Bid or in other information required to be submitted, that he/she is responsible and qualified.

B15.4 Further to B15.1(c), the Total Bid Price shall be the sum of the quantities multiplied by the unit prices for each item shown on Form B: Prices.

B15.5 This Contract will be awarded as a whole.

B16. AWARD OF CONTRACT

B16.1 The City will give notice of the award of the Contract or will give notice that no award will be made.

B16.2 The City will have no obligation to award a Contract to a Bidder, even though one or all of the Bidders are determined to be responsible and qualified, and the Bids are determined to be responsive.

B16.2.1 Without limiting the generality of B16.2, the City will have no obligation to award a Contract where:

- (a) the prices exceed the available City funds for the Work;
- (b) the prices are materially in excess of the prices received for similar work in the past;
- (c) the prices are materially in excess of the City's cost to perform the Work, or a significant portion thereof, with its own forces;
- (d) only one Bid is received; or
- (e) in the judgment of the Award Authority, the interests of the City would best be served by not awarding a Contract.

B16.3 Where an award of Contract is made by the City, the award shall be made to the responsible and qualified Bidder submitting the lowest evaluated responsive Bid in accordance with B15.

B16.3.1 Following the award of contract, a Bidder will be provided with information related to the evaluation of his/her Bid upon written request to the Contract Administrator.

B16.4 Notwithstanding C4.1, the City may issue a purchase order to the successful Bidder in lieu of the execution of a Contract.

B16.5 The Contract Documents, as defined in C1.1(n)(ii), in their entirety shall be deemed to be incorporated in and to form a part of the purchase order notwithstanding that they are not necessarily attached to or accompany said purchase order.

PART C - GENERAL CONDITIONS

C0. GENERAL CONDITIONS

- C0.1 The *General Conditions for Supply of Services* (Revision 2007 04 12) are applicable to the Work of the Contract.
- C0.1.1 The *General Conditions for Supply of Services* are available on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division website at http://www.winnipeg.ca/matmgt/gen_cond.stm
- C0.2 A reference in the Bid Opportunity to a section, clause or subclause with the prefix “**C**” designates a section, clause or subclause in the *General Conditions for Supply of Services*.

PART D - SUPPLEMENTAL CONDITIONS

GENERAL

D1. GENERAL CONDITIONS

D1.1 In addition to the *General Conditions for Supply of Services*, these Supplemental Conditions are applicable to the Work of the Contract.

D2. SCOPE OF WORK

D2.1 The Work to be done under the Contract shall consist of the supply and delivery of Transportation Management Centre Audio Visual System software licenses for the period from date of award until June 30, 2018, with the option of one (1) mutually agreed upon one (1) year extension.

D2.1.1 The City may negotiate the extension option with the Contractor within ninety (90) Calendar Days prior to the expiry date of the Contract. The City shall incur no liability to the Contractor as a result of such negotiations.

D2.1.2 Changes resulting from such negotiations shall become effective on July 1st of the respective year. Changes to the Contract shall not be implemented by the Contractor without written approval by the Contract Administrator.

D2.2 The Work shall be done on an "as required" basis during the term of the Contract.

D2.2.1 The type and quantity of Work to be performed under this Contract shall be as authorized from time to time by the Contract Administrator and/or Users.

D2.2.2 Notwithstanding C7.4, the City shall have no obligation under the Contract to purchase any quantity of any item in excess of its actual operational requirements.

D2.3 Notwithstanding D2.1, the type and quantity of Work to be performed under this Contract is subject to annual approval of monies therefore in a budget by Council. Proponents are advised that monies have been approved for work up to and including December 31, 2017.

D2.4 Notwithstanding D2.1, in the event that operational changes result in substantial changes to the requirements for Work, the City reserves the right to alter the type or quantity of work performed under this Contract, or to terminate the Contract, upon thirty (30) Calendar Days written notice by the Contract Administrator. In such an event, no claim may be made for damages on the ground of loss of anticipated profit on Work.

D3. COOPERATIVE PURCHASE

D3.1 The Contractor is advised that this is a cooperative purchase.

D3.2 The Contract Administrator may, from time to time during the term of the Contract, may approve other public sector organizations and utilities, including but not limited to municipalities, universities, schools and hospitals, to be participants in the cooperative purchase.

D3.3 The Contract Administrator will notify the Contractor of a potential participant and provide a list of the delivery locations and estimated quantities.

D3.4 If any location of the potential participant is more than ten (10) kilometers beyond the boundaries of The City of Winnipeg, the Contractor shall, within fifteen (15) Calendar Days of the written notice, notify the Contract Administrator of the amount of any additional delivery charge for the location.

D3.5 If any additional delivery charges are identified by the Contractor, the potential participant may accept or decline to participate in the cooperative purchase.

- D3.6 The Contractor shall enter into a contract with each participant under the same terms and conditions as this Contract except:
- (a) supply under the contract shall not commence until the expiry or lawful termination of any other contract(s) binding the participant for the same services;
 - (b) a participant may specify a duration of Contract shorter than the duration of this Contract;
 - (c) a participant may specify that only some items under this Contract and/or less than its total requirement for an item are to be supplied under its contract; and
 - (d) any additional delivery charge identified and accepted in accordance with clause D3.4 and D3.5 will apply.
- D3.7 Each participant will be responsible for the administration of its contract and the fulfillment of its obligations under its contract. The City shall not incur any liability arising from any such contract.
- D3.8 No participant shall have the right or authority to effect a change in the contract, or of any other Participant in this Contract.

D4. DEFINITIONS

- D4.1 When used in this Bid Opportunity:
- (a) "**API**" means Application Program Interface;
 - (b) "**AV**" means Audio/Visual;
 - (c) "**CATV**" means Community Antenna TV;
 - (d) "**DP**" means Display Port;
 - (e) "**DVI**" means Digital Visual Interface;
 - (f) "**GUI**" means Graphical User Interface;
 - (g) "**HDMI**" means High-Definition Multimedia Interface;
 - (h) "**H.264**" means a block-oriented motion-compensation-based video compression standard that is currently one of the most commonly used formats for the recording, compression, and distribution of video content;
 - (i) "**IP**" means Internet Protocol;
 - (j) "**KVM**" means Keyboard, Video and Mouse;
 - (k) "**Mbps**" means Megabits per second;
 - (l) "**PTZ**" means Pan Tilt Zoom;
 - (m) "**PVR**" means Personal Video Recorder;
 - (n) "**TMC**" means Transportation Management Centre;
 - (o) "**User**" means a person, department or other administrative unit of the City authorized by the Contract Administrator to order Work under this Contract;
 - (p) "**VOIP**" means Voice Over Internet Protocol;
 - (q) "**VMS**" means Video Management Software;
 - (r) "**4K**" means (3840x2160 px) is a full HDTV signal format with 2160 horizontal lines and an

D5. CONTRACT ADMINISTRATOR

- D5.1 The Contract Administrator is:
Jonathan Foord, E.I.T.
Signals Asset Engineer
Telephone No. (204) 986-6619
Email Address: jfoord@winnipeg.ca

D5.2 At the pre-commencement meeting, the Contract Administrator will identify additional personnel representing the Contract Administrator and their respective roles and responsibilities for the Work.

D6. CONTRACTOR'S SUPERVISOR

D6.1 Further to C6.19, the Contractor shall employ and keep on the Work, at all times during the performance of the Work, a competent supervisor and assistants, if necessary, acceptable to the Contract Administrator. The supervisor shall represent the Contractor on the Site. The supervisor shall not be replaced without the prior consent of the Contract Administrator unless the supervisor proves to be unsatisfactory to the Contractor and ceases to be in his/her employ.

D6.2 Before commencement of Work, the Contractor shall identify his/her designated supervisor and any additional personnel representing the Contractor and their respective roles and responsibilities for the Work.

D6.2.1 Further to C5.5 Contract Administrator may give instructions or orders to the Contractor's supervisor and such instructions or orders shall be deemed to have been given to the Contractor.

D7. OWNERSHIP OF INFORMATION, CONFIDENTIALITY AND NON DISCLOSURE

D7.1 The Contract, all deliverables produced or developed, and information provided to or acquired by the Contractor are the property of the City and shall not be appropriated for the Contractors own use, or for the use of any third party.

D7.2 The Contractor shall not make any public announcements or press releases regarding the Contract, without the prior written authorization of the Contract Administrator.

D7.3 The following shall be confidential and shall not be disclosed by the Contractor to the media or any member of the public without the prior written authorization of the Contract Administrator;

- (a) information provided to the Contractor by the City or acquired by the Contractor during the course of the Work;
- (b) the Contract, all deliverables produced or developed; and
- (c) any statement of fact or opinion regarding any aspect of the Contract.

D7.4 A Contractor who violates any provision of D7 may be determined to be in breach of Contract.

D8. NOTICES

D8.1 Notwithstanding C22.3, all notices of appeal to the Chief Administrative Officer shall be sent to the attention of the Chief Financial Officer at the following facsimile number:

The City of Winnipeg
Chief Financial Officer

Facsimile No.: 204 949-1174

D8.2 **Bid Submissions must not be submitted to this facsimile number. Bids must be submitted in accordance with B7.**

SUBMISSIONS

D9. AUTHORITY TO CARRY ON BUSINESS

D9.1 The Contractor shall be in good standing under The Corporations Act (Manitoba), or properly registered under The Business Names Registration Act (Manitoba), or otherwise properly registered, licensed or permitted by law to carry on business in Manitoba, or if the Contractor does not carry on business in Manitoba, in the jurisdiction where the Contractor does carry on

business, throughout the term of the Contract, and shall provide the Contract Administrator with evidence thereof upon request.

CONTROL OF WORK

D10. COMMENCEMENT

- D10.1 The Contractor shall not commence any Work until he/she is in receipt of a notice of award from the City authorizing the commencement of the Work.
- D10.2 The Contractor shall not commence any Work on the Site until:
- (a) the Contract Administrator has confirmed receipt and approval of:
 - (i) evidence of authority to carry on business specified in D9;
 - (ii) evidence of the workers compensation coverage specified in C6.14; and
 - (b) the Contractor has attended a meeting with the Contract Administrator, or the Contract Administrator has waived the requirement for a meeting.
 - (c) a purchase order has been received from The City of Winnipeg denoting the quantity of licenses required.

D11. DELIVERY

- D11.1 Goods shall be delivered on an "as required" basis during the term of the Contract, f.o.b. destination, freight prepaid, to various locations within the City.
- D11.1.1 Goods shall be delivered within three(3) Calendar Day(s) of the placing of an order, unless otherwise allowed by the User at the time of ordering.
- D11.2 It is expected that licenses shall be digitally delivered through email, with availability for City management of licensing through the developers web portal.

D12. LIQUIDATED DAMAGES

- D12.1 If the Contractor fails to achieve the Work of the Contract in accordance with D2, the Contractor shall pay the City one hundred and fifty dollars (\$150) per Working Day for each and every Working Day following the day fixed herein until the Work is complete.
- D12.2 The amount specified for liquidated damages in D12.1 is based on a genuine pre-estimate of the City's damages in the event that the Contractor does not achieve the Work of the Contract.
- D12.3 The City may reduce any payment to the Contractor by the amount of any liquidated damages assessed.

D13. ORDERS

- D13.1 The Contractor shall provide a local Winnipeg telephone number or a toll-free telephone number at which orders for service may be placed.

D14. RECORDS

- D14.1 The Contractor shall keep detailed records of the services supplied under the Contract.
- D14.2 The Contractor shall record, as a minimum, for each item listed on Form B: Prices:
- (a) user name(s) and addresses;
 - (b) order date(s);
 - (c) service date(s); and
 - (d) description and quantity of services provided.

D14.3 The Contractor shall provide the Contract Administrator with a copy of the records for each quarter year within fifteen (15) Calendar Days of a request of the Contract Administrator.

MEASUREMENT AND PAYMENT

D15. INVOICES

D15.1 Further to C11, the Contractor shall submit an invoice for each portion of work performed delivered to:

The City of Winnipeg
Corporate Finance - Accounts Payable
4th Floor, Administration Building, 510 Main Street
Winnipeg MB R3B 1B9

Facsimile No.: 204 949-0864
Email: CityWpgAP@winnipeg.ca

D15.2 Invoices must clearly indicate, as a minimum:

- (a) the City's purchase order number;
- (b) date of delivery;
- (c) delivery address;
- (d) type and quantity of work performed;
- (e) the amount payable with GST and MRST shown as separate amounts; and
- (f) the Contractor's GST registration number.

D15.3 The City will bear no responsibility for delays in approval of invoices which are improperly submitted.

D15.4 **Bid Submissions must not be submitted to the above facsimile number. Bids must be submitted in accordance with B7.**

D16. PAYMENT

D16.1 Further to C11, payment shall be in Canadian funds net thirty (30) Calendar Days after receipt and approval of the Contractor's invoice.

D16.2 Further to C11, the City may at its option pay the Contractor by direct deposit to the Contractor's banking institution.

WARRANTY

D17. WARRANTY

D17.1 Further to C12, if a defect or deficiency prevents the full and normal use or operation of the Work or any portion thereof, for purposes of calculating the warranty period, time shall be deemed to cease to elapse for the defective or deficient portion, and for any portion of the Work whose use or operation is prevented by such defect or deficiency, as of the date on which the defect or deficiency is observed or the use or operation is prevented and shall begin to run again when the defect or deficiency has been corrected or the Work may be used or operated to the satisfaction of the Contract Administrator.

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS

- E1.1 These Specifications shall apply to the Work.
- E1.2 Bidders are reminded that requests for approval of substitutes as an approved equal or an approved alternative shall be made in accordance with B6.

E2. SERVICES

- E2.1 The Contractor shall supply Transportation Management Centre AV system software licenses in accordance with the requirements hereinafter specified.
- E2.2 Item No. 1 - AV Server License shall be sufficient to provide the TMC AV system with full AV server functionality including the availability to define up to 16 concurrent User AV Control and the definition of unlimited software encoded screen-scraped AV KVM sources. 1 User AV Control License shall be included with the AV Server License, with additional concurrent users requiring additional licensing.
- (a) The AV Server License shall:
- (i) Fully support functionality as described in E3 General AV System Requirements
 - (ii) Provide full functionality of installed TMC AV equipment as described in E4 General Description of Installed TMC AV Equipment
- (b) Approved Product is Barco TFN CMS2 SRV LIC 1-16 CON R9832708 and INFO: CMS 1 x FREE SIDEBAR INCLUDED RINF-FREE-SIDEBAR
- E2.3 Item No. 2 - User AV Control License shall be the licensing required permitting one additional concurrent user the ability to control the TMC AV system. They AV system shall not restrict the number of control users to be defined, installed, and available to use. The maximum number of concurrent users (active) shall be equivalent to the total number of User AV Control Licenses procured plus the included one AV Server Control License included in Item No. 1. The system shall also be constrained to the AV Server License constraint of a maximum of 16 concurrent users, unless otherwise increased. User AV Control License refers to the AV Client license and use.
- (a) The User AV Control License shall:
- (i) Fully support functionality as described in E3 General AV System Requirements
 - (ii) Provide full functionality of installed TMC AV equipment as described in E4 General Description of Installed TMC AV Equipment
- (b) Approved Product is Barco TFN CMS2 SIDEBAR LICENSE R9832699
- E2.4 Item No. 3 - AV Display License shall be the licensing required to permit the use of one display output for the broadcasting/view of an unlimited number TMC AV sources which are only limited by the number of sources available, hardware decoding capabilities, and concurrent source viewing licenses procured. One display shall be sufficient to utilize an aggregation of multiple displays that make up a single video wall, or one display utilized as an individual flat panel display, or digital projector. The license provides the availability to send TMC AV sources to AV system connected unmanned displays, and does not limit the number of local displays where local User Control Licenses are being utilized to control and locally render AV sources.
- (a) The AV Display License shall:
- (i) Fully support functionality as described in E3 General AV System Requirements
 - (ii) Provide full functionality of installed TMC AV equipment as described in E4 General Description of Installed TMC AV Equipment
- (b) Approved Product is Barco TFN CMS2 DISPLAY LICENSE R9832698

- E2.5 Item No. 4 - AV View License shall be the licensing required permitting the concurrent display or broadcasting of one instance of a TMC AV source to any TMC AV Display or to a locally rendered display of a TMC AV control user.
- (a) The AV View License shall:
 - (i) Fully support functionality as described in E3 General AV System Requirements
 - (ii) Provide full functionality of installed TMC AV equipment as described in E4 General Description of Installed TMC AV Equipment
 - (b) Approved Product is Barco TFN CMS2 VIEWER LICENSE R9832702
- E2.6 Item No. 5 - Legacy API License shall be the license required to provide legacy API functionality for the TMC AV system.
- (a) The API license shall:
 - (i) Shall fully support functionality as described in E3 General AV System Requirements
 - (ii) Shall provide full functionality of installed TMC AV equipment as described in E4 General Description of Installed TMC AV Equipment
 - (b) Approved Product is Barco TFN CMS2 LEGACY API LICENSE R9832703
- E2.7 Item No.6 - Software Care shall be the license required to provide one calendar year of software care for the period commencing upon procurement and delivery (of the license).
- (a) The Software Care shall have the AV Developer provide:
 - (i) Business hour helpdesk support and AV system use assistance through an online e-portal, mail, telephone, and internet support;
 - (ii) Assistance and how-to for AV compatibility questions;
 - (iii) AV system problem identification including analysis or reproduction of reported problems, and remote troubleshooting assistance;
 - (iv) Access to latest patches and service releases as available;
 - (v) Remote installation advisory support; and,
 - (vi) Upgrades to latest version/release of the AV system software

E3. GENERAL AV SYSTEM REQUIREMENTS

- E3.1 The AV system shall be a complete IP-based end-to-end system implementing control room workflows, AV collaboration, and the development of situational awareness views in the fastest, most efficient and effective way.
- E3.2 It shall support following functions:
- (a) Provide situational awareness: by ensuring the capture, transport and visualization of various types of information sources (video, data and/or audio)
 - (b) Multi-person and multi-location use and collaboration: enabling the sharing of situational information between multiple users or outputs, across multiple locations spanning the network.
 - (c) Interaction with control room applications: allow TMC operators to (remotely) control applications from their desk
 - (d) 3rd Party Integration: allowing control of control and meeting room equipment through touch and web interfaces.
 - (e) 14 hour business day year round commercial/industrial usage up to 24/7 for special events.
 - (f) Scalable to add additional users, groups, inputs, and outputs as required.
- E3.3 The complete AV system shall consist of the following components:
- (a) Input AV sources

- (b) Display outputs
- (c) IP-based distribution network
- (d) Collaboration software
- (e) Interface with external systems
- (f) Additional network services
- (g) System level performance and capabilities
- (h) Network security and information assurance

E3.4 Source Capture

- E3.4.1 The AV System shall be capable of simultaneously displaying multiple types of video signals, IP based streaming video formats, remote desktops, video graphics, web pages, graphic files, video files, encoded audio visual streams, and application for simultaneous viewing on any system display.
- E3.4.2 The AV System shall allow the definition of an unlimited amount of sources
- E3.4.3 Sources shall be defined within the system and available to any authorized user.
- E3.4.4 The AV system shall utilize software and hardware capture of audio, video, and data sources and shall convert them to IP streams that can be efficiently transported on standard IP based networks.
- E3.4.5 The supplied AV system shall provide the capability to integrate the following source captures for use and control within the global AV system:
- (a) High resolution video and audio signals capture: encoding of video and audio baseband signals using industry standard codecs. Unless otherwise agreed to by the Contract Administrator, all encoded video shall be h.264.
 - (i) High resolution video and graphics encoders shall provide the:
 - ◆ Capture of audio, video, and graphics for use on IP networks.
 - ◆ Up to 4K encoding and loop through options. Loop through encoders shall provide industry standard monitor connections such as DVI/HDMI/DP
 - ◆ Optimized image quality and streaming by allocated/available bandwidth to each endpoint.
 - ◆ Availability to define the maximum output bitrate limit and ensure the optimized streams do not exceed stated limits while maintaining the image and stream quality.
 - ◆ Provide full frame rates up to 60 fps, and
 - ◆ Typical end to end latencies of 100 milliseconds or less
 - ◆ Unicast and multicast streaming
 - ◆ Provide accurate colour, and visually lossless video and graphic content to multiple output endpoints.
 - ◆ End to end frame-synchronized replication of content shown across multiple display outputs.
 - ◆ Encoders shall be capable for use as decoders.
 - ◆ External/discrete video and graphic encoder options shall enable the connection of PC keyboard and mouse input for remote operation. The keyboard and mouse signals shall be transported on the IP network. Latency between the remote keyboard and mouse via the encoder connection to the controlling PC shall be less than 100 milliseconds. Remote mouse movement shall be smooth and accurate providing remote users with no/minimal noticeable delay. (Less than 100 milliseconds)

- (ii) Encoder AV System Integration
 - ◆ The encoder shall automatically register itself to the AV central management system
 - ◆ A web interface shall provide an overview of all encoding decoding devices on the network.
 - ◆ Setup wizards shall allow mass configuration of multiple system encoders.
 - ◆ Encoders shall provide automatic EDID management and scaling when utilized as a decoder.
- (iii) Encoder Connectivity and Flexibility
 - ◆ Shall provide connectivity using standard computer cables and connections.
 - ◆ Shall provide input encoding of standard computer display output resolutions.
 - ◆ Encoders shall permit the choice of two types of digital video inputs for computer video signal output connection.
 - ◆ Shall provide the availability to define encoded output resolution, compression, and frame rate up to 60 fps.
 - ◆ Availability to define the maximum output bitrate limit and ensure the optimized streams do not exceed stated limits while maintaining the image and stream quality.
 - ◆ Unless otherwise agreed to by the Contract Administrator, all encoded sources shall provide 12 Mbps streams or less for encoded outputs of 1920x1200 pixels 60 fps or less.
 - ◆ Source Encoding shall use non-proprietary industry standard formats and resolutions enabling decoding by general user computer hardware on the city network while minimizing the need for additional decoding hardware.
- (b) Encoded IP network stream capture: shall directly accept and integrate already encoded network IP video into the AV system, and shall process these streams where necessary to ensure compatibility with the entire AV system and ensure low latency processing.
 - (i) Shall provide watchdog functionality ensuring high availability of streaming video as required.
 - (ii) Shall report on loading for high level resource management
- (c) Remote Desktop software capture: shall enable the capture of the graphical output generated by OS's and applications to serve as sources for the use within the global AV system. The AV system remote desktop software capture shall:
 - (i) Allow access and control of the remote desktop server from an AV connected client via keyboard and mouse.
 - (ii) Support Windows 7, 8, and 10.
 - (iii) The following modes of remote desktop software capture shall be provided:
 - ◆ Full remote desktop: capturing the complete remote desktop including multi-screens.
 - ◆ Single remote desktop display: capturing one of potentially multiple displays from a remote desktop
 - ◆ Desktop cropping of a rectangular section of the display by X and Y coordinates
 - ◆ Application Window: capturing a particular application window by application name.
 - ◆ Content of the application window shall be displayed

- ◆ Application name shall be indicated at output
- (iv) The use of virtual desktops for screen-scraping of sources shall be permitted.

E3.5 Remote Desktop Control and Software Keyboard Video Mouse (KVM)

- E3.5.1 The AV system shall enable an operator to use software KVM to instantly connect and control remote desktop(s) from keyboard and mouse connected encoders or through remote desktop software capture.
- (a) The AV system client's local keyboard and mouse shall operate as the input and control devices of the remote desktop as if the keyboard and mouse were connected directly to the remote desktop.
 - (b) The local keyboard and mouse shall operate in a periodic update mode in addition to a real-time update mode for smooth cursor update.
 - (i) The keyboard and mouse signals shall be transported on the IP network.
 - (ii) Latency between the remote keyboard and mouse via the encoder connection to the controlling PC shall be less than 100 milliseconds.
 - (iii) Remote mouse movement shall be smooth and accurate providing remote users with no/minimal noticeable delay.
 - (c) The AV system shall enable a client to move to the top/bottom/left/right edges of a local desktop to up to four pre-defined remote desktops as defined by client user.
 - (d) The AV system shall permit system administrators to manage IP addresses or range of IP addresses that can access target remote desktops.
 - (e) The AV system shall restrict the view and/or interaction to only specific display(s) of the target remote desktop. It shall permit system administrators to restrict a client user from accessing a remote system with multiple displays, to interact only with the application shown on any particular display.
- E3.5.2 The application shall have the capability to provide notification to the host machine user (operator) when the desktop transport is active and connected to the core system.
- E3.5.3 The application shall allow the host machine operator (if authorized) to set control parameters for communication with the core system; disabling keyboard and mouse or desktop transport when desired.
- E3.5.4 Ease of Install
- (a) The remote desktop software client shall be easily installed on a user's workstation through the AV system, and be automatically detected by the AV system.
- ### E3.6 Display Output
- E3.6.1 The AV system shall be able to drive multiple displays of various resolutions in multiple locations connected by standard IP networks.
- E3.6.2 The AV system shall be capable of displaying any available system source on any common commercially available display(s) utilizing common standard video signal types
- E3.6.3 Displays, scalable in quantity and locations shall be defined within the system and available to any authorized user
- E3.6.4 The AV system shall be able to arrange and layout multiple AV system sources for decoding and presentation as composite streams on a display output or across a multiple display video wall.
- E3.6.5 Layouts of arranged multiple sources shall be viewable and shareable across displays or clients across the network.
- (a) The AV System Display Output devices shall operate as group where required to create one seamless synchronous and unlimited size display wall.

- (b) Display output devices shall be frame-locked and vertical-synch–locked for synchronized output as required.
- (c) Client Workstations
 - (i) Shall be able to create, share, collaborate, or view decoded AV system layouts with multiple AV system sources.
 - (ii) Shall use software and hardware acceleration where available to decode AV sources, and minimize cpu/gpu utilization where applicable.

E3.7 IP Distribution Network

- E3.7.1 The AV system shall be capable of transporting any captured signal to any location using a standard IP network.
- E3.7.2 The AV system shall support multicast of captured signals to minimize network bandwidth requirements.
- E3.7.3 The AV system shall support:
 - (a) network operation with layer 2 or layer 3 switches or routers and have IGMP query and snooping capabilities to avoid network flooding due to multicasting.
 - (b) high bandwidth 1 Gb/s network connections without oversubscription
 - (c) standard network cabling such as but not limited to Cat6a, Cat 6, and Cat5e

E3.8 AV System User Collaboration

- E3.8.1 The AV system shall support full redundancy from a network level up to fully redundant servers and displays. The AV system shall support the monitoring of the state of the network, servers, and displays and initiate fail-over switching on any of the devices or the network itself.
- E3.8.2 The AV system shall utilize current and future off-the-shelf PC components through the transparent use of industry standard hardware acceleration of modern graphic cards. The AV system software shall support the easy and open integration possibilities with 3rd party systems.

E3.9 Architecture and API

- E3.9.1 The AV system software shall support client server architecture.
- E3.9.2 The server(s) running the AV system software shall support fully redundant operation
- E3.9.3 The AV system software shall be able to share or push complete and/or partial desktop content between workstations and between unmanned displays or workstations.
- E3.9.4 The AV system software shall provide capabilities to provide highly customizable system actions in response to third-party application real-time events.
- E3.9.5 The AV system software shall provide an application programmer's interface (API) to facilitate third-party software to control and access the AV system software features including the ability to:
 - (a) Query the available composed views
 - (b) Launch sources in windows
 - (c) Switch views
 - (d) Switch current window contents to available inputs for both networked or non-networked sources (on the input cards)
 - (e) Query the overall system status, and
 - (f) Launch applications

- E3.9.6 The AV System software shall provide an API that provides the capability for third-party control systems and applications to send commands to the system via standard TCP/IP or RS-232 protocols.
- E3.9.7 The AV system software shall support Simple Object Access Protocols (SOAP) , REST, and Telnet API for touch panel controls and 3rd party AV integration.
- E3.10 Source Management
- E3.10.1 The AV system software shall manage the multiple input sources connected to the global AV system network.
- E3.10.2 The AV system software shall be able to auto-detect sources available on the network
- E3.10.3 The AV system software shall be able to display a complete and organized list of available sources.
- (a) The AV system shall support the following types of sources:
- (i) Networked Desktops
- ◆ Software screen-scraping of user workstations connected to the AV network.
 - ◆ Software screen-scraping up to 120Mb
 - ◆ Full desktop, partial desktop, multi-head, or active application window
 - ◆ Operator workstations connected to DVI/HDMI/DP IP encoders up to 1920x1200 resolution per source
 - ◆ Operator workstations connected to DVI/HDMI/DP IP encoders up to 4k resolution per source
 - ◆ Allows screen-scraping of source PCs where software cannot be installed, where source PC is on separate secured network, or where dynamic video may be shared and needs to be disseminated on the global AV network with high quality streaming, and low end to end latency for view and control.
- (ii) Streaming Video
- ◆ Streaming video sources from interoperable encoders
 - ◆ Streaming sources from encoded IP network stream capture
- E3.11 Displayed Sources
- E3.11.1 The AV system shall provide users the availability to display additional meta data, input user definable content and labels, and change appearance of individual AV system sources such as:
- (a) Source name as label
- (b) Status of Source
- (c) Audio Presence Indicators
- (d) Date-time Indicators
- (e) Text
- (f) Border Colours
- (g) Logos insertion (image files)
- (h) User definable message ticker that can be configured for position (top, bottom, left, and right), language, scroll speed, and direction of scroll
- E3.12 Application Management
- E3.12.1 The AV system software shall permit the operator to manage applications installed on unmanned application computers.

- E3.12.2 The AV system shall include complete software keyboard video management (KVM) using the remote desktop capture software to permit users to take mouse and keyboard control of the following:
- (a) Manned Displays (operators workstation)
 - (b) Unmanned displays
 - (c) Any screen scraped application
 - (d) Any IP Encoded Source
- E3.12.3 The AV system through 3rd party integration shall support the capability to control CATV PVR receivers, PTZ video conferencing controls, VOIP controls, and room audio visual.
- (a) The AV system shall support the use of touchscreens and web interfaces to enable user control of these devices and specified functionality.
- E3.13 Display Output Management
- E3.13.1 The AV System GUI shall provide an intuitive means for dynamically arranging content on any of the system displays. It shall provide a graphical representation with option for local rendering of all system displays and indicate all content available and currently displayed in the system.
- E3.13.2 The AV system GUI shall display all defined system resources authorized for access by the current user profile. System resources shall be viewable as a list, resource tree, or searchable by typing the designation of the desired resource.
- E3.13.3 The AV system GUI shall allow multiple users to log in and control the system concurrently; each in accordance with their own user rights.
- E3.13.4 The AV system software shall permit sources to be rendered on manned or unmanned displays with a given users intervention.
- E3.13.5 The AV system software shall provide the capability to create layouts consisting of arranged multiple AV system global sources to create situational awareness views.
- E3.13.6 The AV system software shall provide a GUI client interface to allow users to create, preview, drag and drop sources into multisource layouts.
- (a) The AV system software shall allow the creation of virtual layouts with arranged AV sources and shall enable
 - (i) rendering of sources on a local users computer
 - (ii) sharing of virtual layouts with other network AV system users (also rendered for networked users)
 - (iii) collaboration with other networked AV system users through software KVM capabilities.
- E3.13.7 The AV system client GUI shall allow users to push layouts with arranged multiple AV sources to manned or unmanned displays, passed on permissions.
- E3.13.8 The client GUI shall be non-intrusive and require minimal amount of user desktop space.
- E3.13.9 The client GUI shall allow the user to organize single or multiple layouts of arranged AV sources into larger composite layouts for dissemination to the global AV system.
- E3.13.10 The AV client software shall permit a user to create, name, store, and launch layouts of arranged sources and locally share to other AV clients on the AV network.
- E3.13.11 The AV client shall permit the user to turn on or off local rendering of a multi AV source layout
- E3.13.12 The AV client GUI shall provide user feedback of CPU loading.
- E3.13.13 The AV system shall provide the capabilities for user friendly and fast layout switching, to load layouts on a particular display, or on multiple displays simultaneously.

- E3.13.14 The AV system shall support turning displays on or off, or input selection, and hotkey executable macros.
- (a) The AV system GUI shall provide the capability to create, store and recall multiple scripted actions. These scripts shall be assignable to user-defined push button-like graphical controls, allowing the scripts to execute upon clicking.
- E3.13.15 The AV system shall support the option for scheduling and dwell time of sources, multisource layout arrangements, and overall layouts including defined start and end times.

E3.14 AV Content Management and Arrangement

- E3.14.1 The AV system GUI shall provide the following content management functions:
- (a) Resource view: A list of all available resources available to the system.
 - (b) Resource search: The capability to search system resources by typing the name of the resource.
 - (c) Video wall representation: the capability to see and manipulate a graphical representation of the video wall and/or displays along with the current content being displayed in real-time.
 - (d) Content templates: The capability to store and recall image locations on the video wall display independently of actual content. New content added to the video wall is immediately aligned to content template boundaries.
 - (e) Presets: The capability to store and recall content along with their relative positions on the video wall.
 - (f) Crop: The capability to remove unwanted peripheral content from displayed content
 - (g) Zoom: The capability to magnify areas of a displayed source on the video wall.
 - (h) Size: The capability to re-size content as it appears on the video wall; either preserving or modifying the original aspect ratio of the source.
 - (i) Layering: The capability to place content on top of (or underneath) other content on the video wall.
 - (j) Snap: The capability to force displayed content to align with the boundaries of a display.
 - (k) Source default parameters: The capability to define default size and aspect ratio settings for a source.
 - (l) Event scheduling: The capability to automatically call up predetermined content on the video wall by time-driven schedule.
 - (m) Multi-views: The capability to create multiple alternate versions of displayed video wall content and toggle rapidly between them.
- E3.14.2 The following capabilities shall be provided if available:
- (a) Zoom: The capability to magnify areas of a displayed source on the video wall.
 - (b) Image Blending: The capability to make a displayed image partially transparent thereby making layered content underneath the primary image visible.
 - (c) Color Keying: The capability to make certain colors of a displayed image transparent thereby making layered content underneath the color visible.

E3.15 Audio Management

- E3.15.1 The AV system software shall support integrated audio systems to allow full user control of all audio sources defined in the system.
- E3.15.2 The AV system GUI shall support multi-zone audio control providing the capability to select audio source and control volume for all audio-capable sources and all audio zones defined within a system.

E3.16 System Maintenance and Monitoring

- E3.16.1 The AV system shall support software updates that push through the AV central server to avoid updating an AV client per client.
- E3.16.2 The AV system shall provide an administration control panel for Administrators logged into the AV client.
- E3.16.3 The AV system software shall permit the logging of the following:
 - (a) Client Logging
 - (b) Central Server Logging
- E3.16.4 Where logs shall not be automatically overwritten
- E3.16.5 The AV system software shall produce logs that shall contain the minimum information:
 - (a) Individual User ID that has control of the video wall at any given time
 - (b) Name of PC that has control of video wall at any given time
 - (c) Time control was taken
 - (d) Time control was released
 - (e) Source(s) rendered – start and end time
- E3.16.6 Time stamps in log shall be in intervals of one (1) second or less.
- E3.16.7 The AV System shall support the option for a monitoring application that provides the system with the capability to independently monitor and report on the health of all major system components.

E3.17 User Management

- E3.17.1 The AV system software shall support user management capabilities as follows:
 - (a) Authentication and Permission System
 - (i) User accounts are validated against Active Directory
 - (ii) Permissions for functionality
 - (iii) Roles
 - (b) Active Directory, LDAP
 - (i) No storage of passwords in the AV system
 - (c) Internal Accounts
 - (i) Storage of passwords on the AV system server only
 - (ii) Password database is encrypted
 - (d) Role Based
 - (i) Roles define access to resources
 - (e) Security for APIs
 - (i) Special API accounts shall be available to define permission and roles.

E3.18 System Level Performance and Capabilities

- E3.18.1 The AV system shall be fully scalable, and shall be extendable at any time in terms of:
 - (a) Number of sources
 - (b) Number of displays
 - (c) Number of screens per display
 - (d) Number of concurrent clients
- E3.18.2 Increases of the above shall be realized with incremental cost and shall not require a major system overhaul.

E3.19 Security and Information Assurance

E3.19.1 The manufacturer shall disclose its information assurance general policy with respect to product release cycles

E3.19.2 Information Assurance Certification Required (CON)

E3.20 Fault Tolerance and Robustness

E3.20.1 The AV system hardware and software shall provide capabilities for redundant techniques:

E3.20.2 AV system source capture units and display outputs shall support redundant network connections to the IP Network

E3.20.3 The AV system software shall support running on redundant server hardware with automatic switching from one server to another in case of first server failure.

E3.20.4 The AV system shall support virtualized server support

E3.20.5 Network display outputs shall support N+ 1 redundant configuration where in the case of a failure of a single output unit, the redundant output unit is activated and takes over the task of the failed unit.

E3.20.6 The switch from the failed unit to the redundant unit will happen without requiring any physical re-cabling between display output units and screens.

E4. GENERAL DESCRIPTION OF INSTALLED TMC AV EQUIPMENT

E4.1 Below is a list of equipment currently installed within the TMC:

Model/Part	Description	Unit	Quantity	Manufacturer
TMC Displays - TMC Room				
R9849000	LCD-55 configured options (KVD/OVD)	Each	8	Barco
CGP-GBCM-CTRL	Green BCM Box	Each	1	Barco
CGP-GBCM-PSSWITCH	Green Power Switch	Each	8	Barco
R9849311	LCD display IVD5521	Each	8	Barco
TMC AV Input Hardware Encoders - TMC Room (Operators)				
R9848900	TFN 1CH DVI INPUT NODE	Each	1	Barco
TMC AV Input Hardware Encoders - TMC Supervisor				
K9303071A	NGS-D220 Lite	Each	1	Barco
TMC AV Input and Output Hardware Encoders and Decoders (TMC VMS Sources/Video Wall Output)				
K9303071A	NGS-D220 Lite	Each	1	Barco
K9303071A	NGS-D220 Lite	Each	2	Barco
R9821000B	TFN NDN-210 Display Node Pro US	Each	2	Barco

E5. SOFTWARE END OF LIFE

E5.1 The AV developer should provide at minimum three years of software manuals and documentation, and web downloadable software based on the in use AV version release date. Critical hotfixes and extension purchases should be available for a minimum 3 years after the in use AV version initial release date.