

WebCGM 3.0 Proposed Requirements – March 1, 2015

Author: Don Larson

2. Need for WebCGM 3.0 project

While WebCGM 2.01 and 2.1 addressed viewer interoperability issues and use of CGM in internet application, issues related specifically to authoring and editing of WebCGM were deferred. This version of WebCGM will address issues such as Integrated Drawing Elements to increase interoperability between authoring tools, further eliminate need for proprietary graphics formats.

The RGBa color model was permitted in WebCGM 2.0 but no test data was developed to test viewers at that time. Now there is growing requirement for RGBa in graphics application and RGBa is widely supported in graphic processors and software libraries so test files are needed. Another area found to be problematic in usage amongst viewers in CGM community is Tiled Raster element due to large number of variation possible Tiled Raster parameters so likewise more test for Tiled Raster would be helpful to developers.

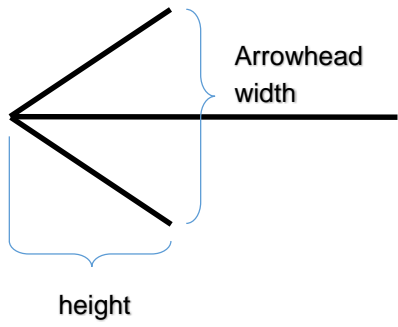
3. Requirements

3.1 Integrated Drawing Elements

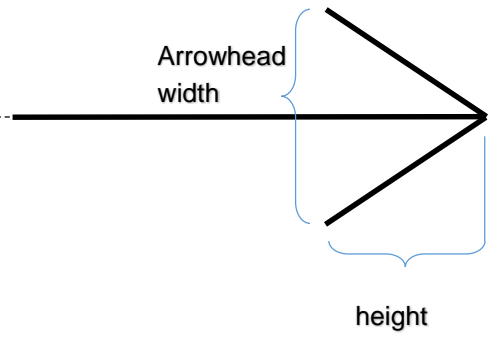
New drawing structures and attributes for drawing elements Arrows, Callouts and Line halos used extensively in technical illustration. While these drawing elements can be encoded in CGM by an authoring tool with polylines and/or polygons they become problematic when a CGM is re-opened for editing. A single arrow for example becomes multiple graphical elements making editing of those arrows tedious.

3.1.1 Arrows- The proposal is to add line attributes that specify the arrowhead type, height and width for both starting and/or ending arrowheads.

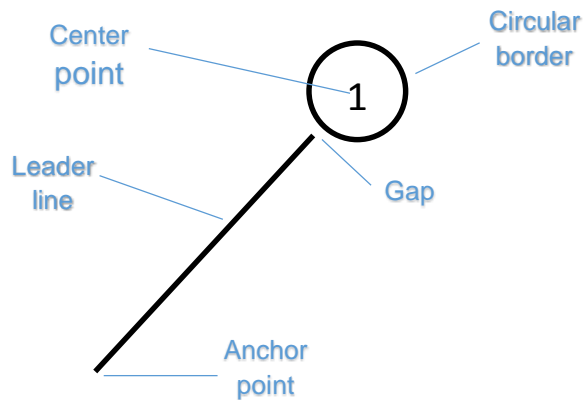
Starting arrowhead at the beginning of a line or curve, e.g. Polyline, Polybezier...



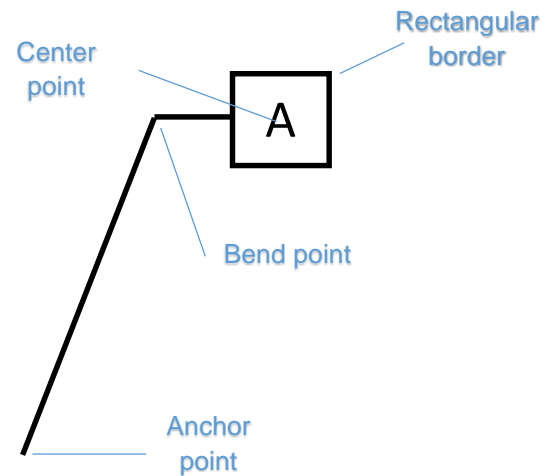
Ending arrowhead at the end of a line or curve.



3.1.2 Callouts-The proposal is to add a Callout structure with attributes: text, border: rectangular, circular or none, leader line: straight or bent, gap length, anchor, bend (if bent leader) and center points.



(typical callout and associated attributes)



(callout with bent leader line and rectangular border)

3.1.3 Halo lines-Proposal is to add a Halo line type specified as multiple of line width. The halo color could be inherited from aux color.

3.1.4 Benefit: The *integrated drawing elements* enhancements will close a gap in graphical interoperability by retaining high level functionality throughout the illustration's life cycle rather than visual similarity only.

3.2 Line Bundles – Currently the profile does not permit LINE REPRESENTATION and associated elements. Many CGM authoring tools use a pen style concept which allow the line attributes, line width, type and color to be assigned from a table of standard or preset values. This is useful for maintaining uniformity between technical illustrations.

Presently authoring tools are required to output the individual line attributes rather than using the LINE REPRESENTATION for bundled attributes. This means that when a CGM is re-opened in another editor the “pen style” information is lost. Permitting LINE REPRESENTATION will enable the pen style information to be maintained in the CGM.

3.2.1 Benefit: Enhances interoperability between authoring software and helps maintain line attributes uniformity in illustrations.

3.3 Additional test data to verify interoperability

3.3.1 RGBA Color model examples- WebCGM 2.0 profile permits RGBA but there are no test cases available for developers to test viewers and editors.

3.3.1 Tiled Raster Array variations- numerous interoperability problems have been encountered with numerous possible variations. More of these possible variants need test cases.

3.3.1.1 Different bits per pixel: 1, 8, 24

3.3.1.2 Different raster compression modes, e.g. Group 4, JPEG, PNG

3.3.1.3 Different Rotations

3.3.1.4 Transparent Cell Color combined with all of the above variations.