Best Paper Format and Viewing Distance to Represent the Scope and Scale of Visual Impacts

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Why Viewing Distance Matters

"Because perceptions of depth and scale are proportional to the viewing distance, if an image is held too close to (or too far away from) the eye then the effect will be to make the focal point(s) in the image appear larger (or smaller) than observed in the landscape."

Hunter & Livingstone, 2012, p.23.

The following photos illustrate the implications of these guidelines.















Calculating Appropriate Viewing Distance

Principles of Perspective and the Picture Plane



Calculated Viewing Distance

• "Normal" photograph

 $\frac{\frac{1}{2}simulation\,width}{\tan(\frac{1}{2}horizontal\,angle\,of\,view)}$

Cylindrically projected panoramic photograph

panorama width * 360

 $2\pi * angle of view$

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Prepared by LandWorks, Middlebury, VT

graph

View Location Map

Simulation Information **Turbine Information** Model: Vestas V112 - 3.0 MW Hub height: 275'-7" (84 m) Rotor diameter: 367'-6" (112 m) Photograph Information Date and time: 5/5/10; 12:22 pm Location: Junior Lake (northwest portion, approx. 550' off western shore), Lakeville; 45.316' N, -68.031' W Camera elevation above sea level: 306' (93.3 m) an rength (35mm equivalent): 50 Simulation viewing distance: 19" (48.3 cm) stance to nearest visible turbine: 4.4 (7.1 km) Furthest: 5.6 miles (9.1 km) **Technical Information** Software: ArcGIS 3J Analyst; Nemetschek VectorWorks 2008; SketchUp Pro 8; Adobe Photoshop CS5 Contour data source: http://www.megis.maine.gov/catalog

NOTES:

1. This visual simulation is based on GIS data available at the time from MEGIS and First Wind. Data is only as accurate as the original source and is not guaranteed by LandWorks.

This simulation depicts turbines, as well as visibility of access roads, collector lines, and associated clearing.

firstwind

Guidance for Viewing Photosimulations

"We therefore recommend that what is comfortable and natural for the viewer should dictate the technical detail and not vice versa.."

University of Newcastle, 2002, p.60.

Viewing "Normal" Photos

"We were very specific ... Images should be held at a 'comfortable' viewing distance (but not necessarily at 'arm's length'). It was noticeable that the natural viewing distance for most respondents was instinctively about 500mm for the A3 images."

Hunter & Livingstone, 2012, p.23.

Viewing Panoramic Photos

"The fact that the panoramic images ... are often **not viewed in-situ means** the provision of viewing instructions is all the more important as **there is no means of verifying the realism of the visualization**."

Hunter & Livingstone, 2012, p.23-24.

This Begs Several Questions

- At what distance do participants find it "comfortable and natural" to hold the photographs?
- 2. Is the view best represented by a singleframe or panoramic photograph?
- 3. What is the **optimum size for displaying** simulations?

This Investigation is conducted as a Classroom Exercise

The "materials" include:

- Single-frame simulations on A3 and A4 paper
- Panoramic simulation on A3 and large poster
- Tape measures
- Workbook for each student

Pairs of students work together to make the measurements easier.

Interactive Learning

Panoramic and "Normal" Photos

T. J. Boyle Associates, Long Point Camps Offshore Visualization

Measuring "Arms Length"

Sleeve length: Measure from the top tip of your shoulder down to your wrist in inches. No more or less!

Photo Dimensions and Calculated Viewing Distances

	Angle of View (°)		Dimensions (cm)		
Simulation Formats	Horizontal	Vertical	Horizontal	Vertical	Viewing Distance (cm)
A: Panorama Poster-Size	124	55	147.3	72.1	67.8
B: Panorama Tabloid-Size	124	55	42.7	20.6	19.8
C: "Normal" Photo Tabloid-Size	37.3	25.1	40.1	26.7	59.4
D: "Normal" Photo Letter-Size	37.3	25.1	26.2	17.3	38.6

Measured and Calculated Viewing Distance

Legend:
Measured + Calculated

Representation of Project Scope

View each simulation in a way that is both comfortable for you and you believe communicates the project's <u>scope</u> (i.e., extent in the landscape) most accurately. Then use the 7-point scale to rate the effectiveness of the simulation format in communicating the project's <u>scope</u>, where "4" is just right.

Representation of Project Scope

Representation of Project Scale

View each simulation in a way that is both comfortable for you and you believe communicates the project's <u>scale</u> (i.e., size relative to other features) most accurately. Then use the 7-point scale to rate the effectiveness of the simulation format in communicating the project's <u>scale</u>, where "4" is just right.

TOO SMALL 1 2 3 4 5 6 7 TOO LARGE

Representation of Project Scale

Viewer Experience

- Poster panorama. Comfortably fill field of vision—feels most like 'I'm there.'
- Tabloid panorama. Way too small to even understand the project.
- Tabloid "normal". Comfortable scale of turbines...Allows context to be understood easily.
- Letter "normal". Photo size is nice in the hand...Very tiny, lacks detail, strains eyes.

There is still lots to learn about how people understand visual simulations! Will you help?

