

# A guide to computer generated Visual and Animated Demonstrative Exhibits

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This guide lists the common types of computer generated visual exhibits available to support your legal team, as well as an indication of the ways they can be used. The typical juror now gains everyday information from primarily graphic sources such as television, magazines, movies, and the Internet, rather than from books, radio, and newspapers. Perhaps because of this, attention spans for purely verbal information appear to be declining at the same time as the bar for visual presentations is being set ever higher. A clearly argued case will gain force and be better recalled in jury room discussion if explained, and important points emphasized, by professional visual demonstratives.

The writer will not cover specialized programs such as Trial Director or Sanction, as this guide is intended to be relevant for trials or hearings that require between one and one hundred visual demonstratives. Nor does it cover the more exotic types of computer generated presentations including physical simulation, custom interactive media, crash reconstruction, or multiscreen projection. StudioCruz is happy to discuss these individually as required.

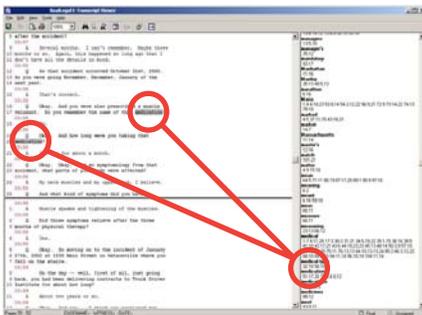
First, we will look at the various types of computer generated illustrations, animations, videos, etc. Then we will compare the ways in which they can be shown: for example, on projectors, printed boards, or handouts. The guide will conclude with a brief examination of how these all come together on the day.



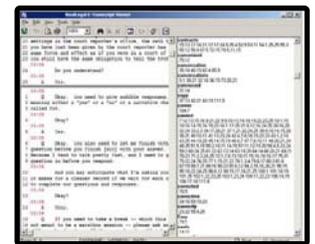
## 1 Types of visual demonstrative

### Enhanced text

Most counsel will be familiar with deposition transcripts provided as an enhanced text file, with a sidebar of links showing occurrences of relevant words as hyperlinks that jump to the point of the deposition in the main window when clicked upon. This can be used to support presentation of a case in two ways:



First and left, a screenshot of an enhanced text showing the alphabetized list of words on right; these jump to the relevant points in the deposition text on the left. This can be shown on screen and then zoomed in to suitable magnification for visibility as Counsel explains the relevance of the passage.



Second, enhanced text can be used for fast navigation within up to a three hour video deposition. The images outlined in black above show both screens of the operator's computer setup. The video deposition is on the left monitor, enhanced text on the right. Only the video is projected to the courtroom screen

(shown to left); the operator uses the enhanced text on the right to locate the relevant section in the video at Counsel's instruction. He is then able to move the playback head rapidly to the relevant section on the video and start it playing.



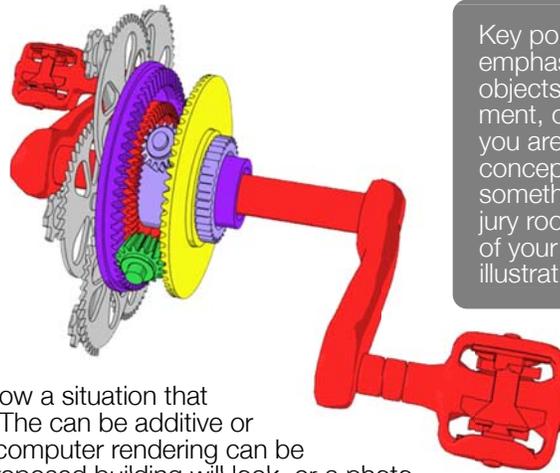
Key points: will an important witness be unable to attend? Do you need to refer to selections from their video testimony to support your argument? Then use enhanced text with the video.

## Illustrations

Illustrations can be drawn by Counsel on a flip pad or an Elmo projector, hand drawn by a professional artist and printed on large format boards or projected, or computer generated. There is no substitute for drawing in “real time” in front of a jury on a flip pad, but Counsel’s artistic skill and the complexity of what needs to be presented may limit the options.

Because the individual style of a traditional illustrator’s work can distract from content, and because last minute revision is often required during the preparation of visual demonstratives, hand drawn diagrams have been losing ground to computer generated illustrations. The latter, which can be amended and emailed rapidly, are more suited to the repeated rounds of review common in pretrial situations. Colors, emphasis, layout, and text callouts can be changed within seconds. In addition the style of the illustration - “hand drawn”, cartoon outlined, flat shaded, or photorealistic - can be changed even after the content has been completed.

Digital files may be saved as password protected Adobe Acrobat files for security during email transmission. Once finalized, digital illustrations can be printed as large format display boards, large format prints for flip charts, letter size hand-outs, or projected on screens.



Key points: do you need to explain or emphasize the spatial relationship of objects, elements of a written document, or a sequence of events? Is what you are communicating an abstract concept? Do you want to give the jury something to take with them into the jury room that will bring the key points of your argument to mind? Digital illustrations are a way to do this.

## Edited photographs

A photograph that has been altered to show a situation that does not exist is called a photomontage. The can be additive or subtractive: that is, a drawing or realistic computer rendering can be added to a photograph to show how a proposed building will look, or a photograph of an actual scene can be altered to show how that scene would look if an object was removed (or how it looked before that object was placed there). Photomontages are most effective when used in a slide show and switched between the before and after conditions. This reassures the viewer that only the relevant parts of the photograph were changed and highlights the effect of that change. Using a 3D computer modeling program to produce the new elements in an additive photomontage has the advantage that its accuracy is provable.

Additive photomontages are best suited to proposed structures under planning review, sightline analysis, explanatory text callouts, and overlaid diagrams. Subtractive photomontages are less common, but can show loss of amenity through removal of recent constructions if no historic photograph is available. Graying out or reducing contrast on other sections helps focus attention upon the most relevant parts of an image.

Additive (left) and subtractive photomontages; original photos are on top.



Key points: do you need to focus attention on part of a photograph, or show how something in a scene changed from the past, or will change in the future? Does this need the convincing nature of a photograph rather than an illustration? If so, a photomontage or digitally edited photograph will be useful

## Computer animation

Animation is the computer technology that has moved furthest in recent years, and is now affordable for both plaintiffs and defendants in all but the smallest cases. Computer animation can be split into two types:

### Computer animation - 2D animation

The simplest 2D computer animation can be thought of as the equivalent of a series of drawings succeeding each other on the screen so rapidly that the viewer perceives the slight differences between the drawings as movement. The advantage of animation over a diagram is that it unambiguously demonstrates the action of a mechanism or the development of an event over time. Complex sequences can be repeated as many times as required. Sound effects, narration, and interactivity can be added. Animations are differentiated from slideshows (such as PowerPoint presentations) by being based on one image and having a far greater range of options for displaying movement and for playing back in front of viewers.

Suitable subjects for 2D animation include mechanisms and industrial processes, timelines, comparison of before and after photographs, and overlaying information on photographs. Animations are commonly shown as Flash or QuickTime files, with easy controls to play, pause, or scrub (move the playback head) rapidly back and forth through the file.

Key points: do you need to show the action of a mechanism or a timeline of events? Is realism not needed or a distraction? Then consider some form of 2D animation.

### Computer animation - 3D animation

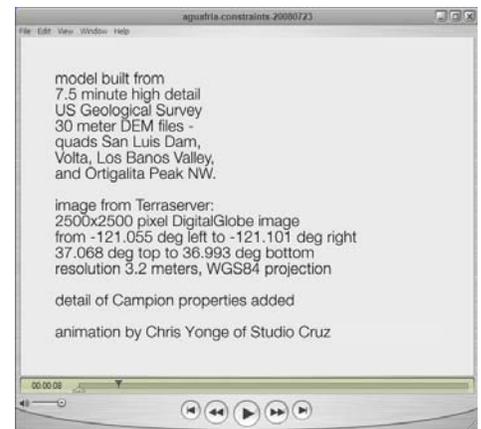
3D computer animation is so called because the results are developed from three dimensional models built inside the computer. There are several stages in the making of a 3D animation. These include

- 3D model building in a specialized computer program
- texturing (adding colors and realistic textures)
- lighting/camera creation and adjustment
- animation of the models and cameras
- rendering (creating a series of images that will be combined in the animation)
- editing (combining the still images, adding titles, compiling scenes)
- compression (reducing the edited file's size a hundredfold, without perceptible loss of video quality, to make it playable on a laptop computer)

Early stages can be edited and refined subsequent to draft review without having to go through all the succeeding steps in full. This is the power of computer animation, that it is so completely editable. In 3D modeling - as compared to 2D animation - the underlying 3D models offer the advantage of being provably accurate. This is also true of renderings produced from virtual cameras in the scene, and this provable accuracy can be of particular value in sightline and shadow analysis.

It is of vital importance as a result that animation files are developed and documented in a systematic manner.

Examples of 3D based animations by Studio Cruz; all are shown within QuickTime frames, though in a court setting would be shown full-screen.



An example of data used in an animation being referenced on screen.

Key points: do you need to reconstruct the scene of an accident or show how a complex mechanism failed? Do you need to set a sub-assembly in context and show how it interacts with others? Does your argument center upon how things move or relate to each other in space? If so, a 3D based computer animation will be useful.

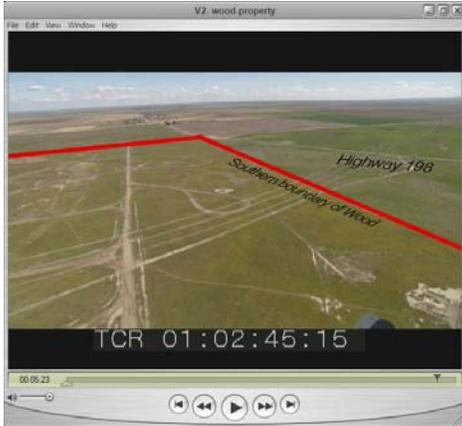


## Video

Videography covers the gamut from “human interest” Activities of Daily Living documentaries (sometimes called Day in the Life), though factual video depositions and records of accident scenes, to aerial movies of property overlaid with property line and topographic data illustration that matches the ground movement (known as match moving).

One element of courtroom video that is frequently overlooked is that it is unnecessary to use high resolution imagery, and indeed that this can be a disadvantage due to large file sizes and complexity in editing. Professional videographers may need to be reminded that the results will be shown through an XGA format (1024 by 768 pixel) projector and that higher resolutions, while allowing more freedom during subsequent editing, are not required.

Apart from the obvious case of video depositions it is common to shoot courtroom video without sound, as unintended comments or sounds can lead to successful objections to its use. Counsel should provide narration as the video plays.



Left: an example of an aerial video overlaid with text and match moved property lines.

Key points: is it important to give your jury the atmosphere of a location, to take them on a tour even if this cannot be done in reality? Do you need to show them how an injury affected an accident victim's daily life, and how painful the required medical procedures are? Then a video is the answer.

## Large format printed boards

Design costs will in part depend upon whether the demonstrative is simple or complex. A simple illustration, for example, can be created in Adobe Illustrator, and the size of the resulting print makes no difference. The cost to adjust a photograph, however, depends upon its resolution (number of pixels), and the larger the more expensive. The board should be readable by the juror furthest away from it; shortsighted jurors will appreciate also being given small copies of important exhibits. Attention should also be given to adequate lighting and to minimizing reflections from windows and light sources.

The maximum practical board size is 48" wide by 72" high, being the largest size that can be carried comfortably and safely by one person. These are effective when placed upon an easel and used with a pointer by Counsel or expert witness.

Printing costs will vary depending upon the dimensions, the quality of paper upon which the exhibit is printed, whether a protective laminate layer is added, the backing material, and so forth.



Key points: large format boards when used with a traditional pointing stick give Counsel or expert witness a schoolteacher's authority. Use them when all eyes need to be upon you. Large format boards are not good for presenting complex images; they are best used to illustrate the broader aspects of an argument. Some jurors may have trouble seeing detail or colors yet be unwilling to admit it.

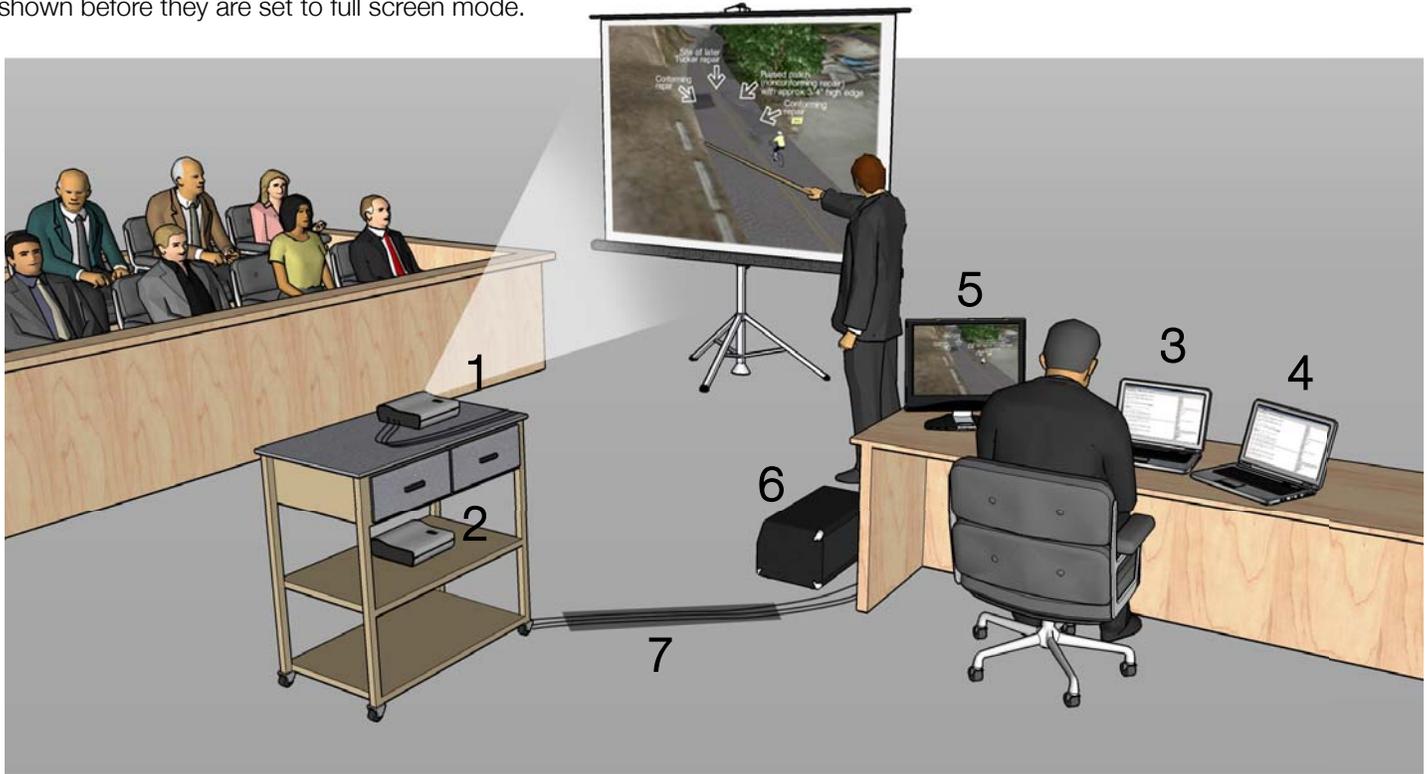
## Small format prints

Large graphics can be repurposed (generally by means of adjusting font size) to be provided as small handouts to the jury that they may refer to throughout the trial as well as take with them into the jury room.

## Projector and computer

A useful projection format is XGA, or 1024 pixels wide by 768 high. This is well suited to displaying detailed images but is a small enough format to allow easy projection of 30 frame per second video from mainstream laptop computer graphic cards. Too large a size will clog the card and cause stuttering or – worse – freezing of the presentation program. Too small a size will not have sufficient detail.

It is useful to have a review monitor of the same screen ratio as the projector fed from the projector's output. This allows a presentation to be set up with the cap on the projector, avoiding the visual clutter and distraction of presentations being shown before they are set to full screen mode.



Above: a well set up projection installation, including (1) projector, (2) backup projector, (3) laptop, (4) backup laptop running duplicate presentation, (5) review monitor showing image sent to projector, (6) amplifier/speaker, and (7) cables taped to floor.

## DVD player

The writer does not favor the use of DVD players for courtroom presentation due to the time they take to start together with the limitations of the DVD format for search and for frame by frame review. A useful trick, if they are to be used along with computer based formats, is to copy the DVD files on to the hard drive of a laptop. They can then be played with less delay than from the laptop's DVD drive. Better, however, is to play the more flexible AVI, MPG, or QuickTime computer formats.

## Large screen television

Large screen televisions are a mixed blessing in a courtroom. On the plus side, the fact that they have integrated speakers and can be seen clearly in daylight means they make for simple installation. No projection screens, no external speakers to hook up, no focusing. The downside is that they are expensive, delicate, heavy, and you need two or three to make sure the entire jury plus the judge can see them clearly – not counting Counsel and witnesses. Moving and running cables to these can be a major exercise in a small courtroom.

## Jury box monitors

It is increasingly common to find jury boxes fitted with flat screen monitors. This is a mixed blessing. While Counsel can stand beside drop-down and tripod mounted screens and be sure of attention being paid to his/her words as well as the images, if jurors' heads are bowed down over screens one does not know what message they are receiving – if any. In addition monitors must be checked regularly for functionality and color accuracy. For these reasons the writer does not recommend using jury box monitors even when available.

## Speakers and sound systems

Courtrooms are designed to have good acoustics and there is control of noise. As a result a powerful sound system is not needed. The only important criterion is that it be capable of reproducing speech clearly and be simple to set up.

### 3 On the day

#### Prequalification of exhibits

You don't want to slow down a trial by being faced with objections to demonstrative exhibits. Prequalify demonstrative exhibits before using them in direct examination:

- Disclose demonstratives to opposing Counsel before trial;
- If you are met with objections, file a motion in limine seeking the introduction of the exhibit;
- If you do not want to give your opponent advance notice or do not have your exhibit ready before trial, disclose it at some point before its use in direct examination, outside the hearing of the jury.

Such advance qualification of demonstrative exhibits will insure that you can keep the trial moving without sidebars or breaks requiring the jury to leave the courtroom.

#### Courtroom presentation

A competent courtroom technician will attend with redundant (duplicated) hardware, including laptops, projectors, and DVD players. The laptops will have full installations of the programs necessary as well as all work files, and will be kept in synch throughout the proceedings. He will have extension cables, multiple gang outlets, and adapters to connect with the court's video system (if present). He will know to switch off the laptops' screensavers and power saving options, and will have no potentially distracting programs running in the background that can pop up a warning at an inconvenient time.

Ask your prospective technician about the worst thing that happened to him in a courtroom. If he says spilling his coffee, reconsider your alternatives. You want someone who's made all the mistakes – and learned how to recover from them – when previous clients were paying him. You want someone who can recover from a technical problem fast and effectively when everyone is looking at him. That trial or hearing is a one time only event for you and your client.

Finally, it is most efficient if your courtroom presentation specialist also produced the exhibits and can do double duty as an expert witness on the subject.

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Chris Yonge is principal of Studio Cruz, and an animator, designer, and court tech of long standing. All illustrations, animations, and videos shown were created by Studio Cruz.