Demonstrative Evidence to Visual Persuasion
by Ernie Svenson

ABSTRACT

Visual information is easier for the human brain to process, and is remembered for longer periods of time. There are constraints to the use of visual information in court proceedings. But there are powerful reasons for using visuals to help jurors and others understand key facts faster and better.

INTRODUCTION

On September 27, 1980, at approximately 1:30 p.m., Edward Burke was killed when his car going southbound on Weston Blacktop Road in Weston, Illinois, collided with defendant’s westbound train.\(^1\) Three sets of tracks crossed Weston Blacktop Road: the Toledo, Peoria & Western main line, a spur track, and a switch that split off as a third track. The crossing was marked by a circular yellow “RR” warning sign along the road, a white “RXR” painted on the pavement approaching the crossing, and two standard crossing signals each equipped with four lights. It was undisputed that at the time of the accident, the lights were operating. Prior to the accident, however, the flashing lights had on occasion been activated when no train was present.

After a lengthy trial with multiple witnesses testifying to speeds, distances, and sounds, the Circuit Court entered judgment on a jury verdict in favor of the railroad company.\(^2\) Mr. Burke’s widow appealed, arguing that the court erred in permitting certain demonstrative evidence to be viewed by the jury. Specifically, the plaintiff challenged the presentation of four items of demonstrative evidence: (1) a railroad crossing standard equipped with crossbars and flashing lights; (2) a hand-drawn diagram of the accident site; (3) five photographs, taken one year after the accident, depicting the visibility of the train’s flashers from various distances; and (4) a white plastic “X” demonstration of the markings visible on Weston Blacktop Road.\(^3\) Noting that “courts favor the use of demonstrative evidence to help the jury better understand the issues in the case,” the Appellate Court affirmed the lower court’s decision, finding the demonstrative evidence effective not only for the jury, but also in assisting eye-witnesses in describing the scene of the accident.\(^4\)

Over the past half-century, modern court procedure has continued to prove that with the right tools in the toolbox, a skilled attorney can bridge the gap in communication failures between lawyers, judges, and jurors. Demonstrative evidence rests on the premise that people remember what they see far better than what they hear. Normally complex issues lead to “pervasive communication gaps that render jurors ‘bored and confused’ and lead them to ‘misunderstanding key legal concepts’ [that] protect neither the defendant’s constitutional rights nor the public’s legitimate interest in justice.”\(^5\) Modern demonstrative evidence, however, bridges this gap through graphics and video, resulting in judges and juries who are far more comfortable with complex issues.

Demonstrative evidence is typically evidence in the form of a visual representation of an object. This is, as opposed to real evidence, testimony, or other forms of evidence used at trial. Examples of

\(^2\) Id.
\(^3\) Id. at 213.
\(^4\) Id.
\(^5\) Fred H. Cate & Newton N. Minow, Communicating with Juries, 68 IND. L.J. 1101, 1114 (1993) (quoting Theodore D. Ciccone, President of Litigation Communications, Inc.).
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demonstrative evidence, described in more detail below, include photographs, x-rays, videotapes, movies, diagrams, forensic animation, maps, drawings, graphs, animation, simulations, and models.

A large body of scientific evidence supports the proposition that visual displays communicate complex information more powerfully than oral communication alone. Of the three primary learning styles—visual, auditory, and kinesthetic—most people are primarily visual learners. Essentially, people learn more effectively when they are shown pictures.

One study of juror memory retention found a 100 percent increase in juror retention of visual over oral presentations and a 650 percent increase in juror retention of combined visual and oral presentations over oral presentations alone.\(^6\) Neurophysiologists believe that fully one-third of the human brain is devoted to vision and visual memory.\(^7\) The message, which must not be lost on courts, is clear: for jurors to understand and remember what a complete case is about, they must be shown as well as told.

This paper addresses the legal implications of the use of demonstrative evidence at trial.

Part I of this paper addresses the general procedural requirements and limitations of both federal and Texas state courts.

Part II of this paper addresses specific examples of demonstrative evidence as well as specific rules of admissibility for those items.

Part III of this paper briefly addresses some of the scientific reasons why visual evidence is so powerful in persuading people.

Part IV of this paper concludes that visual demonstrative evidence should be used as much as possible if you want to dramatically improve your odds of persuading jurors to accept your arguments.

I. Demonstrative Evidence: Rules Governing Use in Court
   A. Rules of Evidence

   1. Federal Rules of Evidence

   Federal Rules of Evidence 611 and 1006 specifically govern the admission of demonstrative exhibits. Non-substitute or pedagogical summaries—demonstrative evidence which facilitates the presentation of evidence or helps explain the evidence already in the record—are admitted under Rule 611, which affords the courts “control over the mode … [of] presenting evidence.”\(^8\) Substitute or summary evidence—demonstrative evidence which has no independent existence—is admitted under Rule 1006.

   Summary exhibits under Rule 1006 can be substituted for actual evidence “to prove the content of voluminous writings . . . that cannot be conveniently examined in court.”\(^9\) Under this rule, a proponent of a summary exhibit must satisfy four elements for admission: (1) the summarized material must be “voluminous” and not conveniently subject to examination in court; (2) the summary or chart must be an

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\(^8\) Fed. R. Evid. 611.

\(^9\) Fed. R. Evid. 1006.
accurate compilation of the voluminous records; (3) the records summarized must be otherwise admissible into evidence; and (4) the underlying documents must be made available to the opposing party for examination and copying.¹⁰

Like all other evidence, demonstrative evidence must also satisfy the mandates of Rules 401 – 403, must avoid improper hearsay or satisfy an exception, must be properly authenticated, must be based on personal knowledge of the testifying witness, and must pass the criteria in Rules 701 or 702, to the extent it includes opinion testimony.¹¹

### a. Relevance

Demonstrative evidence must be relevant under Rules 401 and 402. It must be helpful to the factfinder and have a tendency to “make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.”¹² In addition to relevance concerns, demonstrative evidence must also possess a probative value that is not substantially outweighed by the dangers of unfair prejudice, issue confusion, misleading the jury, undue delay, waste of time, or needless duplicity.¹³

### b. Hearsay

A demonstrative summary exhibit cannot summarize or include inadmissible hearsay, and the hearsay exceptions contained in Rules 803 – 804 are equally applicable when dealing with demonstrative exhibits.¹⁴ Invoking the business records exception obligates the proponent to lay a proper foundation, not just for the summary exhibit itself, but also for the underlying records. Rule 803(6) requires a custodian to testify that the records were made contemporaneously with the events and prepared and maintained in the course of a regularly conducted business activity.

### c. Opinion Testimony and Authentication

Courts usually require that opinion testimony evidence be presented elsewhere on the record before it can be used in a demonstrative summary.¹⁵ Rules 701 and 702 govern the admission of opinion testimony for lay and expert witnesses, respectively. In order for a demonstrative exhibit to include lay witness opinions, it must be based on their own perception and helpful to understand the witness’s testimony or determine a factual issue.¹⁶ Expert opinion testimony requires a qualified witness under Rule 702.

### 2. Texas Rules of Evidence

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¹² Fed. R. Evid. 401.
¹³ Fed. R. Evid. 403.
¹⁴ See e.g., United States v. Samaniego, 187 F.3d 1222, 1224 (10th Cir. 1999) (“The obligation of establishing the applicability of a hearsay exception for [summarized] records falls upon the government as the proponent of the evidence.”).
¹⁶ Fed. R. Evid. 701
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Similar to the Federal Rules, the Texas Rules of Evidence provide several tools to control the use and abuse of demonstrative evidence. For example, Rule 403 dictates that visual or demonstrative evidence is admissible if it tends to resolve a relevant issue, as long as its probative value substantially outweighs the danger of unfair prejudice.\(^\text{17}\) Evidence is relevant if it has the tendency to make the existence of any fact that is of consequence to the determination of the action more probable or less probable than it would be without the evidence.\(^\text{18}\) To establish the relevancy of demonstrative evidence, the proponent must first authenticate it.

The proponent is then required to establish that the evidence is fair and accurate and that it helps the witness to demonstrate or illustrate the witness’s testimony. In weighing the probative value of the evidence against the danger of unfair prejudice, the court must first examine the necessity for and probative effect of the evidence.\(^\text{19}\)

Considerations of unfair prejudice include an unduly emotional reaction, confusion of the jury, or a waste the court’s time. The matter of admissibility, however, rests in the trial court’s discretion, and Texas courts have ruled that a lower court’s rulings will not be disturbed on appeal absent a palpable abuse of discretion.\(^\text{20}\)

In some cases, a jury may properly examine demonstrative evidence that is admitted in evidence.\(^\text{21}\) However, courts are split over whether demonstrative evidence should be sent to the jury room for deliberations. While the majority rule seems to preclude demonstrative evidence from going to the jury because it is “not evidence,” the matter is often left to the trial judge’s discretion with input from the attorneys.

Although some argue that the starting point may be to withhold it from the jury, it is important for courts to recognize that there may be instances where the jury will benefit from the ability to view demonstrative evidence during deliberations, just as it did throughout the other phases of trial.

II. Types of Demonstrative Evidence

In general, demonstrative evidence should not be used as a substitute for, or in lieu of, testimonial or direct evidence. Demonstrative evidence should be used in situations where the spoken word cannot clearly convey the point to be made. There are five broad purposes warranting the use of demonstrative evidence: (1) to summarize testimony; (2) to explain scientific, technical, or complicated information; (3) to help jurors retain more information; (4) to reinforce information crucial to the case; and (5) to refresh jurors’ memories and/or keep them interested in long trials.\(^\text{22}\)

A. PHOTOGRAPHS

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\(^{17}\) Smith v. East, 411 S.W.3d 519, 530 (Tex. App.—Austin 2013, pet. denied); Tex. R. Evid. 403; In re C.J.F., 134 S.W.3d 343 (Tex. App.—Amarillo 2003).

\(^{18}\) Tex. R. Evid. 401; In re C.J.F., 134 S.W.3d 343 (Tex. App.—Amarillo 2003).

\(^{19}\) Id.


\(^{21}\) Collier v. State, 164 Tex. Crim. 91, 297 S.W.2d 160 (1956).

\(^{22}\) Frank L. Branson, 4 Litigating Tort Cases § 42:2, “Demonstrative evidence”: Origins and Purpose, Demonstrative and Documentary Evidence in Contemporary Tort Litigation, June 2017.
Photographs can be obtained from multiple different sources, including the police or sheriff’s department, the fire department, newspapers and television stations, or the medical examiner’s office. Often, family members of the victim may have photographs that will be useful in presentation at trial. Further, medical providers often take photographs of the victim.

Photographs may also be used as a “silent witness.” The “silent witness” doctrine permits the authentication of photos through a showing of the reliability of the process used to take and develop the photos, even though no witness is available to confirm first-hand the accuracy of the photo’s depiction of events. For example, a surveillance camera might record a defendant’s robbery of a store. Although no store employee has firsthand knowledge of the incident, the videotape’s authenticity can be established through testimony describing how and where the cameras were placed and the steps taken to ensure the accuracy of the recorded images.

The admissibility of a photograph is governed by Texas Rule of Evidence 901(a) which states, “The requirement of authentication or identification as a condition precedent to admissibility is satisfied by evidence sufficient to support a finding that the matter in question is what its proponent claims.” The admissibility of a photograph “is conditioned upon its identification by a witness as an accurate portrayal of the facts, and on verification by that witness or a person with knowledge that the photograph is a correct representation of such facts.”

The admissibility of a photograph is governed under an abuse of discretion standard, and the trial court abuses its discretion only if it acts without reference to any guiding rule or principles such that its decision is arbitrary or unreasonable.

The photographer does not have to lay the predicate for admissibility, rather the person photographed, a person present when the photograph was taken or any witness who observed the scene or the object photographed, in addition to the photographer, may lay the predicate for admissibility. Further, a change in the object or scene photographed will not render an earlier photograph of the object or scene inadmissible, so long as “the changes are explained such that the photograph will be helpful to the jury in understanding the nature of the conditions at the time of the controversy.”

In personal injury cases, photographs can be used to show a Plaintiff “before” and “after” the incident in question. Similarly, x-rays can be helpful in cases involving medical issues. X-rays can be used in conjunction with medical illustrations to explain expert testimony and help the jury understand the significance of the X-ray.

The admissibility of x-rays are governed by Texas Rules of Evidence 1001(b). An X-ray is authenticated by testimony showing that the X-ray process used to produce the X-ray produces an accurate result. A physician or X-ray technician can testify to the process used to take and identify X-rays.

27 Photographs include still photographs, X-ray films, video tapes, and motion pictures.
B. OBJECTS, ARTICLES, AND SUBSTANCES

In criminal cases, weapons or objects that are not those allegedly used in committing the offense, but are similar to or illustrative of those allegedly used, can be utilized as demonstrative evidence under certain conditions.\(^\text{29}\) Trial courts have the discretion to admit into evidence instruments of a similar type to the one used in the commission of an offense where the exemplar is relevant and material to an issue in the trial and is not overly inflammatory, and the original, if available, would have been admissible at trial.\(^\text{30}\)

Specifically, such a weapon or object may be admitted if: (1) the original is not available; (2) if available, the original would be admissible; (3) it is relevant and material to an issue in controversy; (4) its probative value outweighs any inflammatory effect; and (5) the jury is instructed that the object is not the object used in the commission of the crime and is to be considered by the jury solely as evidence that demonstrates or illustrates what the object used in the offense looks like.\(^\text{31}\)

C. EXPERIMENTS, TESTS, AND DEMONSTRATIONS

Experiments, tests, and demonstrations that are portrayed or conducted in court are another type of demonstrative evidence.\(^\text{32}\) Experiments or tests that have been conducted out of court can be portrayed in court by video and still photography and, in that way, constitute demonstrative evidence. Evidence of both in-court and out-of-court experiments and demonstrations must be properly identified and authenticated in order to be admissible.

Generally, the proponent of a demonstration must show that the conditions under which the demonstration is conducted are substantially similar to the event in question.\(^\text{33}\) It is not essential that the conditions of the demonstration be identical; rather, the dissimilarities go to weight and not to admissibility.\(^\text{34}\) It is the discretion of the trial court to determine if the dissimilarities will serve to confuse rather than aid the jury.\(^\text{35}\)

D. GRAPHS, CHARTS, AND TABLES

Charts and graphs are equally helpful in presenting complex issues involving data or measurements. Although neither is specifically governed by the Texas Rules of Evidence, case law indicates that Speier v. Webster College is the controlling precedent.\(^\text{36}\)

In Speier, the Texas Supreme Court was asked to decide if the trial court erred in allowing the plaintiff to admit into evidence a chart reflecting testimony on damages. The chart had blanks for each plaintiff and each element of damage. As each plaintiff testified, the attorney filled in the blanks to reflect


\(^{32}\) Van Arsdale, et al. at § 833.


\(^{34}\) Id.

\(^{35}\) Id.

\(^{36}\) 616 S.W.2d 617 (Tex. 1981).
the testimony of the plaintiff. The court admitted the exhibit into evidence after the chart had been completely filled in.

According to the Court, “We recognize that such summaries are useful and oftentimes essential, particularly in complicated lawsuits, to expedite trials and to aid juries in recalling the testimony of witnesses.”

Charts summarizing testimony are admissible subject to the trial court’s discretion; likewise, charts utilized by an expert depicting data are admissible so long as the expert testifies to the truth and accuracy of the data.

Timelines, a type of chart, are also a useful type of demonstrative evidence. The Texas Supreme Court in *Uniroyal Goodrich Tire Co. v. Martinez* held that the trial court did not abuse its discretion in allowing into evidence a timeline outlining the testimony of an expert. Relying on its decision in *Speier*, the Court noted, “Charts and diagrams that summarize, or perhaps emphasize, testimony are admissible if the underlying information has been admitted into evidence, or is subsequently admitted into evidence.”

Similarly, a table diagrams a complex idea and helps viewers understand the relationship between its various parts. By breaking the idea down into its parts and clearly labeling them, a table helps the viewer more easily grasp the verbal explanation. As with other types of demonstrative evidence, seeing the material laid out visually makes it much easier to understand the overall structure of the argument and pick out the provisions that apply under the facts. Tables contain column headings which guide the reader through the material and highlight what’s important. Visually separating main ideas and including signposts to what’s important provides a powerful tool for assimilating an argument.

## E. COMPUTER GENERATED DEMONSTRATIVE EVIDENCE

With technology continuously advancing, computer-generated graphics and reenactments have risen in popularity and effectiveness. However, for a computer animator expert’s testimony to be admissible, the animator must be qualified, and his opinion must be relevant to the case and based upon a reliable foundation.

Once the expert’s qualifications are established, it must be shown that the expert’s testimony is relevant and reliable. To meet the relevance prong, the expert’s testimony must be sufficiently tied to the facts of the case that it will aid the jury in resolving a factual dispute. The reliability prong is established if the expert’s testimony is grounded in the methods and procedures of science. The trial court’s ruling on the admissibility of computer-generated animation is reviewed under an abuse of discretion standard.

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37 Id. at 618-19
38 Id.
39 977 S.W.2d 328, 342 (Tex. 1998) (on rehearing).
40 Id.
42 Id. at 742.
43 Id.
44 Id.
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Historically, only certain complex cases involving large damages provided justification for the initial use of computer graphic animations and then only as demonstrative evidence. This changed with the Aug. 2, 1985, crash of Delta Flight 191 at Dallas/Ft. Worth Airport.

During the resulting 14-month trial, Delta Air Lines sought to place blame for the crash on air traffic controllers. Lawyers for the United States made legal history by placing into substantive evidence—for the first time in a reported federal decision—what was perhaps the most sophisticated computer graphic animation used yet in a trial.45 The bench decision favoring the United States included more than a dozen references to the computer graphic animation in support of key findings of fact. It subsequently was affirmed on appeal.46

Cost and production time barriers that used to limit computer graphs have been broken. Advances in computer software have brought computer graphics and animation within the litigation budget of all but the smallest cases. The vast majority of computer graphics and a significant part of computer animations can be produced on laptops, tablets, and a number of other electronic devices.

Computer graphics can transform complex fact patterns or technical data into comprehensible visual evidence. They can be used to highlight witness or expert testimony, explain the theory of a case, and present alternate scenarios of an incident without the expense of physical re-creation.47

3D printing is yet another form of computer technology that can help create demonstrative evidence to be used during trial. 3D printing involves using a printer to create 3D scale models. This technology is especially appealing in cases involving complex issues.

For example, an interactive 3D model of a ruptured spleen is likely much more effective in showing the damage than a simple picture from a textbook. Likewise, a 3D model of a construction site which showcases the site’s defect is also more effective than showing a photograph of the construction site on a PowerPoint slide.

Computer generated animations are admissible if used to summarize testimony of an expert.48 In Emmons, computer-generated animation—intended to depict the testimony of an expert witness concerning the sequence of events of an accident—was admitted into evidence over the objection of defense counsel.

According to the court of appeals, “Video animation and other demonstrative evidence which 'summarize, or perhaps emphasize, testimony are admissible if the underlying testimony has been admitted into evidence, or is subsequently admitted into evidence.”49

III. Visual Persuasion: Brief Overview of Key Scientific Underpinnings

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46 Krieger at 92.
47 Id.
49 Id. (quoting Uniroyal Goodrich Tire Co, 977 S.W.2d at 342).
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The subject of persuasion was being closely studied as far back as Aristotle. But the idea that the use of visuals can dramatically help with persuasion is a fairly new one (e.g. the popular adage that “a picture is worth a thousand words.”). Scientific studies confirm the truth behind this adage.

First, it’s been discovered that the human brain processes images thousands of times faster than text. Studies show that the human brain is optimized for processing visual information.

Importantly, visual information has been shown to be much easier to remember than other types of information. For example, “if information is presented orally, people remember about 10% when tested 72 hours after exposure. That figure goes up to 65% if you add a picture.”

As one scientific author observes: “Visuals seem to win memory space because we have a reflexive preference for them. We are visual beings: we take the world in mainly through visual receptors. Pictures are often more enjoyable and help us arrive at meaning more quickly.”

Why is it easier to remember visuals?

Here again, Ms. Simon’s book is helpful in understanding: “When comparing the impact of words versus images on memory, cognitive scientists have offered a theory called dual coding...If we see a picture of a banana it is easy to encode it twice: a code for the visual we see and a verbal code we generate quickly because the picture is easy to label.”

There is little question that visual information can help people better understand and better remember. The question is how can attorneys make better use of visuals in court?

The short answer is this: devote yourself to studying the practice of using visuals—especially computer-generated visuals such as can be used with Microsoft’s PowerPoint software or Apple’s Keynote program. There are many helpful books, but the ones I most recommend are these:

- *Brain Rules*, by John Medina
- *Impossible to Ignore*, by Carmen Simon
- *Presentation Zen*, by Garr Reynolds
- *The Back of the Napkin: Solving Problems and Selling Ideas with Pictures*, By Dan Roam

I also recommend taking the opportunity to give presentations outside of court to practice the art of using slide decks effectively. Too many presenters use PowerPoint ineffectively, so it’s best not to copy what you mostly see.

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50 *The Art of Rhetoric*, Aristotle (4th Century B.C.)
51 *Persuasion and the Role of Visual Presentation Support: The UM/3M Study*, D.R. Vodel, G.W. Dickson, and J.A. Lehman (June 1986) (found that “presentations using visual aids were found to be 43% more persuasive than unaided presentations)
52 *Attention, Perception, and Psychophysics*, B. Wyble, C. Hagmann, and E. McCourt (findings described in news.mit.edu/2014/in-the-blink-of-an-eye-0116
54 *Impossible to Ignore*, Carmen Simon, Ph.D., at page 160.
55 *Impossible to Ignore*, Carmen Simon, Ph.D., at page 162.
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The time invested in understanding the “grammar” of good visual presentation is well worth the effort, especially if you are trying to communicate better and be more persuasive.

IV. Conclusion

Lawyers should make more use of visuals in court proceedings and negotiations. Use of visuals in court are governed by court rules and the Rules of Evidence.

But as more people become aware of scientific studies establishing the benefits of visual information courts will probably become more receptive to allowing its use in trial. Provided, of course, that attorneys use visual evidence effectively and responsibly.

The best way to learn to use visual information is to actually use it. The best preparation for using visual is to read the books I mentioned above. And if you come across people who are adept at using visuals study their techniques as well.

In short, it’s probably better to observe a good visual presentation than to read about what it’s like. Go figure.