

Arizona DOT Planner Tells How to Make Quality Slides—'Quick and Cheap'

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Communication plays an important role in today's expanding field of transportation planning and research. Often, communication is made through visual aids such as charts, overhead projectors, and 35mm slides, which not only enhance presentations but also better communicate thoughts and ideas. As a planner for the Arizona Department of Transportation, I am often called on to develop slide programs dealing with various transportation issues. Deadlines are sometimes stated, "Yes, I want it today; if I wanted it tomorrow, I would ask for it tomorrow." Too often, this is the case. Having gone through several rush slide productions and last minute changes, I have developed three

Feature

methods of creating quality color slides that are not only timely, but economical as well. Commercial prices may start at \$20.00 per slide and may take a few days to produce. After initial art work has been prepared, I can produce presentation-ready slides in a matter of hours or even minutes depending on the quantity and at a much lower cost.

USING MICROCOMPUTERS FOR SLIDES

The first method is through the use of a microcomputer. The Arizona Department of Transportation, through a federal grant, has acquired several microcomputers and software programs. Programs such as Wordstar and Screenwriter create text; VisiPlot and dGraph produce charts and graphs. Graphics Magician and Executive Briefing System can fashion almost any type of graphic or text your imagination will allow. These programs and others generate text and graphics in a variety of colors including inverse color. Anything produced on a microcomputer screen can be easily photographed with a 35mm camera. Several companies market devices that photograph slides directly from the computer; however, they are quite costly.

Filming a computer monitor requires a 35mm single-lens reflex camera with a standard or wide-angle lens so that "what you see is what you get." A tripod is also needed. Any slide film will work; however, I recommend Kodak's Ektachrome 200 Daylight film because of its versatility and

because some processors can provide a two-hour developing time. Fast turnaround times can increase processing cost by 100 percent, but it is well worth it for those last-minute changes.

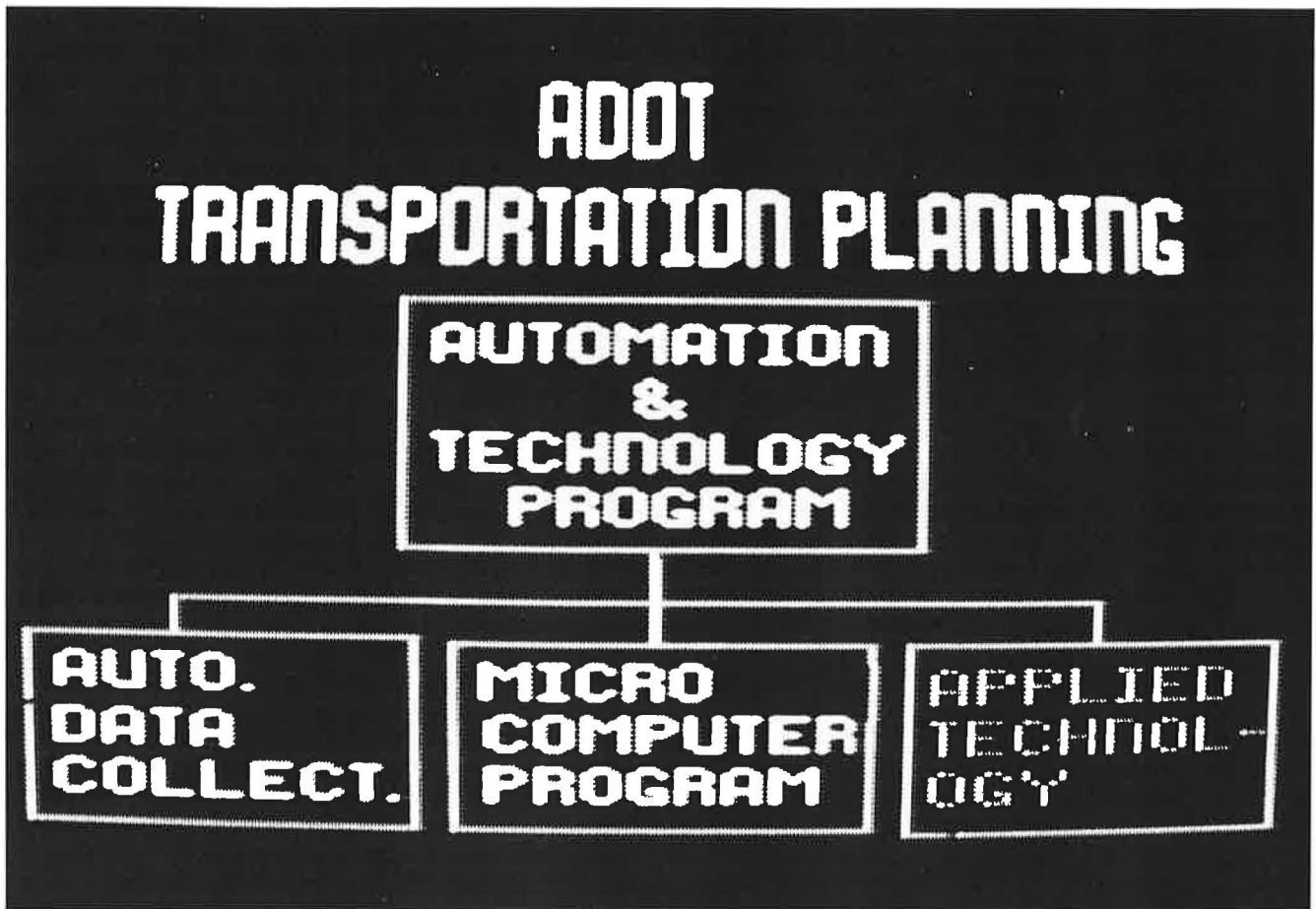
Since most monitors reflect any ambient light, I usually photograph the monitor in an unlighted room. This will eliminate reflection problems and will sharpen images. Glare shields are available for many monitors that may serve the same purpose of the darkened room. A tripod is necessary because shutter speeds must be set at a speed slower than the speed of the scanning lines that move across the screen; I recommend a speed of 1/8 of a second. The distance from the screen will depend on the type of lens being used. For best results, the image on the screen should fill the entire screen. The monitor should be placed so that the camera and tripod can be positioned level and close to the screen.

Obtaining proper exposure is the biggest obstacle; color, tint, hue, contrast, and screen brightness will affect exposure settings and slide quality. The screen should be adjusted so that the image is lustrous. If haloing and glare are evident on slides, the screen should be readjusted. The aperture settings I use range from f/2.8 to f/4 depending on screen adjustment. Shooting a series of test slides helps determine the best exposure for the screen and subject being photographed. This involves shooting and recording several different exposures of a selected image. Once optimum screen adjustment has been achieved, control knobs on the screen should be marked for future reference.

The quality and versatility of microcomputer systems can produce high-quality slides at a fraction of the cost charged by outside companies and in a much shorter time frame. Creating slides from a microcomputer is a relatively simple matter of experimentation and patience.

HARD-COPY ART WORK

The second method I use for slide production is filming hard-copy art work from a copystand. A macro (close-up) lens is usually required to do this type of work. Special filters are available, which screw onto most lenses, that will magnify almost as well as a macro lens. Ektachrome film can be used to film almost any art work, including text, charts, maps, and even photographs. Exposures depend on the amount of light produced by the copystand and the type of art work being photographed. I use a gray card to take an average light reading. I then shoot an exposure over and an exposure under the average to test for the best setting. This system works if colorful art work is being used and time is available to send the film out for processing. However, there is



Some of the major components of Arizona Department of Transportation Planning strategy appear in above photo taken of computer screen graphic.

another method that I am using that allows me to develop the film myself and be independent of a commercial processor.

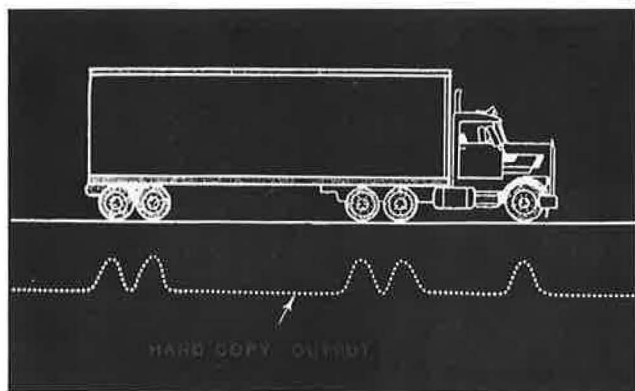
ADDING COLOR

This system, also using a copystand, uses a black-and-white negative film called Kodalith. When developed, the art work photographed will appear transparent and backgrounds will be solid black. Color can be added in various methods. Kodalith is an uncommon film that is usually sold in bulk rolls of 100 feet at a cost of approximately \$20.00 per roll. A device to load the film into canisters can be purchased in the neighborhood of \$15.00. The canisters, costing about 25 cents each, can be loaded with as many as 36 exposures depending on the size of the job. A 36-exposure roll uses 5 feet of film; therefore, twenty 36-exposure rolls will be pulled off the bulk roll. Even considering the initial expense of the loading device, the cost of the film is surprisingly low. Using this system, I have had excellent results in producing color slides expeditiously.

The advantage of Kodalith film is that it can be developed "in house" with basic film development equipment costing under \$50.00. A closet or changing bag is all that is necessary to load the film into the developing canister. The actual processing takes about 20 minutes and can be done where-

ever there is a sink. No special darkroom or lighting is needed. Developing Kodalith film (using A&B developer) is quite simple; there are an unlimited number of books and magazines that give step-by-step instructions. Processing specifications for the film comes in the film box, or can be obtained from any Kodak dealer. After the film is dried and cut, there are a number of ways to add color to the film. I normally apply colored transparent tape or felt-tipped pens to the emulsion(back) side of the film. Because pens are difficult to apply uniformly, I prefer using tape called Formaline. This tape, made specifically for acetate surfaces, is available in various sizes and colors from most art and office suppliers. The tape is best applied with a burnisher to prevent bubbling. I often use a combination of colored tape for my slides. Kodak produces dyes that may also be used to color film, but this method may be tedious. Another method is to use colored acetate sandwiched with the film when inserted in the slide mounts. However, this method may limit the use of multiple colors. Speaking of slide mounts, there is an assortment available, some requiring a mounting tool. I use a simple snap-together mount that has glass inserts. These mounts are reusable, and the glass flattens and protects the film.

Kodalith film does have its limitations. Art work must be solid black, and bold to produce a good image on the film. Colors other than black, typed text, or graphics with thin lines will not photograph well, if at all. Typeset text



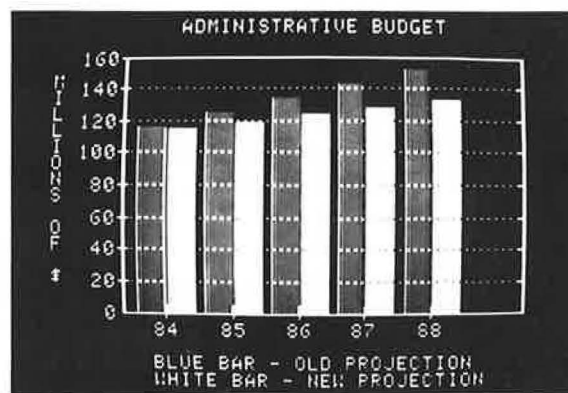
Computer data can generate different types of graphics/illustrations. Shown here is the equivalent of a line drawing. The arrow points to dotted line representative of hard copy output.

generates excellent results. Art work must be photographed on a well-lit copystand since the film speed of ASA 25 is very slow and requires a slow shutter speed. I use a shutter speed of 1/8 of a second and an aperture setting of f/3.5. Exposure settings and developing time may vary depending on the equipment and individual. Again, shooting test exposures will indicate the optimum settings needed.

The initial investment for using the Kodalith film process is relatively low compared with the quality and timeliness the film can provide. Although not state of the art, producing slides with this method is not only cost effective but also enjoyable.

KEEP IT SIMPLE

Creating art work and composing slide presentations can be complicated and frustrating. There are a number of refer-



Bar graph produced by computer is photographed off screen and slide negative is made. Computer produces multicolored graphics. Here the shaded bars are blue in their original state, the others white.

ences on producing slide programs. Kodak's *Planning and Producing Slide Programs* is an excellent source of information. A key guideline to follow is to keep it simple. Audiences cannot or will not read a slide if there is an excessive amount of text or graphics. Large amounts of text should be broken into several slides if necessary. [TRB has also published visual aid quality criteria to govern visual aids to be shown at its meetings. See "Information for Authors," which is updated annually.]

As I create more slide presentations, I am discovering better, shorter, and cheaper methods. However, the biggest discovery that I have made is that I am limited only by my own sense of creativity. With a little planning and a few pieces of equipment, you and your transportation department can make a similar discovery.

(Editor's note: References to specific products are those of the author and do not reflect endorsement by *TRNews*.)

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