

## StereoMirror™ Case Study: Minnesota Department of Transportation (Mn/DOT)

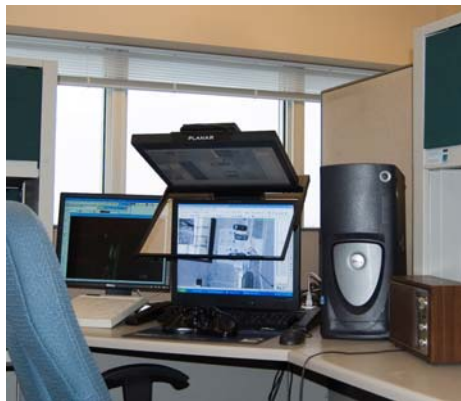
### The Situation

#### The Organization

The Photogrammetric Mapping Unit in the Minnesota Department of Transportation (Mn/DOT) creates base maps used for construction, acquiring right-of-way, and computation of earthwork volumes for new construction, maintenance, or safety updates to Minnesota's Trunk Highway system. The base map consists of 3D line work to represent feature and topographic data. The 3D line work is created by viewing aerial photographs in stereo and placing the line work at the correct elevation level that accurately depicts the features and ground.

#### Active Users of 3D/Stereoscopic Displays

The Mn/DOT uses stereoscopic displays to create digital terrain elevation models. To build a roadway in an economical manner, the design should match the natural ground profile. Because the contractors who build the road have costs associated with how much earth they need to excavate or build up with dirt and gravel, it is advantageous to have the cuts and fills balance each other out. The Photogrammetric Unit maps the terrain to precise dimensions in 3D space so the design team has an accurate and realistic view of the road construction site.



*The SD2020 is the centerpiece of the photogrammetric workstation*

Base map accuracy has significant impact on the cost of a project. The more closely the design of the road matches the existing conditions the more economical the roadway is to build. Smaller amounts of cuts and fills translate to less right-of-way that needs to be purchased in order for the design to transition to the pre-existing conditions. The cost of right-of-way is expensive; therefore any design that can match the ground as it is will require less right-of-way to be purchased.

The Photogrammetric Unit at Mn/DOT incorporated Summit Evolution software from DAT/EM Systems International in their photogrammetric workstations. The photogrammetry software allows aerial imagery to be viewed, analyzed and processed using a stereoscopic 3D monitor. Extracting the 3D data can not be done on a standard 2D monitor.

#### Fatigue with CRTs

The technicians have years of experience with a variety of stereoscopic solutions. The organization used CRT solutions with either CrystalEyes active goggles or polarized glasses in conjunction with a ZScreen. The technicians were frustrated with the heavy and bulky glasses of the CRT-based systems. The glasses caused eye fatigue and required frequent replacement of batteries. The glasses were expensive to replace, which happened more frequently than desired. The ZScreen did not improve the situation since flicker was still present. The ZScreen did not fit up tight against the monitor's surface, which caused annoying reflections that impeded the technicians from clearly seeing the stereo images. In addition, the display resolution of the monitors was limited, thus causing the images to appear somewhat fuzzy instead of clear and crisp.

The Mn/DOT began experiencing purchasing problems, since it was challenging to find CRT monitors with 120 Hz refresh rates so as to reduce flicker to a more tolerable level. Display failures often led to the discovery that the vendor no longer manufactured the CRT.

## The Solution

### Planar's StereoMirror™ SD2020

In their search for an affordable stereo viewing system, the Mn/DOT had several requirements: a clear crisp image, based on an up-to-date technology and a vendor that would support the product over the long-term. After an evaluation, the Planar SD2020 was determined to be the best solution. The Photogrammetry Unit was impressed with the brightness and contrast of the stereo images viewed on Planar's SD2020, especially in comparison to the CRT monitors they used in the past.



*Mn/DOT personnel appreciate the viewing comfort and image quality of the StereoMirror™*

"The clarity is better and provides an overall high quality image with good contrast" says Mike Lalla, Supervisor of the Photogrammetric Mapping Group at Mn/DOT. "All of our technicians that use the SD have given me positive feed back. The technicians say it causes less eye fatigue and allows them to see into shadows easier, thus not leaving as many holes in the terrain model."

Mn/DOT technicians were pleased that the StereoMirror™ does not require large, uncomfortable glasses. Overall the technicians are experiencing less eye fatigue, which improves their performance analyzing the models. The technicians have even stated that they can more accurately see the ground with the Planar SD2020.

There were also unexpected benefits in terms of space usage. As a semi-compact work station setup that met their standards and produces a bright, clear image, the Planar SD2020 allows them "to map into areas we may not have been able to previously."

### Reducing Frustrations from Using CRTs

The Planar stereoscopic system has helped to resolve the reflection issues and distractions associated with other stereo viewing systems. The StereoMirror monitor helped resolve desktop space issues. The flat panels are more compact than CRT monitors and allow for more room on the employees desk. The glasses associated with the Planar system are very lightweight, somewhat stylish, comfortable and do not require batteries. Stereo displays in the past required large heavy glasses that caused discomfort after a long days work.

For more information about Planar's stereoscopic display solutions, please visit [www.planar3d.com](http://www.planar3d.com).

#### Corporate Headquarters:

Planar Systems, Inc.  
1195 NW Compton Dr  
Beaverton, OR 97006-1992, USA  
Toll-Free +1.866.475.2627  
(United States & Canada)  
Phone: +1.503.748.1100  
Fax: +1.503.748.5987  
Email: [sales@planar.com](mailto:sales@planar.com)

© 2007, Planar Systems, Inc. Planar is a registered trademark of Planar Systems, Inc. All other trademarks are property of their respective owners. Technical information in this document is subject to change without notice. Please consult your account manager for up to date and/or custom configurations.