

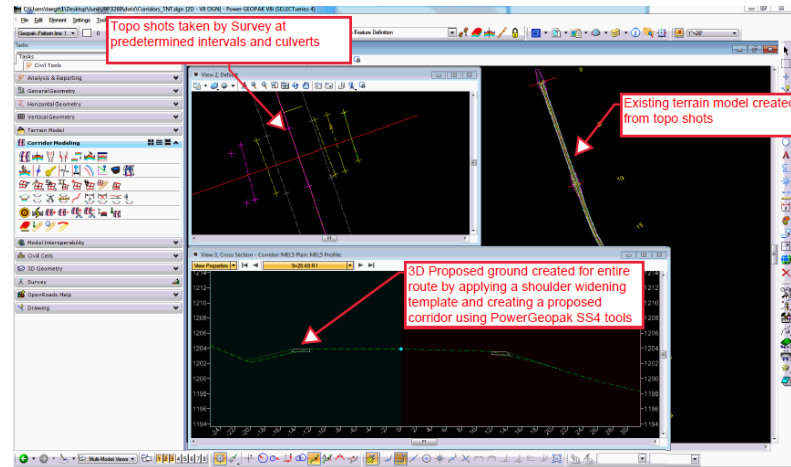


**Projects First-Round Winner**  
Innovations Challenge

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Prepared by Transportation Planning  
Missouri Department of Transportation

## Improved Shouldering Earthwork Measurement and Calculations



### Description

In past projects, the design of added shoulders and rumble striping was accomplished by the measuring of typical sections along the roadway. These were brought in the office and the existing surface was manually drawn by connecting each surveyed point. This method was time consuming in the office and did not take advantage of the tools available in PowerGeopak SS4. The new process uses current surveying methods and terrain models to allow PowerGeopak SS4 to generate cross sections and automatically calculate earthwork. A full topographic survey is completed in 20 foot sections at predetermined intervals as decided by the surveyor and designers based on field conditions. Culvert sections are areas mapped at approximately 50 feet wide to allow PowerGeopak SS4 to generate true culvert sections. Pavement is also mapped throughout the project to allow a continuous template to tie the widening to existing edge of pavement. Using PowerGeopak SS4, the survey centerline that was mapped in the field is converted into a design centerline and the existing ground is utilized as a vertical alignment. Using a widening template, a proposed ground corridor is created. Once the corridor is created, cross sections can be reviewed and plotted on the fly. Different fore slopes can easily be changed on the template, the corridor be reprocessed, and the new cross sections can be replotted very quickly.

### Benefit

The amount of preliminary engineering is reduced allowing more money to be used in other STIP projects. Trips to collect more data in the field are also reduced, saving fuel and vehicle mileage and maintenance. The amount of time required in the field increased for the initial field measurements by approximately 25 percent. The design portion was significantly decreased by using the corridor modeling tools available in PowerGeopak SS4 instead of manually drawing the sections and manually calculating the earthwork quantities. The surveyor and designer know exactly the expectation going into the project. Having a 20 feet wide mapping area decreases potential confusion of what the area actually looks like, decreasing return trips. The designer can utilize the tools available in PowerGeopak SS4 to automatically draw sections and calculate earthwork, versus having to manually draw sections and manually calculate the earthwork.

### Materials and Labor

There were no material costs or hours put towards this innovation.

**For More Information Contact:**

Bryan J. Ferguson at [bryan.ferguson@modot.mo.gov](mailto:bryan.ferguson@modot.mo.gov) or (573) 472-5298. Additional contacts: Thomas “Neal” Taegtmeyer, Jessie “Benji” Philpot, Shawndra Burkhart, Michael “Shawn” Patterson and Tristan Hollis.

Additional information, photos or videos can be seen by accessing Innovations Challenge SharePoint page at: <http://sharepoint/systemdelivery/TP/Documents/InnovationsChallenge.aspx>