Trafficability and the terrain

Machinery overturning and hitching is a well-known hazard when working on slopes. The operation of vehicles on sloping terrain requires both training and experience to ensure both operator and observer safety. Furthermore, the user must be fully informed of the capabilities and limitations of the machinery being used. A wealth of documentation on this is available such as through the Health and Safety Executive (http://www.hse.gov.uk/).

With high resolution terrain data, creating maps of the **slope** across your land can assist in highlighting areas that require increased vigilance. This can be taken further by considering **curvature** (which tells how convex or concave the land is) which can then be used to identify knickpoints that might cause hitching such as where a flat area meets the bottom of a steep slope.

Examples of a categorised Trafficability map based on slope for an area around Witney, Oxfordshire can be viewed in the UKSO map viewer with a still image below.



Figure 1 Access related trafficability based on slope calculated from Environment Agency 2 m LiDAR surface elevation data.

For the presented example, we have categorised the slope surface using arbitrary slope ranges. These values vary for all equipment and must be adjusted according to your machinery product manual.

Use of basic metrics such as those mentioned can assist in your planning when considering:

- Where to use and where to avoid using certain types of machinery
- How to improve how you plan for meeting your health and safety requirements for both yourself and those working on your land

The surfaces presented can be created for any elevation data that you have. High resolution elevation coverage data will soon be available for free for the whole of the UK.

Other information can also be used to further understand how traffic operates on certain areas of land such as accounting for the soil type and moisture content which can determine how certain areas compact relative to others and also what kind of machinery can or cannot be used e.g. when planning for direct drilling.

If you have any questions or are interested in finding out more about how you can apply these techniques to your land, get in touch at enquiries@bgs.ac.uk