

Using 3D Real Time Cad Applications in New Road Planning and Reengineering Applications

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Planning and projecting of forest roads has increased in importance in the context of eco-friendly forestry consideration developing in recent years. Together with the advancement of technology, computer software intended for road planning and design were developed. Some of these software used in road planning can be listed as Advanced Road Design, Allplan, Anadelta Tessera, AutoCAD Civil 3D, AutoRoads, Bentley InRoads, Bentley MXROAD, CAD&PILLAR, Carlson Civil, Civil Designer, Digicorp Civil Design, Diolkos, HEADS Pro, HighRoad, HY-SZDL, ISTRAM ISPOL, KeyTERRA-FIRMA, LISCAD, NetCAD, Novapoint, NovaTDN, Odos, Optimum Road Design Model, PDS, Plateia, RoadEng, SierraSoft ProSt, VESTRA Road. Software other than RoadEng were planned and developed only for the purpose of road planning (Akgul et al., 2012).

Planning and developing forest road networks are difficult and time-consuming activities. By means of the utilization of geographical information systems (GIS), alternative routes are also taken into consideration and therefore both loss of time is avoided and more reliable designs are made (Rogers, 2001; Rogers, 2005).

However, road planning stage involves a complex process. GIS data and road geometric conditions should be taken into consider in the planning stage. In this context various 2D GIS or CAD based softwares are developed for planning stage. Since the end of the 2000s, CAD-based software companies is started to develop vertical dynamic softwares like AutoCAD Civil 3D, Autodesk Revit, AutoCAD Map 3D, BIM softwares. With using vertical softwares, the projects can be made quickly depending on the purposes and it can be monitoring in planning stage in engineering practices. In this context, vertical softwares were developed to integrate of GIS softwares and CAD softwares like BIM (Building Information Modelling) (Akıncı et al, 2008; Clemen ve Gründig, 2006; Hijazi, 2009; Isıkdağ, 2008).

In the study Autodesk Infracore 360 software which is 3D real time cad application is used to planning a sample forest road to determine vertical optimization and estimating calculation earthworks cost in Belgrad forest in Istanbul.

Firstly, new road planned in study area with aerial photos on high resolution DEM (Fig 1). In the planning stage vertical and horizontal curves are edited with different options (manual and automatically). According to different road geometric conditions, corridor vertical optimization is analyzed (Fig 2). And the finally reports of Construction and earthworks cost for each station along the optimized profile were examined. Same procedure was followed for a reengineered road in Belgrad Forest.

As a result, Planning of forest road with 3D Real Time Cad Application is more effective for planning stage, determining vertical optimization and estimating calculation earthworks cost.



Figure 1. 3D Digital surface model



Figure 2. vertical and horizontal curves

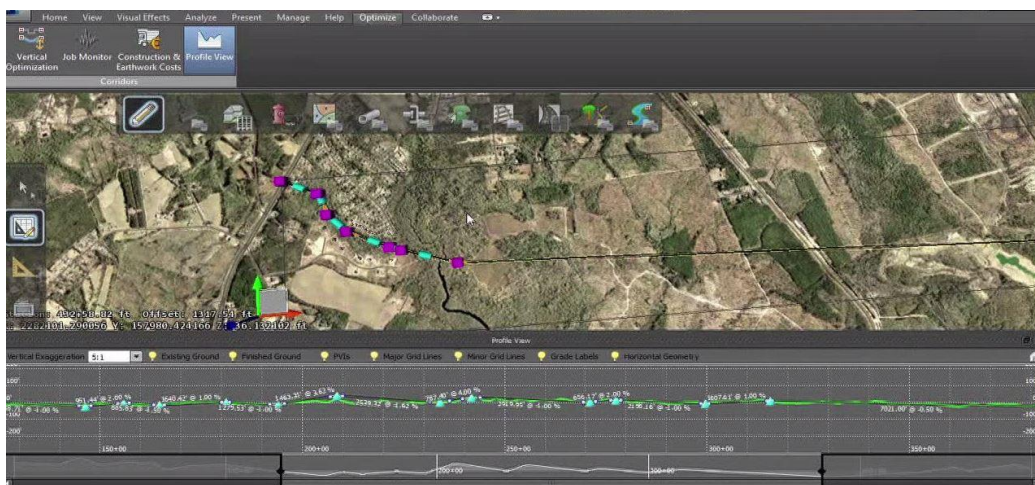


Figure 3. 3D real time profile optimization

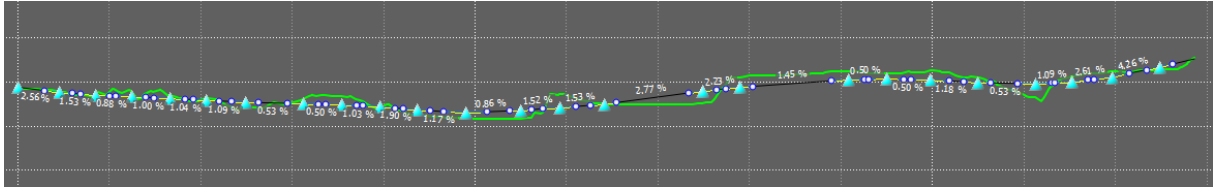


Figure 4. A profile before Profile Optimization

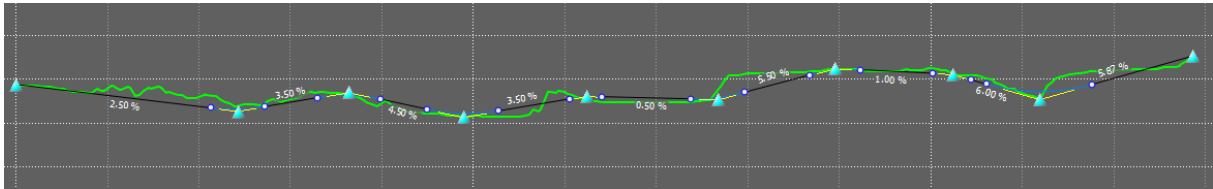


Figure 5. A profile after Profile Optimization

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