BUILDING GEOGRAPHICAL DATABASE OF FOREST ROAD NETWORK AND HAULING PLACES

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Abstract

Forest roads are not important only for forest management. They are used also for forest function utilization, for fire protect and rescue services. They should guarantee safe and continuous traffic, to make possible efficient and economical transit. The economical transit is safeguarded by determination of forest road network optimal density. In Slovak republic, parameters of forest road network have to verify to standards of "Lesná dopravná sieť" STN 73 6108. On the present, complete forest road network doesn´t exist in the Slovak republic. Technical University Forest Enterprise is a special-purpose facility at the Technical University in Zvolen. It allows for practical education of students, scientific research for the Technical University staff and for running demonstration facilities. One of the demonstration facilities are forest roads. On area of the Technical University Forest Enterprise was made exploration of forest roads. Basis of database was roads vector layer created from map. In the whole road network which was created is almost 1000 km of roads. In created road network are highways, 1. 2. and 3. rank roads and roads in cities and villages. Not all forest roads are under administration of Technical University Forest Enterprise. In details was explored almost 150 km of forest roads. In exploration of forest road network in area of the Technical University Forest Enterprise was investigated category of forest road according to STN 73 6108, roadway (bitumen, concrete, gravel, soil or other surface), damage of forest road divided to four classes, stability of slope of cutting and slope of embankment divided to four classes, state and function of dewatering if it exists, accessories of forest road and objects appertaining to forest road. To groups of accessories and objects appertaining to forest road were included traffic signs, bridges, culverts, gates and crash barriers. Position of crossroads, accessories and objects was measured by GNSS technology for accuracy of the road network. During obtaining terrain data was used GNSS receiver Trimble GeoXH. From data obtained by GNSS technology was calculated general length of roads, density of forest road network and from Digital Model Terrain was calculated slope of forest roads. The position of hauling places was measured by GNSS technology also. For hauling places was registered type of surface and their technical state. If some forest roads weren't marked in the map or the map situation

was different from the real situation, their positions were measured by GNSS technology. Geographical database was building in environment of ArcGIS Desktop 10 software. Obtained data was saved in vector layers in shapefile format files. Vector layers were saved in mdb geodatabase format. The result of investigation is forest road and hauling places geographical database, which can be complemented and changed according to requirements, as well as the forest roads and hauling places map from area of the Technical University Forest Enterprise. The created road network database is used for network analyses and also for student works. It can be applied for optimization of transport routes.