

Visualization of an avenue in the forest - Schwerin AS Ludwigslust

In Schwerin, an access road to the A14 is planned, which partly runs through existing forest. Detailed 3D visualizations were used during the planning phase to ensure the best possible preservation of structures and habitat trees for bats. The main task of PSU was the integration of submodels.

Client	Landesamt für Straßenbau und Verkehr Mecklenburg-Vorpommern
Project Execution	PSU Prof. Schaller UmweltConsult GmbH
Project Period	2023 - 2024
Services	<ul style="list-style-type: none">GIS-BIM integrationData transformation3D visualization
Study Area	Schwerin

Data basis

For the 3D visualizations, a terrain model, an orthophoto, a point cloud and the technical planning were integrated as IFC in ArcGIS Pro. As the avenue which is to be planted along the planned access road plays a major role in the planning, these trees were modeled as accurately as possible. To this end, we worked together with the company Laubwerk. They adapted their highly detailed tree models to the clearance profile of the road and optimized them for integration with ArcGIS Pro. The tree models were created in three age groups and according to the four seasons.

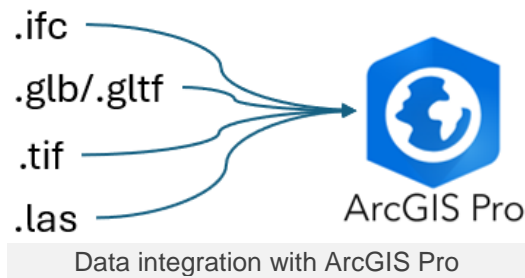


3D tree model of Laubwerk adapted to the clearance profile

Data integration

The engineering design of the road was available in IFC format. This can be integrated into ArcGIS Pro and displayed in a 3D environment.

For the display, the DTM had to be adapted and the IFC file filtered to avoid unwanted shading.



Various scenarios were visualized to support decision-making in the planning phase. These visualizations were made available to the client and the planners as image and video material.



Screenshot from the drive-through of the avenue



Tree models in fall and winter

Bat structures

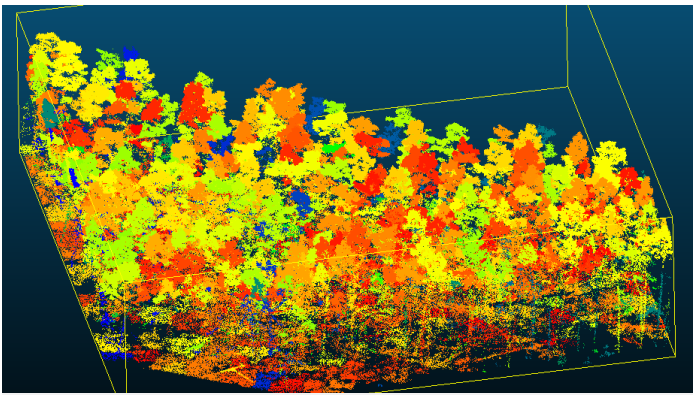
Various measures are planned to preserve guide structures for bats. Firstly, the planting distances of the avenue trees are to be reduced in certain places. When planning the avenue, attention was also paid to hop-over structure of the crowns which develop over time. Furthermore, a bat bridge is planned, which, in combination with a fence, will provide guidance structures.



Planned bat bridge

Processing of the point cloud

Different methods for segmenting the point cloud (e.g. using CloudCompare) were tested in cooperation with Fernerkundung Krauleidis in order to visualize the habitat trees to be obtained.



Segmentation of a section of the point cloud

The exported tree objects were then integrated into the visualization in ArcGIS Pro to illustrate the locations and aesthetic qualities of habitat trees worth preserving.



Single tree objects as a result of segmentation