Search and rescue in a smoke-filled underground structure

Search and rescue is a key emergency service task. It can be divided into two scenarios. First, the search of the area of interest and, second, the rescue of the designated target.

Environment:
Mainly urban structure, some vegetation, grass, sand, water, stones, rubble and debris.
The underground structure that has to be entered is approx. 250m long and 5m high.
The structure will be filled with dense smoke.
Situation:
An area of interest located in up to 10m distance has to be approached. After the area has been reached perform a search and rescue mission in a (smoke-filled) underground structure. There will be static and dynamic obstacles on the route. Dead ends, sharp turns, road blockings and narrow passages can occur.

Objective:
Approach the area of interest with highest autonomy possible. Enter underground structure and search for Objects of Potential Interest (OPI), i.e. particular markers with special characteristics as defined in the rules with highest autonomy possible. Build a geometric representation of the structure and its environment with references to the detected OPI. Whenever an OPI is found, acquire imagery and reference the position of marker in the geometric representation. Report gathered data to the control station. If possible, transmit live position and imagery to the control station.

Timing:
Duration approx. 30-45 min. The scenario ends with reaching the time limit and must include the transmission of the acquired data.