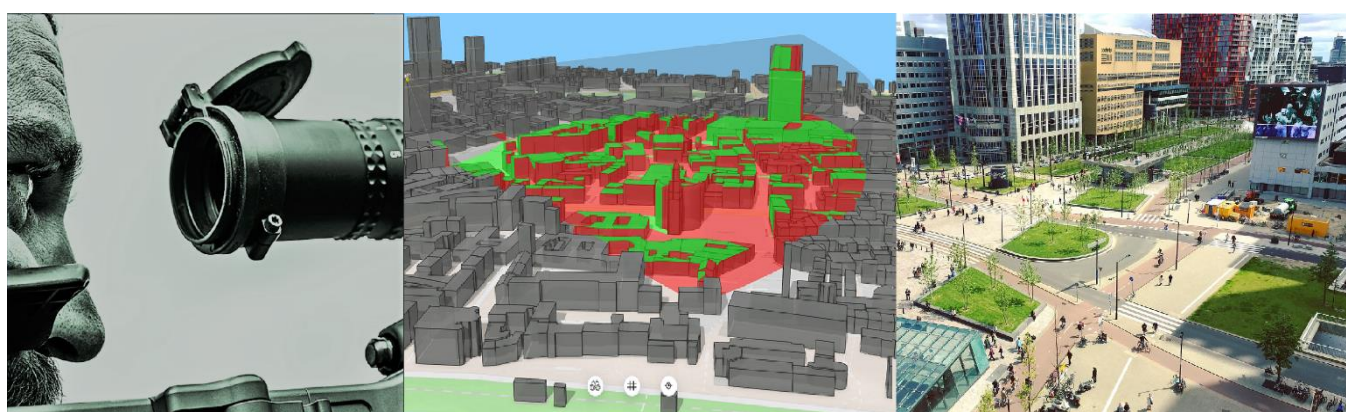




SCIENCE FOR POLICY BRIEF

Data and Tools to
Counter Terrorism

Line of Sight (LoS) Visibility Analysis against ballistic threats



HIGHLIGHTS

- Automatically carry out a visibility analysis based on lines of sight of a 3D built environment for one (or several) observer(s). Customise location scenes through the integration of the application's catalogue 3D objects, such as vehicles, vegetation, etc. (or upload own-ones)
- Best publicly available 3D data of the built environment is automatically provided, or can be uploaded by the user as geo-referenced 3D models or Building Information Modelling (BIM) data.
- Assess both outdoor and indoor locations
- 'Software-as-a-Service (SaaS) approach' provides easy access whenever needed, without worrying about compatibility, installation, maintenance or other constraints.
- Convenient and controlled access via 'EU Login'
- JRC provides 'cost-free' access to interested stakeholders on a justified 'need-to-know' basis.

COUNTERING BALLISTIC THREATS

Visibility Analysis, Line of Sight and viewsheds

Visibility analysis tools highlight locations, surfaces and structures that are visible (in green) or hidden (in red) from one (or several) user-defined observer position(s). Such positions can be used to assess capabilities (what can be seen) and vulnerabilities (what cannot be seen). In this context, a **line of sight** is an imaginary, single line between an observer and a **point of interest**, while a **viewshed** is an array of lines of sight towards an **area of interest**

How to use this to assess ballistic threats?

The application may be used to identify/mitigate active shooter threats in a built-up urban environment or inside a building. It may support event preparation planning, optimizing defender positions in order to mitigate potential risks. It is suited both for the use of events taking place in public spaces and the protection of critical infrastructure sites. It has mainly been designed for law enforcement special intervention teams and close protection services. The visibility analysis can support related decision-making.

Data quality - The application either displays best publicly available data automatically, or allows the user to upload own 3D models for analysis within the application. In computer graphics, level of detail (LOD) refers to the complexity and precision of a 3D model representation.

For **automatically displayed data** there are two data quality levels:

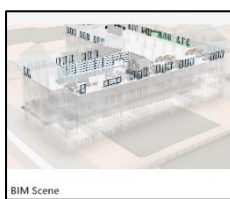


- **LOD1 (Block Model)+LOD2 (Simplified Roof and Structural Details):** From land registries and open data sources like OpenStreetMap. This basic data quality level is always available. It is usually accurate with regard to the building footprint but may have limitations with regard to the building height and roof form and details. Data quality varies according to geographical location but is constantly evolving and improving, even for this basic level.
- **LOD 3 (Detailed Architectural Model) - Immutable:** This level offers explicit architectural details like doors, windows, roof and wall details for advanced representation as a textured layer, such as georeferenced mesh files. An increasing number of cities publishes openly accessible LOD3 models that are displayed in the tool. While models may be periodically updated and published, the displayed built environment may have evolved over time.



For **user-uploaded data models** there are also two data quality levels:

- **LOD 3 (Detailed Architectural Model) - 3D Model (Photogrammetry):** While the fundamental data quality is similar to the one above, here the user uploads a 3D model that has been reconstructed from aerial photogrammetry data, for example from airplanes or drones. Therefore, it can be calibrated by the user to cover the area of interest and be more timely, for example created close to an upcoming important event to be assessed. Such models may also be provided by public sector organisations or purchased from private companies.
- **LOD 4 (Interior Model) – BIM Data:** This level adds interior elements such as rooms and internal structures, creating a digital twin of a building. It is based on Building Information Model (BIM) data (LOD400 level). This allows to do a visibility analysis within a building, particularly helpful for events or incidents in sizeable multi-storey buildings with large open areas, such as museums, government and landmark buildings or transport infrastructure, such as train stations or airport terminals.



How to get access?

Software as a Service and EU Login

Access to all applications follows a **'Software as a Service (SaaS) approach'**, making it easy and convenient for authorized users to access them whenever needed, without worrying about compatibility, installation, maintenance or other constraints.

Access is provided to interested stakeholders on a **'need-to-know basis'**. Justified access requests can be made via the website. Further instructions are available via the ['How to access the tools' page](#).

Secure and controlled access is conveniently provided via the **'EU Login'** account using mandatory Two Factor Authentication (2FA).

Viewshed analysis inside buildings based on BIM data

This example shows a viewshed analysis for a floor within a building based on BIM data.



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