ASPREX Fact Sheet

Global positioning system locator (GPS locator)

Small electronic device with software that receive signals from satellites to determine their precise location on earth. They can help a user in navigating safely in their surroundings more easily. The software or application installed in the device uses automated voice to give precise instructions and directions to users as they move around, which greatly assists them in reaching where they want to go. The GPS locator or tracker works by first determining a user's starting position and then keeps guiding the user about their route or path as they move. The software keeps updating the inbuilt maps to calculate positions more accurately. The information conveyed to the user may include the information about the nearby shops, bus stops, any road crossings, and calculates and informs the exact time required to reach the destination.

GPS locators or trackers can be available either as stand-alone devices or as part of smart phones, in both android and iOS (iPhone) applications. However, the GPS component of the software available in smartphones is considered more accurate as compared to stand-alone GPS trackers, as they continuously update the maps with the help of cell-phone towers also, as the user moves around. To provide further support to users, there are some GPS locators that have an added functionality of making an emergency call to a friend or relative in case a user loses their way. A button can be pressed by a user on their device, to connect either to an operator or any of their preferred contacts, who can then identify user's location and provide necessary assistance.

- Product Classification
  - APL (WHO Assistive Product Priority List): 15 (Global positioning system (GPS) locators)
  - ISO 9999:2022: 222912 (Localization and tracking systems)
- Possible configuration variants

  None specified.
- Possible accessories or optional components

  None specified.
- Product goals

  Activities or functions the product is mainly intended to support, according to WHO ICF Classification:
  - Moving around in different locations [d460].
- Indicated impairments

  Difficulties the product is mainly intended to address, according to the WHO ICF Classification:
  - Seeing [b210] (blindness or severe low vision).
  - Memory functions [b144].
- Contraindicated impairments

  Difficulties for which the product may be inappropriate:
  - Difficulty in hearing (the device usually provides audio directions and instructions).
  - Cognitive difficulty that may impact safe use and wayfinding.
- Indicated environments

  Specific environments in which the product should be used:
  - Outdoors (usually GPS locators only work outdoors).
- Contraindicated environments

Environments in which the product may be inappropriate:

- Crowded or noisy places (where hearing the GPS tracker instructions may be difficult).
- Far off locations which are not shown on digital maps.
- Situations obstructing the GPS signals (such as places surrounded by tall building, bad weather, or indoors spaces of buildings that are not equipped with GPS repeaters).

- Other indicated factors

Other factors or situations the product is intended to address:

- Need for navigation assistance.
- Tracking the location in case the user gets lost.

- Other contraindicated factors

Other factors or situations in which the product may be inappropriate:
None specified.

- Points to be considered in product selection
  - Despite all the navigational utility provided by GPS locators, the information provided by the devices can be mainly categorized into three main things, which include the position of a user, the changing path or route as one moves, and the estimated time of travel.
  - There are various factors that one needs to consider while using GPS locators or trackers such as the situations in which these devices might not work effectively or might fail.
  - The GPS locators must receive signals from at least 4 satellites to function properly and therefor any location where adequate signals are unable to reach the device, which could be due to high-rise buildings or bad weather, the device would not work effectively.
  - Ensure that the device is water-resistant.
- Points to be considered in product fitting
  - There are several other challenges faced in using the technology such as the locators may have limited use in the developing countries, availability of an Internet service or access to Wi-Fi signals is must, a user must have a smart phone which many users in poor or developing countries, especially in the rural settings, might not have.
  - The technology is still relatively under-utilized in developing world. A user may use an earphone but then the earphones may suppress other sounds from the surroundings, which may be important for a user's safe mobility.
  - The availability of GPS services in local languages and dialects is limited; therefore, the user needs to understand the language of instructions.
  - In order to effectively use GPS locators, a person with blindness or vision impairment also needs to be trained for mobility.
  - The user must be trained to activate the device and set-up the correct information for the destination.
  - For better assistance in orientation, the users also need to be trained to integrate the GPS information with other environmental information such as weather conditions.
- Points to be considered in product use
  - The satellite signals can be blocked by thick concrete walls or metals.
  - As GPS locators are electronic devices, they are battery powered and so the device must have fully functional and charged battery to assist the user consistently.
  - A GPS locator does not inform the user about any obstacles or barriers in their path, which means that even though devices can greatly help in navigation, they cannot, provide safety to the users.
  - The devices are battery operated and therefore a special caution is required to ensure the batteries are fully charged before going outdoors or travelling.
  - Most GPS devices are hand-held. There is a chance of them getting damaged if they fall, especially when users are travelling. Securing the device by some kind of strap (either hanging them from neck or fastening to one's wrist) can help.
- Points to be considered in product maintenance / follow-up
  - Users need to ensure the batteries are always charged properly and are not over charged.
  - A spare set of batteries must be available, or they must be replaced through vendors at the defined time.

- Examples of products available on the market
    - Live product search in the EASTIN website https://www.eastin.eu/en/searches/products/list?iso=222912

Source

This Fact Sheet was compiled in 2021 by an international team of experts, to provide the initial knowledge base for a project ("An online system to assist the selection of assistive product") supported by the World Health Organization in 2020-2021 within the GATE Initiative (Global collaboration on Assistive Product). Fact Sheets were compiled for each of the 50 types of products included in the WHO APL (Assistive Product Priority List).

The team was composed of Renzo Andrich (Italy, group leader), Natasha Layton (Australia), Stefan von Prondzinski (Italy), Jerry Weisman (USA), Silvana Contepomi (Argentina) and Hasan Minto (Pakistan).

The project led to a prototype online tool called ASPREX (ASsistive PRoduct EXplorer). At the end of the project, it was transferred to a WHO collaborating center (the Global Disability Hub in the UK), in view of possible future developments.