PASSNET / GOVERNMENT R&D

AI · IoT PERSONAL SAFETY PLATFORM

# SMART TAGBELL.

**AI·IoT-Based Portable Smart Safety Device and Integrated Monitoring & Control Platform Development & Commercialization**

Business & Technology Report · Government R&D and Commercialization Support Application

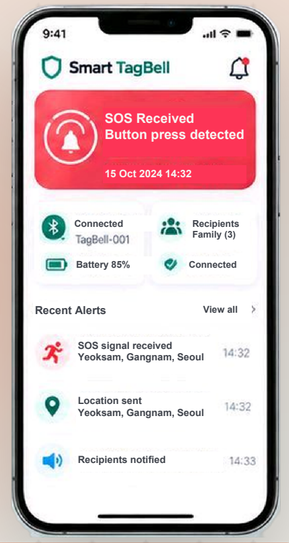
ONE CLICK · SOS

Portable Device → Smartphone → Guardians & Security Personnel → Integrated Monitoring & Control

PASSNET

# One Wearable Button Connects People to Public Safety

A compact handheld or pendant device alerts others to danger. Linked to smartphones and safety systems, this people-centered platform supports location sharing, emergency alerts and on-site response.




**01 · DEVICE**

## Smart Tagbell

Emergency input and device identification

**02 · PHONE**

## User Smartphone

Location information and external communications

**03 · PEOPLE**

## Guardians & Security Personnel

Review received information and respond

**04 · CONTROL**

## Monitoring & Control Platform

Manage incidents and response histories

**05 · AI**

## AI Analytics

Assess risks and prioritize responses

PASSNET pedestrian safety, voice guidance, sensor control, IoT communications and public safety technologies × personal safety devices → an integrated safety system

# Risks Move.
# Safety Infrastructure Stays Put.

Six limitations of systems centered on CCTV, fixed emergency buttons, emergency phones and smartphone apps

Risks arise while people are on the move

01

Distance between an incident or crime and the nearest fixed emergency button

02

Emergencies that make it difficult to take out a phone and launch an app

03

Smartphone accessibility barriers for children, older adults and foreign nationals

04

Reactive response that relies on reviewing CCTV after an incident

05

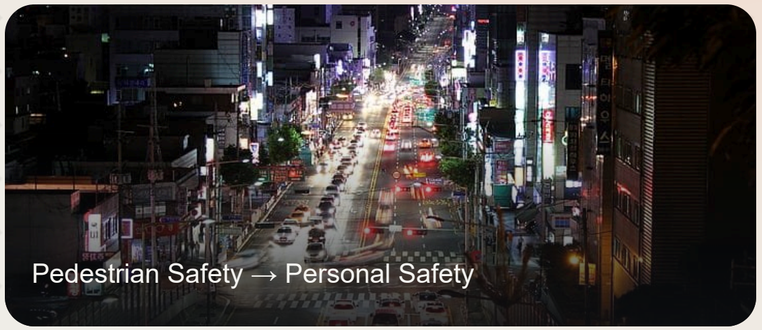
Limited links between personal safety devices and local security/control systems

06

Overseas travel, rental cars and outdoor
activities beyond domestic infrastructure

**→ A portable safety interface that communicates danger with a single physical action is needed.**

# Extending Public-Space Safety Technology to Personal Safety




Pedestrian Signal Voice Guidance Devices: Certifications and Procurement Track Record (2026 PASSNET Product Catalog)

- Excellent Procurement Product
- NEP Certification
- K Mark
- Performance Certification
- Related Patents

## EXISTING TECHNOLOGY CAPABILITIES

Pedestrian detection → voice guidance → safety equipment control → public procurement → field maintenance

## SMART TAGBELL EXPANSION

Personal risk detection / emergency calls → BLE / wireless communication → smartphone and security personnel integration → location and incident sharing → monitoring & control → AI risk assessment → response services

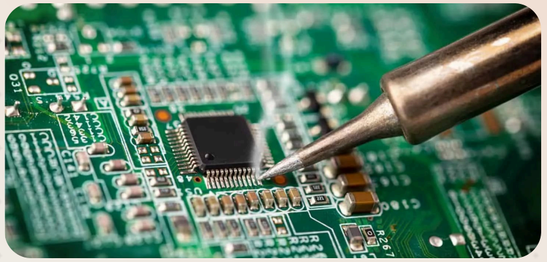
# Five Layers. One Safety Network.

A people-centered safety system with distinct roles across layers, from the device to AI

| | | |
|---|---|---|
| L1 | **Smart Tagbell** | Emergency button · BLE transmission · unique ID · low power · false activation prevention · water/dust resistance |
| L2 | **User Smartphone** | Signal reception · GPS location · guardian alerts · SMS/call integration · incident timestamps |
| L3 | **Guardians & Security** | Alert designated personnel · enable on-site response through a human response network |
| L4 | **Monitoring & Control** | User/device management · response status · security personnel assignment · battery status |
| L5 | **AI Safety Services** | Recurring risk locations · risk by time of day · behavior patterns · risk-based personnel deployment |

L5 AI-based safety services form an extension layer planned for future integration.

# Reliable Connections. Fewer False Alerts.



TECH 01

## BLE Communication with Registered Devices

Only preregistered smartphones and management terminals identify signals, reducing nearby BLE interference and distinguishing devices by user.

- Unique ID management
- Secure pairing
- Signal integrity checks
- Low-power communication
- Communication range tuning
- Multi-device management
- Reconnection / fault handling

TECH 02

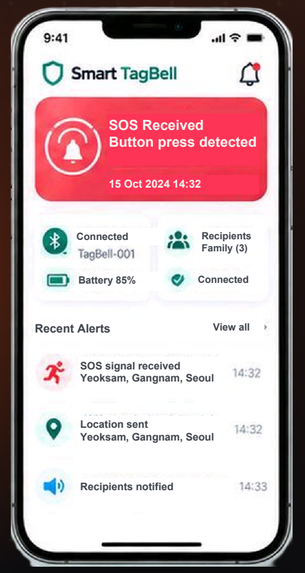
## False Activation Prevention

Minimizing false activations is a core quality requirement for emergency devices. This applies PASSNET’s field-proven safety design experience in pedestrian safety products.

- Button design optimization
- Brief contact vs. real calls
- Press-duration detection
- Repeated-input pattern checks
- Software filtering
- User cancellation
- Device fault diagnostics

# Keep the Device Light.
# Let the Smartphone Work.

Separating roles avoids fitting every costly communication function into the device. Smartphone GPS and cellular connectivity reduce device size, cost and power consumption.




STEP 01

## Emergency Call

Smart Tagbell input

Identify the registered device

DEVICE

STEP 02

## Information Sharing

Acquire smartphone location

Send emergency alerts

SMARTPHONE

STEP 03

## On-Site Response

Guardian / security review

Support administrator response

PEOPLE

STEP 04

## History Management

Record response status and results

Use records for risk analysis

CONTROL · AI

Field validation checks input recognition, signal reception, location acquisition, alert delivery and response logging separately (registered device–smartphone connection required).

# Instant Button Input × Smartphone Connectivity & Location

| Feature | Fixed Emergency Button | Smartphone Safety App | Smart Tagbell |
|---|---|---|---|
| **Portability** | None | Supported | Supported |
| **Immediate operation** | Travel to installed unit | Launch the app | Direct button press |
| **Use by children / older adults** | Limited | Limited | Easy |
| **Location integration** | Installation location | Supported | Supported |
| **Guardian integration** | Limited | Supported | Supported |
| **Security personnel integration** | Facility-specific | Limited | Can be implemented |
| **Public safety infrastructure** | Supported | Limited | Expandable |
| **Device identification** | Installed unit | User | User + device ID |
| **Service scalability** | Low | Moderate | High |

Note: General functional comparison and development direction. Actual functions will be defined according to connected systems and operating environments.

# From School Commutes to Smart Cities

B2C · 01

## Child Safety

Press the pendant device during school commutes or outdoor activities to alert guardians.

B2C · 02

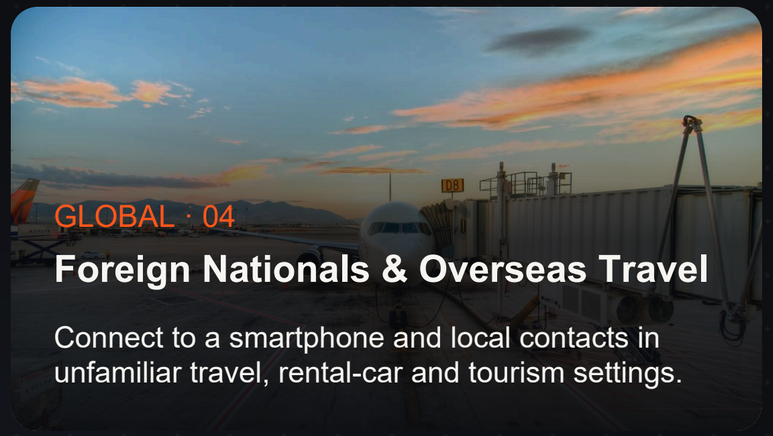
## Women & Single-Person Households

Call for help quickly when returning home, in parking areas or on walks where risks may arise.

B2C · 03

## Older Adult Safety

One button lets older adults who struggle with smartphones request help after a fall or in an emergency.



GLOBAL · 04

## Foreign Nationals & Overseas Travel

Connect to a smartphone and local contacts in unfamiliar travel, rental-car and tourism settings.

B2B · 05

## Security Industry

Connect staff and security personnel across apartments, hotels, resorts, golf courses, factories and logistics centers.

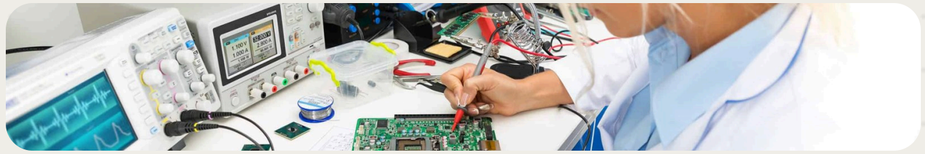
B2G · 06

## Smart Cities

Link smart poles, CCTV, emergency buttons, traffic safety facilities and urban control centers.

Field validation: button usability by user group · BLE stability at each site · smartphone location/connectivity conditions · alert-to-response coordination

# Five Stages from Prototype to Commercialization



## 01

### Prototype & Communications

Hardware design

BLE communication module

Unique ID / user registration

Low power / false activation prevention

Android / iOS apps

## 02

### Emergency Integration

Location integration

Emergency guardian contact

Security personnel calls

Multi-user/device management

Data server development

## 03

### Monitoring & Control Platform

Administrator web service

User / device management

Event / response status management

Location-based incident display

Data history management

## 04

### AI Safety Services

Incident data analysis

Risk location analysis

User pattern analysis

Response prioritization

Public safety integration API

## 05

### Validation & Commercialization

Child safety field trials

Security field trials

Facility management trials

Overseas applicability tests

Certification / production design

# Reliability Proven in Numbers

**99%+**

Emergency button recognition rate

**99%+**

Successful BLE communication rate

**99%+**

Successful emergency alert delivery

App recognition after activation
**Within seconds**

False activation rate
**Minimized / internal criteria**

Battery operation
**Long-life, low-power design**

User registration
**Multiple users and devices**

Monitoring & control system
**Real-time event management**

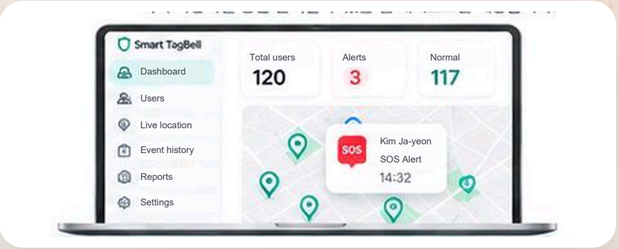
Field validation
**At least two application areas**

Intellectual property
**New patents**

Commercialization
**Production-ready prototype**

Note: Final targets will align with the funding call’s TRL and evaluation criteria and be defined as values measurable by testing institutions.

# Revenue Beyond a One-Time Sale




REVENUE A

## Device & Platform Revenue

Personal device sales · bulk institutional supply

Monitoring platform fees · API and platform services

REVENUE B · RECURRING

## Operations & Expansion Revenue

Maintenance contracts · security company services

Smart city projects · overseas partner licensing

**Domestic commercialization: prioritize B2G and B2B, then expand into the consumer market**

STAGE 1

**Safety programs for children, older adults and vulnerable groups**

STAGE 2

**Schools, apartments, resorts, industrial facilities and security firms**

STAGE 3

**Municipal smart city and urban safety projects**

STAGE 4

**Individual consumer market**

Build product reliability through public-sector field trials → expand into the private market

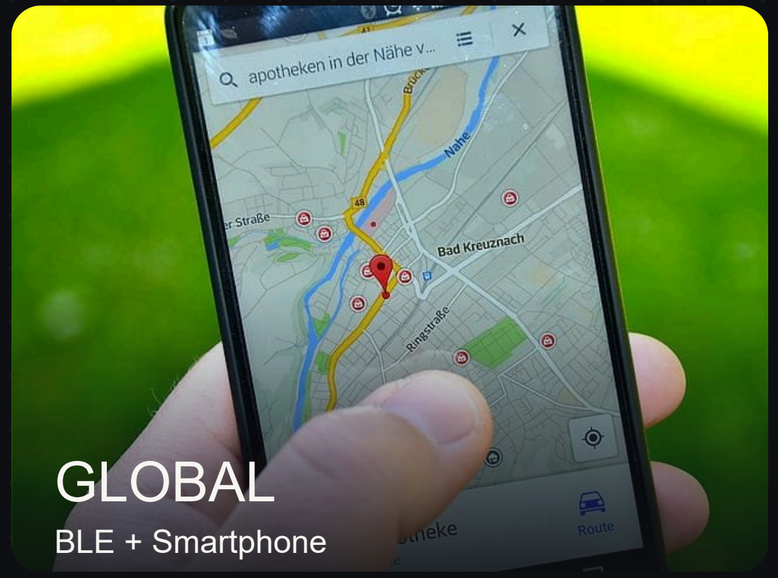
# Across Borders, the Smartphone Provides the Connection

The BLE–smartphone architecture reduces the device’s dependence on each country’s cellular network environment, supporting deployment in overseas markets.

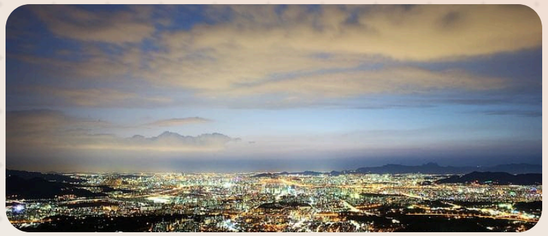
## PRIORITY MARKETS FOR ASSESSMENT

- Southeast Asian security
- Tourist safety services
- Hotels / resorts
- Large housing estates
- Factories / industrial parks
- Local security firms
- International schools
- Car rental / tourism services

Market entry: begin with local telecom operators, security firms and facility operators, then expand into regional safety platforms.



# From Manufacturer to Platform Company



SYNERGY CHAIN

Pedestrian safety → risk detection → personal emergency calls → on-site voice guidance → security / administrator response → monitoring & control → AI risk analysis

IP STRATEGY

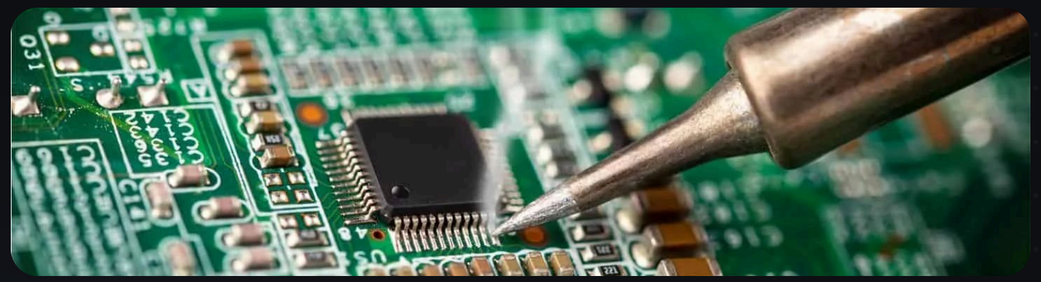
## Protect Operating Methods and Algorithms, Beyond Appearance

Combined hardware, software and platform IP protection establishes a basis for countering product imitation.

| | |
|---|---|
| P1 | Unique-ID-based portable safety device system |
| P2 | Emergency call system linked to a designated smartphone |
| P3 | Multi-party safety communication among Tagbell, smartphones and security personnel |
| P4 | Emergency call technology that prevents false activation |
| P5 | Security personnel assignment based on user location |
| P6 | AI-based risk analysis and response methods |
| P7 | Integration of public safety infrastructure and personal portable devices |

# Hardware to AI. Development Must Proceed in Parallel.

Hardware, apps, servers, monitoring, AI, field trials, security and certification must advance together. Delivering all of this quickly through an SME’s own funding is a substantial burden.



## 10 DEVELOPMENT PRIORITIES

- 01 Core hardware development
- 02 Mobile app development
- 03 Monitoring platform development
- 04 AI analytics development
- 05 Reliability testing
- 06 Security validation
- 07 Field trials
- 08 Product certification
- 09 Patent acquisition
- 10 Domestic / overseas commercialization

**Government R&D support → lower technology development risk · access to public-sector field trials → faster market entry**

# From Reactive to Proactive Response

TECHNICAL

## Technical Impacts

- Integration of personal safety devices and smartphones
- Connection of public safety facilities and personal devices
- Acquisition of AI-based risk analysis technology
- Acquisition of intelligent monitoring technology
- New patents in safety technology

SOCIAL

## Social Impacts

- Stronger child safety
- Protection for older adults and vulnerable groups
- Safety support for women and single-person households
- Faster initial response to crimes and accidents
- Greater safety for tourists and people overseas
- From CCTV-based post-incident review to proactive response

ECONOMIC

## Economic Impacts

- Creation of a new safety device market
- Expansion of public procurement markets
- New markets combining security services and technology
- Recurring SaaS monitoring service revenue
- Entry into overseas smart city and security markets
- New job creation

# From One Button to an AI Safety Network

GEN 1

**Button-Based Smart Tagbell**

GEN 2

**Smartphone & Guardian Integration**

GEN 3

**Security & Facility Management Integration**

GEN 4

**Smart City & Public Safety Platform Integration**

GEN 5

**AI Safety Network**

AI analyzes risks and supports response

Integrate pedestrian signal voice guidance devices, AI laser sensors, smart safety facilities and Smart Tagbell → a safety service platform connecting people and urban infrastructure

# Safety Should Move With People.

A next-generation AI·IoT safety platform connecting personal, facility and urban safety.

From a pedestrian safety specialist to an AI·IoT smart public safety specialist, expanding from domestic field validation into international safety markets.