# 1. Parcel Tracking Functionality

FR1.1: The system shall generate and assign a unique, alphanumeric tracking number for each parcel upon entry into the system.

FR1.2: The system shall provide a user-friendly interface for senders to track their outgoing parcels using the assigned tracking number.

FR1.3: The system shall provide a user-friendly interface for receivers to track their incoming parcels using the assigned tracking number.

FR1.4: The tracking interface shall display real-time status updates of the parcel, including but not limited to:

- Parcel registered in system

- Parcel picked up from sender

- In transit (with current location)

- Out for delivery

- Arrived at Smart Delivery Box (with box location)

- Picked up by receiver

- Delivery exceptions (e.g., failed delivery attempts, delays)

FR1.5: The system shall send customizable notifications to both sender and receiver at each major stage of the delivery process, as defined in FR1.4.

FR1.6: The tracking feature shall be accessible through both the web application and mobile application, with a consistent user experience across platforms.

FR1.7: The system shall provide an estimated delivery date and time, updated in real-time based on current status and historical data.

FR1.8: The system shall provide a visual map-based representation of the parcel's journey, when applicable.

# 2. Secure Information Transaction Processing

FR2.1: The system shall implement end-to-end encryption using industry-standard protocols (e.g., TLS 1.3) for all data transmissions between the application and the service provider.

FR2.2: The system shall require multi-factor authentication (MFA) before accessing any login into a new device.

FR2.3: The system shall use secure protocols (e.g., HTTPS) for all communications with the service provider's servers, and shall implement HTTP Strict Transport Security (HSTS).

FR2.4: The system shall implement a secure API for exchanging information with the service provider, using token-based authentication and rate limiting to prevent abuse.

FR2.5: The system shall log all transactions and maintain an immutable audit trail of information exchanges with the service provider, stored for a configurable retention period.

FR2.6: The system shall comply with relevant data protection regulations (e.g., GDPR, CCPA) when processing and storing user and parcel information, including data minimization and purpose limitation principles.

FR2.7: The system shall provide the ability to revoke access tokens in case of suspected security breaches, with an automated system to detect and respond to unusual activities.

FR2.8: The system shall implement data encryption at rest for all sensitive information stored in databases.

FR2.10: The system shall provide a user-accessible log of account activities and login attempts.

# 3. Smart Delivery Box Interaction

FR3.1: The system shall generate unique, time-limited, and encrypted access codes for delivery personnel to open specific Smart Delivery Boxes.

FR3.2: The system shall allow receivers to generate one-time, expiable access codes for collecting their parcels from Smart Delivery Boxes.

FR3.3: The system shall record each access attempt to Smart Delivery Boxes, including successful and failed attempts, with timestamps and, if applicable, user identification.

FR3.4: The system shall notify the receiver, sender and service provider immediately when a parcel is deposited in or removed from their designated Smart Delivery Box.

FR3.5: The system shall provide real-time status updates on the availability and capacity of each Smart Delivery Box.

FR3.6: The system shall allow users to remotely lock or unlock their designated Smart Delivery Box through the mobile or web application.

FR3.7: The system shall implement a fallback mechanism for accessing Smart Delivery Boxes in case of system failures or connectivity issues.

FR3.8: The system shall support integration with various Smart Delivery Box hardware from different manufacturers.

# 4. Notification System

FR4.1: The system shall send push notifications to users' mobile devices for important updates, ensuring delivery across both iOS and Android platforms.

FR4.2: The system shall allow users to customize their notification preferences, including:

- Notification channels (e.g., email, SMS, push notifications)

- Types of events to be notified about

- Frequency of notifications

- Quiet hours for notifications

FR4.3: The system shall send reminders to receivers if a parcel remains uncollected in a Smart Delivery Box for a specified period, with escalating frequency as the holding period nears its end.

FR4.4: The system shall provide real-time delivery exception notifications, including reasons for delays or failed delivery attempts.

FR4.5: The system shall support localization of notifications based on the user's preferred language and time zone.

FR4.6: The system shall provide an in-app notification center where users can view and manage all their notifications.

FR4.7: The system shall allow users to set up notification rules based on specific criteria (e.g., parcel value, sender, urgency).

FR4.8: The system shall implement a mechanism to ensure critical notifications are not missed, such as requiring user acknowledgment for important updates.