

---

**Use Case 1(a): Call the elevator to a location**

---

**Scope:** Elevator subsystem**Level:** user goal**Primary Actor:** Potential Passenger**Stakeholders and Interests:**

- Potential Passenger: wants elevator to arrive quickly and safely to their floor, wants clear indication of where the elevator is currently located and which direction it is heading.
- Maintenance: wants the maintenance switch to work as intended, wants ability to override the queue/all requests and bring the elevator to certain floor.
- Emergency Personnel: wants the alarm switch to work as intended, wants ability to override the queue/all requests and bring the elevator to certain floor.
- Building Owner: wants elevator to be in complete working order and in compliance with all current regulations (up to code).

**Preconditions:** Elevator is not in alarm or maintenance mode. Maintenance/Emergency personnel are identified and authenticated.**Success Guarantee:** Directional button is no longer lit. Door is open to reveal elevator car.**Main Success Scenario:**

1. Potential passenger arrives in front of elevator control panel. [*Alt: PP decides not to ride the elevator*]
2. Potential passenger pushes a directional button on the panel [*Alt: 2nd button is also pushed after the 1st*]
3. Directional button becomes lit.
4. Elevator car arrives at the designated floor. [*Alt: Elevator is already at the target floor*]
5. Directional button is no longer lit.
6. Door at floor opens revealing elevator car.

**Extensions:**

\*a. At any time, the alarm mode can be activated:

1. Empty the request queue.
2. Go to the nearest floor (regardless of direction it was heading).
3. Open the doors on that floor.

1a. Potential passenger decides not to ride the elevator (aka nothing happens!).

2a. A 2nd directional button is also pushed by person B:

1. Person A (who chose the 1st direction) does not board the elevator or push any floor button:
  - a. The elevator follows its next highest priority in the queue.

4a. Elevator is already at the target floor:

1. The request is removed from the elevator queue.

**Special Requirements:**

- Backup power generator/battery in case of power outages.
- Fire resistant cable cords.
- Doors may be forced open with rescue equipment.

- Roof of elevator car may be used as alternate exit.
- Alarm mode has ability to be activated from inside the elevator car.

**Open Issues:**

- What is the maximum weight allowed on the elevator car?
- Is the elevator insured? If so, how much?
- What is the contract with the maintenance? How often does s/he inspect?

---

**Use Case 1(b): Tell the elevator to drop off a passenger at a location**

---

**Scope:** Elevator subsystem**Level:** user goal**Primary Actor:** Passenger**Stakeholders and Interests:**

- Passenger: wants elevator to arrive quickly and safely to their floor, wants clear indication of where the elevator is currently located and which direction it is heading.
- Maintenance: wants the maintenance switch to work as intended, wants ability to override the queue/all requests and bring the elevator to certain floor.
- Emergency Personnel: wants the alarm switch to work as intended, wants ability to override the queue/all requests and bring the elevator to certain floor.
- Building Owner: wants elevator to be in complete working order and in compliance with all current regulations (up to code).

**Preconditions:** Passengers are already in the elevator, and elevator is not in maintenance or alarm mode**Success Guarantee:** Elevator stops at a target floor and open the door. The lit for this floor is off. The request is removed from the queue.**Main Success Scenario:**

1. Passenger has already been inside of elevator.
2. Passenger press the floor numbers [Alt: Press multiple numbers or none (2-9 loops)]
3. The button of that floor is lit.
4. The floor number is inserted into the queue and decide the priority.
5. Close the door.
6. Go to the target floor.
7. Open the door.
8. The lit of that floor number becomes off.
9. The floor number is removed from the queue.
10. Passenger exits.

**Extensions:****\*a.** At any time, the alarm mode can be activated:

1. Empty the request queue.
2. Go to the nearest floor (regardless of direction it was heading).
3. Open the doors on that floor.

2a. Passenger press multiple numbers.

1. The requests are inserted into queue and determine the priority.

2b. Passenger press none bottom after 5 seconds

1. The elevator read from queue and determine next operation

2c. The elevator is already on the target floor.

1. The request is ignored.

**Special Requirements:**

- Backup power generator/battery in case of power outages.
- Fire resistant cable cords.
- Doors may be forced open with rescue equipment.
- Roof of elevator car may be used as alternate exit.
- Alarm mode has ability to be activated from inside the elevator car.

**Open Issues:**

- What is the maximum weight allowed on the elevator car?
- Is the elevator insured? If so, how much?
- What is the contract with the maintenance? How often does s/he inspect?

---

**Use Case 1(c): “Stop” elevator at current location (via stop button)**

---

**Scope:** Elevator subsystem

**Level:** user goal

**Primary Actor:** Passenger

**Stakeholders and Interests:**

- Passenger: wants elevator to stop and keep the door open in case there are more people coming or moving an big object.

**Preconditions:** Elevator is not in alarm or maintenance mode.

**Success Guarantee:** The floor is chosen. Door is kept open to reveal elevator car.

**Main Success Scenario:**

1. Passenger reaches the elevator control panel(in the elevator). [*Alt: P decides not to stop the elevator*]
2. Passenger pushes “stop” button on the panel [*Alt: Stop button is pushed again.*]
3. Stop button becomes lit.
4. Elevator car stops at the current location.
5. All the operations halt.

**Extensions:**

- \*a. At any time, the maintenance crew can activate maintenance mode:
  1. System stops accepting new requests.
  2. Services all of the pending requests.
  3. Goes to first floor.
  4. Open the doors on first floor.

\*b. At any time, the alarm mode can be activated:

1. Empty the request queue.
2. Go to the nearest floor (regardless of direction it was heading).
3. Open the doors on that floor.

1a. Passenger decides not to stop the elevator (aka nothing happens!).

2a. Passenger hits the stop button the second time:

1. Resume to the latest request.

### **Special Requirements:**

- Backup power generator/battery in case of power outages.
- Fire resistant cable cords.
- Doors may be forced open with rescue equipment.
- Roof of elevator car may be used as alternate exit.
- Alarm mode has ability to be activated from inside the elevator car.

### **Open Issues:**

- What is the maximum weight allowed on the elevator car?
- Is the elevator insured? If so, how much?
- What is the contract with the maintenance? How often does s/he inspect?

---

## **Use Case 2: Handle Emergency Command**

---

*Main Success Scenario:* An automated actor outside the elevator (e.g. fire alarm system) sends an emergency signal to the elevator. The elevator moves to the floor nearest its current position and opens the doors. Then refuses all other actions until it is reset. After the emergency request is shut off the elevator returns to the first floor and returns to normal operations.

*Alternate Scenario:* If an actor inside the elevator presses the 'Emergency button' . The elevator moves to the floor nearest its current position and opens the doors. Then refuses all other actions until it is reset.

If the elevator is unable to move open the doors at current location and transmit emergency signal.

If the elevator can move but the doors cannot open, move to the nearest floor, hold position and transmit emergency signal. The door should be manually openable by an actor inside or outside by using force.

If the elevator can neither move nor open its doors, hold position and transmit emergency signal.

---

**Use Case 3: Handle Maintenance Request**

---

*Main Success Scenario:* A maintenance person sends a maintenance request to the elevator. The elevator stops accepting new requests and finishes all queued requests. Then moves to the first floor, holds position and opens the doors. Once the maintenance is complete the actor sends a request to the elevator to return to normal operations.

*Alternate Scenario:* If the elevator is unable to open doors, the maintenance personnel can issue a hold command to prevent the elevator from moving then access it from the shaft, and enter the elevator through the ceiling access.

If the elevator's self-monitoring software detects operational problems send a maintenance request to the elevator and finish as if a normal maintenance request was sent. Also send the necessary alert to management, etc. about the issue.

If the elevator cannot move the maintenance personnel can issue a redundant hold command and access the elevator through a door or the shaft.

If the elevator is ignoring stop commands a maintenance person can manually disable power to the elevator's winch system.