

## TESTING AND VALIDATION

### 1. System Overview

The **Metro Ticket Generating System** built on ServiceNow delivers a fully digital solution for metro ticket booking and generation. The system automates the complete lifecycle—from ticket request submission to QR-code-based ticket delivery—ensuring efficiency, accuracy, and a paperless travel experience.

### 2. Scope Definition

#### 2.1 In-Scope Capabilities

The system supports the following core capabilities:

- Digital metro ticket booking through ServiceNow Service Portal
- Automated fare calculation
- QR-code-based ticket generation
- Real-time notifications to passengers
- Secure storage of ticket and transaction data
- Reporting and analytics for metro operations

#### 2.2 Out-of-Scope Capabilities

- Direct integration with external payment gateways
- Hardware-level integration with metro entry/exit gates

(These are considered future enhancements.)

### 3. Functional Capability Breakdown

#### 3.1 Ticket Booking Interface

- Centralized **Service Catalog** item for metro ticket booking
- Accessible through ServiceNow Service Portal
- Captures passenger and travel details using structured variables

### **Captured Inputs Include:**

- Source Station
- Destination Station
- Passenger Category (Adult / Student / Senior Citizen)
- Number of Tickets
- Travel Date
- Payment Mode

### **3.2 Dynamic Form Behavior**

- User-friendly form design for smooth data entry
- Mandatory fields to ensure completeness
- UI Policies and Client Scripts to:
  - Show or hide fields dynamically
  - Validate passenger category-specific inputs
  - Prevent invalid station or ticket selections

### **3.3 Fare Computation Engine**

- Automated fare calculation based on:
  - Source and destination stations
  - Distance or zone-based pricing
  - Passenger category discounts
  - Number of tickets
- Logic implemented using **Business Rules** or **Script Includes**
- Ensures standardized and error-free fare computation

### **3.4 Digital Ticket & QR Code Generation**

- Unique ticket ID generated for every booking
- QR code created containing:

- Ticket ID
- Travel details
- Passenger information
- QR codes enable fast and contactless ticket validation
- Eliminates dependency on physical tickets

### 3.5 Workflow Automation

- End-to-end automation handled using **Flow Designer**
- Triggered on Service Catalog submission
- Automates:
  - Fare calculation
  - Ticket record creation
  - QR code generation
  - Ticket status updates
- Integrated with custom tables such as:
  - u\_metro\_ticket
  - u\_station\_master

### 3.6 Notification & Communication

- Automatic ticket delivery via:
  - Email notifications
  - ServiceNow alerts
- Notifications include:
  - Travel summary
  - Ticket details
  - QR code
- Keeps passengers informed at every stage

### **3.7 Data Management & Reporting**

- All ticket and transaction data stored in structured custom tables
- Supports reporting on:
  - Ticket volume trends
  - Peak travel periods
  - Station-wise passenger traffic
  - Revenue analysis
- Enables data-driven operational decisions

### **4. Role-Based Access Model**

The system enforces role-based access for:

- Passengers
- Station Managers
- Metro Operations Team
- IT Administrators

This ensures data security and controlled access to system features.

### **5. Execution Roadmap**

#### **Phase 1: Catalog & Access Setup**

- Create metro ticket booking catalog item
- Define travel and passenger variables
- Configure catalog visibility

#### **Phase 2: Form Design & Validation**

- Design booking forms
- Implement UI Policies and Client Scripts
- Validate input accuracy

### **Phase 3: Fare & QR Logic Implementation**

- Implement automated fare calculation
- Generate unique ticket IDs
- Integrate QR code creation

### **Phase 4: Automation & Notifications**

- Configure Flow Designer workflows
- Automate ticket lifecycle
- Enable email and ServiceNow notifications

### **Phase 5: Testing & Quality Assurance**

- Perform functional and workflow testing
- Validate fare accuracy
- Test QR code and notifications
- Conduct security and role-based access testing

### **Phase 6: Deployment & Monitoring**

- Deploy solution using update sets
- Validate production performance
- Release access to end users
- Monitor initial ticket bookings

## **6. Business Outcomes**

- Fully automated metro ticket booking process
- Reduced manual effort and operational errors
- Instant QR-code-based digital ticket delivery
- Improved operational visibility and reporting
- Eco-friendly, paperless ticketing system
- Enhanced passenger experience

## **7. Conclusion**

The Functional Scope and Execution Roadmap provides a structured and phased approach to implementing the Metro Ticket Generating System in ServiceNow. It ensures controlled development, reliable automation, and scalability while delivering a modern, efficient, and user-friendly digital ticketing solution.