## **Test Plan for Parking Management System**

## **1. Introduction**

## **1.1 Purpose**

## The purpose of this test plan is to validate the functionality, performance, and reliability of the Parking Management System as outlined in the SRS. The plan specifies tests to verify correct parking fee calculations, lost ticket handling, and payment processing across different parking categories.

## **1.2 Scope**

## **This test plan covers:**

## Functional testing for each parking option (valet, short-term, long-term, and economy).

## Non-functional testing, including performance, security, usability, and reliability.

## Validation of integration with payment systems and hardware components such as ticket printers and card readers.

## **2. Objectives and Goals**

## Ensure accurate fee calculation for each parking type.

## Validate system adherence to business rules, such as daily and weekly maximum fees.

## Confirm reliable processing for lost ticket fees.

## Verify the system’s ease of use, response times, and security standards.

## **3. Test Items**

## Valet Parking Fee Calculation

## Short-Term (Hourly) Parking Fee Calculation

## Long-Term Garage Parking Fee Calculation

## Long-Term Surface Parking Fee Calculation

## Economy Lot Parking Fee Calculation

## Lost Ticket Fee Handling

## System Performance and Reliability

## User and Hardware Interfaces

## **4. Features to be Tested**

## **4.1 Functional Testing**

## **1. Valet Parking**

## Verify the system applies the correct rate ($18 per day or $12 for five hours or less).

## Ensure the system can determine the rate automatically based on time parked.

## **2. Short-Term Parking**

## Test first-hour charge of $2 and $1 per additional half-hour.

## Confirm daily maximum of $24 is correctly applied.

## Verify that current parking fee displays correctly at any time.

## **3. Long-Term Garage Parking**

## Validate $2 hourly rate with a daily maximum of $12.

## Confirm weekly maximum of $72 with the 7th day free.

## **4. Long-Term Surface Parking**

## Verify $2 hourly rate with a daily maximum of $10.

## Confirm weekly maximum of $60 with the 7th day free.

## **5. Economy Lot Parking**

## Test $2 hourly rate and daily maximum of $9.

## Ensure weekly maximum of $54 with the 7th day free.

## **6. Lost Ticket Fee**

## Validate that the system charges a $10 lost ticket fee.

## **4.2 Non-Functional Testing**

## **1. Performance**

## Test that fee calculations and displays occur within 2 seconds.

## **2. Reliability**

## Verify system stability under expected load to ensure 99.9% uptime.

## **3. Usability**

## Check user interface for clear labels and ease of navigation.

## Confirm that attendants and customers can easily understand the displayed charges.

## **4. Security**

## Test SSL/TLS encryption for transaction security.

## Confirm that only authorized personnel can access administrative functions.

## **5. Maintainability**

## Test updating parking rates without requiring downtime.

## **5. Approach**

## **5.1 Testing Levels**

## **Unit Testing:** Verify individual modules for fee calculation accuracy.

## Integration Testing: Ensure system integration with payment processing and ticket printers.

## **System Testing: Validate** end-to-end functionality across all user classes.

## **User Acceptance Testing (UAT):** Gather feedback from parking attendants, administrators, and customers to ensure the system meets their needs.

## **5.2 Test Data and Cases**

|  |  |  |  |
| --- | --- | --- | --- |
| **Test Case ID** | **Feature** | **Input** | **Expected Result** |
| TC-1 | Valet Parking Fee | 1 day | Charge $18 |
| TC-2 | Valet Parking Fee | 4 hours | Charge $12 |
| TC-3 | Short-Term Parking | 1.5 hours | Charge $3 |
| TC-4 | Short-Term Daily Max | 12 hours | Charge $24 |
| TC-5 | Long-Term Garage Weekly | 7 days | Charge $72 (7th day free) |
| TC-6 | Lost Ticket Fee | Lost Ticket | Charge $10 |
| TC-7 | System Performance | Any parking activity | Fee calculated within 2 seconds |
| TC-8 | Security Access | Admin login attempt | Only authorized access granted |

## 

## **6. Acceptance Criteria**

## **Fee Calculation Accuracy:** All functional requirements (FR-1 to FR-16) must be met without discrepancies.

## **Performance:** System calculates and displays fees within 2 seconds.

## **Reliability:** System demonstrates stability with 99.9% uptime in testing environments.

## **Usability:** User interface is intuitive and accessible, providing clear instructions and feedback for attendants and customers.

## **Security:** System encrypts all transactions and restricts admin functions to authorized personnel only.

## **7. Test Schedule**

## **1. Unit Testing: Week 1-2**

## **2. Integration Testing: Week 3**

## **3. System Testing: Week 4-5**

## **4. User Acceptance Testing: Week 6**

## **8. Resources Required**

## **Testing Tools**: Manual and automated testing tools for functional and performance testing.

## **Test Environment:** Simulated environment with ticket printers, card readers, and secure payment processing setup.

## **Personnel**: Testers, Business Analysts, and developers for issue resolution.