# Post-Delivery Maintenance Plan

Project Name: Parking Lot Management System (PLMS)

Version: 1.0

Maintainer(s): Mason Hawkins and Elvis Ilor

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## Monitoring & Logging

* Monitoring Tools: UptimeRobot and Grafana are configured to track system availability, parking occupancy trends, and response times.
* Logging: Winston (for Node.js) logs user actions (e.g., reservations, entry/exit). Logs are archived daily.
* Alerting: Email and Slack alerts are configured for high error rates (e.g., booking failures, API timeouts).

## Bug Tracking & Patch Management

* Issue Tracking: GitHub Issues will track user bug reports and enhancements.
* Patch Strategy: Critical (system access/availability) fixed within 24 hours; non-critical bugs during weekly sprint.
* Versioning: Semantic versioning (e.g., v1.0.2) is used for update tracking.

## Security Updates

* Data Protection: All API endpoints require authentication and use HTTPS.
* Vulnerability Checks: Automated using OWASP Dependency-Check and `npm audit`.
* Session Management: JWT-based session tokens expire in 30 minutes; refresh tokens in 24 hours.
* Access Control: Admin dashboards are protected by role-based access (RBAC).

## Performance Optimization

* Database: Indexed license\_plate, spot\_id, and entry\_time columns in the PostgreSQL database.
* Caching: Frequently accessed data (e.g., available spots) cached in Redis.
* Lazy Loading: Implemented for map visuals and real-time camera feeds to improve UI speed.

## Scalability Planning

* Infrastructure: Hosted via Docker containers; Kubernetes handles horizontal scaling.
* Cloud Hosting: Deployed on AWS EC2 and RDS with autoscaling and S3 for image uploads (entry/exit snapshots).
* Load Testing: Performed biannually using Locust for real-time load simulation.

## User Support & Documentation

* Support Portal: Users submit issues or requests via the in-app help widget or [Support Email].
* User Manual: Provided at /docs/user-guide.pdf within the admin dashboard.
* FAQs & Tutorials: Hosted at [support.plms.com/faqs].

## Continuous Improvement & Feature Updates

* Feedback: Collected post-reservation and monthly via email surveys.
* Planned Features: Automatic license plate recognition (ALPR) module; Expanded analytics dashboard for lot owners.
* Release Cycle: Major updates every 6 weeks; hotfixes biweekly.

## CI/CD & Deployment Pipeline

* CI/CD Tool: GitHub Actions deploys staging and production after passing tests.
* Testing Stages: Unit → Integration → UI (Selenium).
* Backup Strategy: Daily backups of PostgreSQL and Redis; file snapshots stored on AWS Glacier.

## Maintenance Contacts & Escalation

* Dev Lead | [Mason Hawkinson] | [Mhawkinson@iu.edu] | Tier 1
* Support Manager | Elvis Ilor | [eilor@iu.edu](mailto:eilor@iu.edu), 3174950667 | Escalation Tier 2