QuickShip Logistics Non-Functional Requirements

This document outlines the non-functional requirements for the proposed QuickShip Logistics Route Optimization solution. The functional requirements outline the system's functionality (**what the system will do**), while non-functional requirements focus on its behavior, including performance, usability, security, reliability, scalability, maintainability, and compliance (**how the system should behave**).

To make sure the system meets all business expectations, I defined each requirement with:

- A well explained nonfunctional need.
- A clear measurable success criterion to elevate performance.
- Possible assumptions that must be true for the requirement to be achieved.

These requirements were shaped by the business context, user environment, and prior needs, such as stakeholders' digital literacy, performance and availability, and future growth.

Non-Functional Requirements (NFR)

Category	Requirement (What the system must ensure)
Performance	• The system shall support a minimum of 500 simultaneous users without degradation in performance. • The system shall respond to user requests within 2 seconds under normal load conditions. • The GPS-based driver location updates must be updated every 30 seconds, and system notifications must be sent to customers, drivers, and dispatchers within 5 seconds of event occurrence.

Security	• The system shall implement encryption for all sensitive data both in transit and at rest. • The system shall require multi-factor authentication for all user logins to enhance security.
Usability	• The system shall provide an intuitive user interface that requires no more than two clicks to access primary functions and will require no more than 20 minutes of training for first-time users. • The system shall include accessibility features to support users with disabilities, adhering to WCAG 2.1 standards. • The dispatch dashboard shall support a drag and drop route reassignment and real time map views.
Reliability	• The system shall ensure 99.9% uptime, excluding scheduled maintenance periods. • The system shall have a backup and recovery process to restore data within 2 hours of a failure.
Scalability	• The system shall accommodate a 25% increase in user load without requiring significant reconfiguration. • The system shall support the addition of new features with minimal disruption to existing functionalities.

Maintainability	• The system shall allow for updates and patches to be deployed without downtime. • The system shall have comprehensive documentation to facilitate maintenance and onboarding of new team members.

Technical and Regulatory Constraints

Technical Constraints	**Regulatory Constraints**
• The system shall be built on a cloud-based infrastructure to allow for scalability and remote access.	• The system shall comply with GDPR regulations regarding data protection and user privacy.
• The solution must be integrated with existing ERP systems using RESTful APIs.	• The system must adhere to industry standards for data security, including ISO/IEC 27001.

Measurable Criteria, Documenting Assumptions About System Quality

Measurable Criteria

1. **Performance**
    - **Response Time:** The system shall respond to user requests within 2 seconds for 95% of interactions under normal load.

- **Throughput:** The system shall process at least 200 transactions per minute during peak hours.

2. **Availability**
    - **Uptime Target:** The system shall achieve 99.9% uptime, equating to no more than 43.2 minutes of downtime per month.
    - Scheduled Maintenance: Maintenance windows shall not exceed 4 hours per month and will be communicated at least 48 hours in advance.
3. **Scalability**
    - **User Load Handling:** The system shall handle a minimum of 500 concurrent users without performance degradation.
    - **Feature Addition:** New features shall be deployable within 2 weeks with minimal disruption to existing functionalities.
4. **Security**
    - **Data Breach Response Time:** The system shall detect and respond to security incidents within 30 minutes of detection.
    - **User Authentication:** All users shall complete multi-factor authentication within 10 seconds.
5. **Usability**
    - **User Training Time:** New users shall require no more than 1 hour of training to perform basic tasks.
    - **User Satisfaction Rate:** The system shall achieve at least 85% satisfaction in user feedback surveys.

Assumptions About System Quality

1. **User Engagement**
    - Users will have a stable internet connection to interact with the system effectively.
2. **System Integration**
    - Existing systems and third-party tools will provide the necessary APIs for seamless integration.
3. **Data Quality**
    - Input data will be consistent and valid, minimizing errors during processing.

4. **User Proficiency**
    - Users possess basic computer skills, enabling them to navigate the system with ease.
5. **Regulatory Compliance**
    - The organization will maintain adherence to all relevant regulatory standards throughout the system's lifecycle.