

# RFP v3 - PDS Prescription Pickup Service Automation

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**Prepared for PDS Pharmacy Chain by Data Communications Lab**

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PDS Pharmacy operates a chain of outpatient retail pharmacies across the United States. We are seeking a **Physical Robot Interaction (PRI)** enabled robotic automation solution to extend both in-store pickup counter and drive-through services to **24/7 operation**, significantly reducing labor costs while maintaining high service quality and regulatory compliance.

Currently, prescription pickup services are limited to approximately 8 AM – 8 PM due to reliance on human pharmacy assistants for retrieving filled prescriptions from our existing physical bin system. This creates 12 hours of daily service downtime per location. The goal of this initiative is to eliminate these limitations by deploying collaborative robots that can safely and efficiently handle routine retrieval and delivery tasks.

We are looking for **Autonomous Mobile Robots (AMRs)** equipped with advanced collaborative arms and strong PRI capabilities. These robots must operate effectively in existing drug store environments designed for humans — not robots — and work seamlessly alongside customers and staff with minimal or no modifications to store layout or the current bin system.

This RFP invites qualified vendors to propose flexible, scalable solutions that enable robots to receive pickup requests from kiosks, retrieve prescriptions from existing bins, deliver them to the counter or drive-through window, and support patient interactions under appropriate pharmacist oversight.

## **Key Objectives:**

- Achieve true 24/7 prescription pickup capability
  - Substantially lower labor costs for routine tasks
  - Maintain full patient safety, privacy, and regulatory compliance
  - Minimize capital expenditure on store modifications
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## **Basic Robot Requirements**

Vendors must propose robotic systems that meet or exceed the following requirements. The solution should be based on collaborative, mobile robots capable of safe operation in human-

centric pharmacy environments.

## 2.1 Physical & Mobility Requirements

- **Height:** Maximum 5 feet 7 inches (170 cm) to operate comfortably in existing store aisles and counter areas. Preferred range: 5 feet to 5 feet 7 inches.
- **Weight & Stability:** Sufficient weight and design for stable maneuvering in a typical retail pharmacy environment with flat floors and standard aisles.
- **Mobility:** Wheeled autonomous mobile base with SLAM-based navigation, obstacle avoidance, and safe operation around customers and staff.
- **Battery & Uptime:** Minimum 4 hours of continuous operation. Quick battery swap system or automated charging solutions are strongly preferred to support near-24/7 availability.

## 2.2 Sensing & Interaction Capabilities (PRI Focus)

- **Vision System:** High-resolution 3D vision and barcode scanning capable of reliably locating and identifying specific prescription bags in a densely packed bin system.
- **Physical Robot Interaction (PRI):** Collaborative robotic arm(s) with force/torque sensing, compliant control, and gentle gripping technology suitable for handling pharmacy bags, boxes, and bottles without damage.
- **Audio & Communication:**
  - Clear speech output for communicating instructions to patients.
  - Two-way communication capability with human pharmacists or assistants for exception handling and coordination.

## 2.3 System Integration

- Seamless interface with existing kiosks to receive prescription retrieval requests and update delivery status in real time.
- Integration with Pharmacy Management System (PMS) for workflow coordination (details to be provided).
- Ability to support hybrid operations: working collaboratively with human staff during peak hours and autonomously during off-hours.

## 2.4 Safety & Operational Requirements

- Full compliance with collaborative robot safety standards (ISO/TS 15066 or equivalent).
- Collision detection, emergency stop, and power/force limiting features.
- Comprehensive logging and audit trail for all retrieval and patient interaction activities.
- Support for remote pharmacist oversight when required for regulatory compliance.

## Scope of Work

PDS Pharmacy is seeking a comprehensive robotic solution to automate prescription retrieval and delivery processes at our retail pharmacy locations. The selected vendor will be responsible for supplying, installing, integrating, training, and supporting a fleet of collaborative robots that enable 24/7 operation of both in-store pickup counters and drive-through windows.

### 3.1 In-Scope Activities

- Supply and deployment of Autonomous Mobile Robots (AMRs) with collaborative arms and strong Physical Robot Interaction (PRI) capabilities.
- Mapping and integration of robots into existing store layouts with **minimal or no physical modifications** to the facility or bin storage system.
- Integration with current customer kiosks and Pharmacy Management System (PMS) for seamless order flow.
- Development and implementation of workflows for:
  - Autonomous retrieval of filled prescriptions from existing bin systems.
  - Safe transport and delivery of prescriptions to pickup counters or drive-through windows.
  - Patient communication (instructions, payment support, confirmation).
  - Hybrid human-robot collaboration during staffed hours.
- Training of PDS pharmacy staff on robot operation, monitoring, and exception handling.
- Provision of remote monitoring, maintenance, and technical support services.
- Compliance with all applicable federal and state pharmacy regulations.

### 3.2 Out-of-Scope Activities

- Major structural modifications to store interiors or bin systems.
- Development of new vending-machine-style dispensers.
- Handling of controlled substances without pharmacist oversight.
- Full replacement of human pharmacy staff (robots are intended to augment, not fully replace, human roles).

### 3.3 Project Deliverables

- Complete robotic system hardware and software.
  - Site-specific layout mapping and robot training.
  - Integration and testing documentation.
  - User manuals, training materials, and standard operating procedures.
  - Ongoing support and maintenance plan.
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# Technical Specifications

Vendors must provide detailed responses on how their proposed solution meets or exceeds the following technical requirements:

## 4.1 Robot Hardware Specifications

- **Mobile Platform:** Autonomous wheeled navigation with 360° obstacle detection and dynamic path planning.
- **Robotic Arm:** 6+ degrees of freedom collaborative arm with minimum 5 kg payload capacity and reach suitable for bin access and counter handover.
- **End Effectors:** Interchangeable or multi-purpose grippers capable of handling paper/plastic prescription bags, boxes, and bottles safely.
- **Sensors:**
  - 3D depth cameras and high-resolution barcode scanners.
  - Force/torque sensors on arm joints for PRL compliance.
  - LiDAR and ultrasonic sensors for navigation and safety.

## 4.2 Performance Specifications

- Bin picking success rate: Minimum 95% on first attempt for typical prescription bags.
- Average retrieval and delivery cycle time: Under 3 minutes (from kiosk request to handover).
- Simultaneous robot operation: Support for 2–6 robots per store depending on volume.
- Uptime: 98%+ availability with quick battery swap or charging strategy.

## 4.3 Software & Intelligence

- AI-powered vision system for object detection and barcode reading in unstructured, densely packed bins.
- Natural language processing or pre-scripted audio for patient communication.
- Fleet management software with real-time monitoring dashboard.
- Secure cloud or on-premise integration layer.

## 4.4 Security & Data Protection

- Full HIPAA compliance for any patient data handling.
  - Role-based access control and encrypted communications.
  - Secure remote access for monitoring and support.
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## **Safety, Regulatory & Compliance Requirements**

- Robots must comply with ISO/TS 15066 (collaborative robot safety) and relevant ANSI/RIA standards.
  - System must support pharmacist remote oversight for verification and counseling when required.
  - Comprehensive risk assessment and safety documentation must be provided.
  - All patient-facing interactions must protect privacy and confidentiality.
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## **Implementation Timeline & Milestones (Vendor to Propose)**

- Pilot deployment in 1–2 stores within 90–120 days of contract award.
  - Successful pilot evaluation period (60–90 days).
  - National rollout schedule across remaining stores.
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## **Evaluation Criteria**

Proposals will be evaluated based on the following (weighted):

1. Technical Solution & Fit with Constraints (30%)
2. Experience in Pharmacy / Retail Automation & PRI (25%)
3. Cost & ROI (20%)
4. Implementation Timeline & Risk (15%)
5. Support, Training & Long-term Partnership (10%)