

# UPS Zebra Rugged Handheld Usability Findings

Moderated task-based usability evaluation with UPS delivery drivers and warehouse staff

|              |                                                      |           |                           |
|--------------|------------------------------------------------------|-----------|---------------------------|
| PARTICIPANTS | 7 UPS drivers and warehouse staff                    | DATE      | Q2 evaluation cycle       |
| METHOD       | Moderated task-based testing, contextual observation | SESSIONS  | 60-75 minutes each        |
| DEVICE       | Zebra rugged Android handheld                        | EVALUATOR | Trent Nguyen / THN Design |

## Executive Summary

The Zebra rugged handheld offers a larger display and physical keyboard compared to the DIAD, but these advantages do not translate into a better delivery experience. Drivers found the touch interface unreliable with gloves, the menu structure unfamiliar, and the device noticeably heavier over a full shift. The physical keyboard was rarely used for delivery tasks. Screen readability in direct sunlight was a recurring problem. Most participants defaulted to the DIAD when given a choice, citing trust in a familiar workflow over the Zebra's additional screen real estate.

Seven findings were identified across the evaluation. Four are severity 3 (major), two are severity 2 (moderate), and one is severity 1 (minor).

| Findin<br>g | Title                                               | Severity     |
|-------------|-----------------------------------------------------|--------------|
| 1           | Touch interface fails with gloves                   | 3 — Major    |
| 2           | Screen unreadable in direct sunlight                | 3 — Major    |
| 3           | Menu navigation mismatches DIAD mental model        | 3 — Major    |
| 4           | Device weight causes fatigue by midshift            | 3 — Major    |
| 5           | Physical keyboard rarely useful in delivery context | 2 — Moderate |
| 6           | Scan feedback is ambiguous under load               | 2 — Moderate |
| 7           | Battery status hidden from main workflow screens    | 1 — Minor    |

## Participant Quotes

*"With gloves on I have to tap the same spot two or three times before it registers. After a while you just start tapping harder."*

*"On sunny days I have to literally turn my back to block the sun just to read the screen."*

*"I know where everything is on the DIAD. With this one I'm always looking for the next step."*

*"By 1pm my wrist is tired. It's noticeably heavier than what I'm used to."*

*"I never touch the keyboard. Everything I need I can tap. The keyboard just makes it bigger."*

## Detailed Findings

### Finding 1: Touch interface fails with gloves

SEV 3

The Zebra touchscreen is unreliable when drivers are wearing standard delivery gloves. Participants needed multiple tap attempts on most interactive elements and frequently pressed adjacent targets.

**Evidence:** 6 of 7 participants missed targets or required repeat taps during gloved tasks. Average taps per target with gloves: 2.4. Without gloves: 1.1. Participants reported increasing pressure over time, leading to more errors, not fewer.

**Impact:** Drivers wear gloves in cold weather, rain, and when handling certain package types. The device becomes significantly slower to use in real delivery conditions, and missed taps on confirmation buttons can cause delivery records to fail silently.

**Recommendation:** Increase all tap target sizes to at minimum 48x48dp. Evaluate glove-mode touch sensitivity settings in the Android device configuration. Consider displaying a glove-mode toggle in the status bar so drivers can activate it without entering a settings menu.

## Finding 2: Screen unreadable in direct sunlight

SEV 3

Participants could not read screen content in direct outdoor sunlight without physically blocking the light with their body. This is a consistent problem during peak delivery hours.

**Evidence:** 5 of 7 participants turned their back to the sun, shielded the screen with their hand, or stepped into shade to read the screen during outdoor tasks. Two participants said they "just memorize the steps" when it gets too bright.

**Impact:** Drivers deliver packages outdoors throughout the day. A screen that requires workarounds to read in sunlight directly slows the delivery workflow and increases error risk, particularly on confirmation and exception screens.

**Recommendation:** Increase default screen brightness and ensure auto-brightness engages in outdoor conditions. Evaluate a high-contrast outdoor display mode. Consider whether a matte screen coating or anti-glare treatment is feasible for future hardware procurement.

## Finding 3: Menu navigation mismatches DIAD mental model

SEV 3

Drivers accustomed to the DIAD's linear delivery workflow struggled to locate equivalent functions on the Zebra. Menu hierarchies are deeper, and common delivery actions require more navigation steps.

**Evidence:** Task completion rate for "find and process a delivery exception" was 57% without assistance (4 of 7 participants). Average time on this task: 2m 42s on Zebra vs. 0m 58s on DIAD. Participants who had used the Zebra for longer tenures performed slightly better, confirming the issue is learnability, not discoverability.

**Impact:** Drivers working under time pressure cannot afford a steep learning curve. The gap between DIAD and Zebra navigation patterns creates retraining costs and slows the entire route.

**Recommendation:** Audit the most frequent delivery tasks and surface them at the top level of the Zebra interface. Reduce the menu depth for exception handling and signature capture. Consider a customizable quick-access toolbar for high-frequency functions.

#### Finding 4: Device weight causes fatigue by midshift

SEV 3

The Zebra is noticeably heavier than the DIAD. Participants reported wrist and forearm fatigue starting around the midpoint of their shift, with some choosing to set the device down between stops rather than carry it.

**Evidence:** 5 of 7 participants mentioned weight unprompted. 3 participants said they leave the Zebra in their vehicle more often than the DIAD because of the weight. One participant demonstrated an alternative two-hand grip developed to redistribute the load.

**Impact:** Device avoidance means drivers revert to less-efficient workflows. Leaving the device in the vehicle creates gaps in real-time delivery tracking. Persistent physical discomfort is a safety and ergonomic concern over a full career.

**Recommendation:** Evaluate lighter hardware configurations or carrying accessories (holsters, wrist straps). Review whether battery or hardware components contributing to weight can be reduced in future device refreshes. Surface this finding to the ergonomics and fleet management teams.

#### Finding 5: Physical keyboard rarely useful in delivery context

SEV 2

Despite being a distinguishing feature of the Zebra, the physical keyboard was used in fewer than 10% of observed text-entry tasks. Most drivers tapped the on-screen keyboard or avoided text entry entirely.

**Evidence:** Observed keyboard use: 3 of 7 participants touched the physical keyboard at all. Of those 3, 2 used it only once during the session. The primary text-entry scenarios (exception notes, address verification) were completed faster on the touchscreen by all participants who tried both.

**Impact:** The keyboard adds weight and form-factor bulk. If it does not provide a workflow advantage, it represents a design liability in the current delivery context.

**Recommendation:** Profile actual keyboard use in production telemetry before the next hardware cycle. If keyboard use is similarly low in field data, evaluate keyboard-free device configurations to reduce weight and improve one-hand grip balance.

#### Finding 6: Scan feedback is ambiguous under load

SEV 2

Scan confirmation feedback (sound, vibration, and screen state) was missed or misread by participants when scanning at speed, particularly in noisy environments or when carrying multiple packages.

**Evidence:** 4 of 7 participants re-scanned at least one package per session due to uncertainty about whether the first scan registered. Two participants muted the device, making the auditory feedback unavailable. Screen state changes after a successful scan were not prominent enough to confirm without a deliberate look.

**Impact:** Repeated scans slow the delivery workflow and create duplicate-scan errors in the tracking system. Drivers who mute the device lose the only high-salience feedback channel.

**Recommendation:** Make the scan confirmation screen state change larger and higher contrast. Consider a brief full-screen flash or color change on successful scan. Ensure vibration feedback persists as the default and is not inadvertently disabled by device management policies.

#### Finding 7: Battery status hidden from main workflow screens

SEV 1

Battery level is not visible from the main delivery workflow screens. Participants who noticed low battery did so only when the system alert appeared, which was too late for some to plan a charge.

**Evidence:** 3 of 7 participants asked "where does it show battery?" during the session. One participant discovered the battery was at 14% only when a low-battery alert appeared mid-task. Battery indicator is visible in the status bar, but is occluded by the delivery app during full-screen workflow steps.

**Impact:** A device that runs out of charge mid-route creates a gap in delivery tracking and forces the driver to return to the vehicle or borrow a device. Preventing this requires visible, actionable battery information.

**Recommendation:** Expose battery percentage on the main delivery workflow screen, either in the app header or as a persistent overlay. Consider a low-battery notification within the delivery app itself rather than relying on the OS-level alert.

## Recommendations Summary

R1

All tappable elements should meet 48x48dp minimum. Enable glove-mode sensitivity as a quick-access toggle.

|    |                                                                                                              |
|----|--------------------------------------------------------------------------------------------------------------|
| R2 | Increase default brightness, evaluate auto-brightness calibration, and assess anti-glare options.            |
| R3 | Surface the 5-7 most common delivery actions at the top level. Reduce depth for exception handling.          |
| R4 | Document weight-related fatigue as an ergonomic risk and include it in future hardware procurement criteria. |
| R5 | Use a prominent full-screen confirmation state change in addition to sound and vibration.                    |
| R6 | Show battery percentage in the app header or as a persistent overlay during workflow screens.                |

## Next Steps

- Share findings with hardware procurement and fleet management teams (weight, sunlight readability)
- Prioritize touch target and glove-mode improvements with the software/MDM team
- Run a follow-up session after menu navigation changes are implemented
- Pull production telemetry on keyboard use and scan re-rates to validate findings at scale
- Compare Zebra and DIAD task time data across a broader driver sample