

A photograph of a warehouse worker in a dark long-sleeved shirt and a bright orange safety vest, pushing a pallet of cardboard boxes on a forklift. The worker is in the foreground, slightly out of focus, moving towards the right. The background is filled with tall, multi-tiered industrial shelving units (pallet racks) packed with numerous pallets of cardboard boxes, some wrapped in clear plastic. The perspective is from a low angle, looking up at the racks, creating a sense of height and scale. The lighting is bright and even, typical of a large indoor industrial space. In the top right corner, the Panasonic logo is visible. A large white text overlay is positioned in the lower half of the image.

Panasonic

DIGITAL TRANSFORMATION IN THE WAREHOUSE: ADVANCED MOBILITY REPORT



INTRODUCTION

A surprising 80% of the 30 million¹ warehouse workers worldwide, in the field of transportation and logistics, are still using pen and paper in a physically-intensive environment that increasingly demands accuracy and real time feedback. With warehouse efficiency, so closely tied to customer satisfaction in areas like ecommerce, the low penetration of digital solutions—20% as recent as 2014, is surprising.

Unless an organization has a fully automated warehouse, the job is heavily labor-intensive. VDC research reveals that as long as human labor plays a dominant role in warehousing, any technology that optimizes workflows and improves accuracy will add tremendous value².

MOVING TO ADVANCED MOBILITY IN THE WAREHOUSE

In a warehouse, there are rows and racks full of pallets and boxes containing a sea of items that need to be accounted for. It's the warehouse workers who are the muscle behind the scenes. They pick, pack and ship boxes and containers. Advanced mobile solutions like touchscreen handheld computers or vehicle-mounted devices can hone accuracy and create a more efficient workflow impacting an organization's bottom line. Studies show that increasing productivity just 1% can translate to millions of dollars in profits.



"WORKERS EQUIPPED WITH MOBILE DEVICES CAN TELL CUSTOMERS WHERE THEIR MERCHANDISE IS AND WHEN IT SHOULD ARRIVE."

In an increasingly competitive market, where data is central to success, pen and paper, or even legacy technology solutions are not enough to maintain a competitive edge.

"This is what it's about," says Joseph Antley, a mobility sales manager at Panasonic working on the transportation & logistics vertical industry team. "Workers equipped with mobile devices can tell customers where their merchandise is and when it should arrive. It's about accurately servicing and billing customers. It's about loading the trucks and moving goods in the warehouse more efficiently whether by hand or a forklift."

This enormous opportunity for technology to streamline warehouse operations can ultimately simplify the jobs of pickers, packers, yard jockeys and managers and improve the customer experience. By transitioning to advanced mobile devices in the warehouse space, deploying next-generation software, and training workers, companies can set themselves up for success to reduce costs and heighten productivity.

Looking ahead, analysts say "smart warehouses" are the way of the future, where all movements inside the warehouse are tracked by sensors to increase efficiency, even the employees themselves. Yet while automation may be the future in the warehouse space, the industry standard for decades has been barcode scanning and printing box labels.

"My background is in automation in the auto industry and now it is warehousing distribution," says an analyst at Amazon, the world's largest online marketplace. "When I stepped into warehouse distribution, I felt like I stepped back 30 years in time for information flow. Reason being because things are done manually."

The auto manufacturing industry has a 100-year rich history of process automation while most warehouse operations are still largely operated by human labor. Automation is the latest buzzword in warehousing. The path to automation starts with a connected mobile workforce. With that ability comes the need for an increasingly skilled labor force, improved process and the ability to analyze operational metrics.

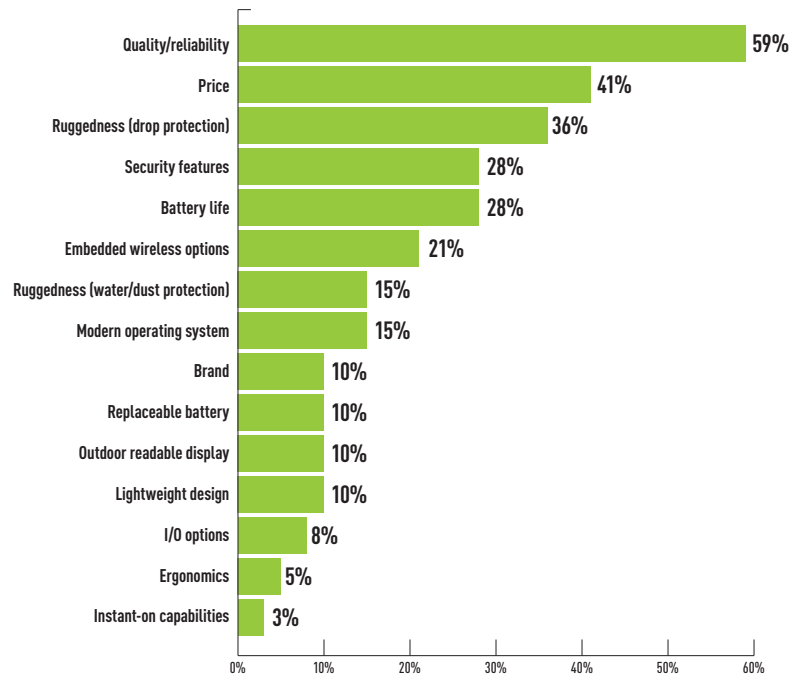
"If you have someone that's worked in a warehouse for 20 years and knows how to operate a forklift and is familiar with pen and paper systems, or old generation barcode scanners, handling a modern computing tool can come with a steep learning curve," explains the Amazon analyst. "They not only need to learn how to use the device, but need to understand the value of being a node on the network that can interpret and respond to data in real time."

For organizations aiming to automate, one challenge is training employees to utilize this higher level of automation. While it's true that increased automation can improve output and decrease cost by even more, warehouse supervisors and employees will experience the growing pains any organization with their eyes on automation must go through.

INVESTING IN MOBILITY

Investments in mobile technology in the warehouse space are expected to grow from \$1.6 billion in 2013 to \$2.2 billion in 2017, with handheld device sales expected to exceed \$650 million, or approximately 29.5% of total sales. When it comes to investing in mobile technology, warehouse leaders rank quality and reliability as the top selection criteria for mobile devices used in the warehouse. Price comes in at second. Warehouse decision-makers also place a premium on device durability given its connection to core operations and uptime.

Top Selection Criteria for Warehouse Mobile Devices



Source: VDC Research—"The Global Market for Transportation and Warehousing Solutions," 2013

The majority of mobile devices currently found in the warehouse market are rugged handhelds, forklift mounted computers, and wearable devices used for voice-directed picking. Some organizations are deploying non-rugged devices—especially tablets mounted onto forklifts, but consumer-designed devices used in the warehouse setting often experience high failure rates due to the rough warehouse environment.

Transportation and logistics companies say their investments in mobility reduces costs and improves productivity. In fact, seven in ten transportation organizations plan on increasing their annual mobile investments³. Central to these investments are the inclusion of key features in their mobile devices, including:



Battery Life and Management

Enterprise mobile users want an all-shift battery with 8–10 hours of continuous operation. Yet, 65% say their batteries do not last the full shift.



Wireless Options

In today's data intensive markets, ubiquitous connectivity is a critical component of enterprise success.



High Visibility Display

Enterprise users need superior outside viewable displays with high visibility and clarity of vision both indoors and outside in very bright or dark environments.



Security

Today only 50% are confident their organization can address potential security risks mobile devices pose.



Durability and Reliability

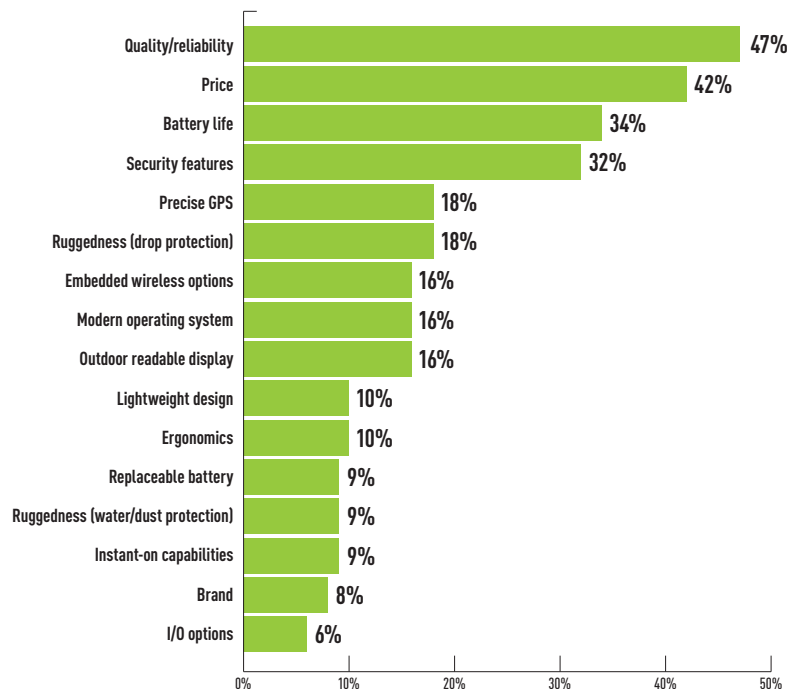
Reducing failure and managing replacements is a critical requirement. Consequences of mobile failure include disruption to workflows, lost productivity, customer relationships, and employee fatigue.



Input/Output Flexibility

Automatic data capture is critical in the transportation sector. Most companies are moving from laser scanners to camera-based barcode scanners. In addition, more sophisticated sensing solutions to address damage and fraud adds value, especially for parcel delivery services.

Mobile Device Selection Criteria



Source: VDC Research—"The Global Market for Transportation and Warehousing Solutions," 2013

WAREHOUSES USING MOBILE DEVICES

Changing worker demographics and the need for increased productivity and operational awareness are driving organizations away from legacy green screen terminal applications and legacy or proprietary-based forklift and scanning devices. Today, the shift is toward touch screen-enabled mobile devices and applications that appeal to younger, tech-savvy workers, improve productivity, are easy to manage and are not limited by design to serve a single job function.

For warehouses and distribution centers already using mobility solutions, a combination of rugged tablets and touchscreen, mobile handheld devices are desirable for many jobs. In this highly mobile environment, where real time data is increasingly important, the ability to access, evaluate and update information on the fly is a real advantage.

“Warehouse managers used to run out on the floor with pen and paper, but that’s not the case anymore. Today they grab their tablets, launch an application and access the data on demand,” explains Jim Dempsey, business development manager for Panasonic’s mobility team.



“WE NEEDED A SOLUTION THAT WOULD WORK LONG TERM, AND WE DIDN’T WANT TO CONSTANTLY REPAIR DEVICES OR DEAL WITH BATTERY LIFE ISSUES. PANASONIC TOUGH PAD COMPUTERS STOOD UP IN THE FIELD.”

HANDHELDS AND TABLETS ON THE RISE

The rugged handheld market for warehouses has matured considerably with demand for solutions outpacing supply. Currently, the rugged handheld devices used in warehouses are a brick-styled form factor with a full keyboard and gun grip, but modern handheld devices, using a more robust Windows or Android solution are gradually replacing these legacy solutions.

In Sterling Heights, Michigan, ATCO Industries has grown their business 150% helped largely by migrating to an enterprise mobile tablet-based system. ATCO, which operates nine warehouse facilities in the United States and Mexico, verifies car parts and quality for Detroit automakers, GM and FCA Chrysler and has experienced the pitfalls of using consumer devices with high failure rates due to “death by dropping” and poor battery performance.

“We needed a solution that would work long term, and we didn’t want to constantly repair devices or deal with battery life issues,” explains Falco Schiavi, a software developer at ATCO Industries. “Panasonic Toughpad computers stood up in the field. Even on our three-shift operations. We swapped batteries in between shifts and the device rolls on.”

According to Greg Berger, one of Panasonic’s mobility experts consulting with ATCO, “Toughpad tablets changed the game for ATCO by scanning parts, breaking down containers, labeling containers, and scanning in quantities. Inside each container, there are 1000 pieces of a certain part that must be tagged for accounting in order to go into production cycle. Having the right technology to streamline this critical work is essential.” ATCO is slated to deploy a large number of additional units to its workers.

EVOLVING FORKLIFT SOLUTIONS

In North America, forklift-mounted terminals are slowly transitioning to more flexible, open, touchscreen, tablet-based solutions, versus the keyboard-based, and often closed systems of the past⁴. These systems are much more economical, easier to manage and to develop or purchase software for the needed applications. An increasing number of rugged tablet options and improved price points are helping to drive adoption.

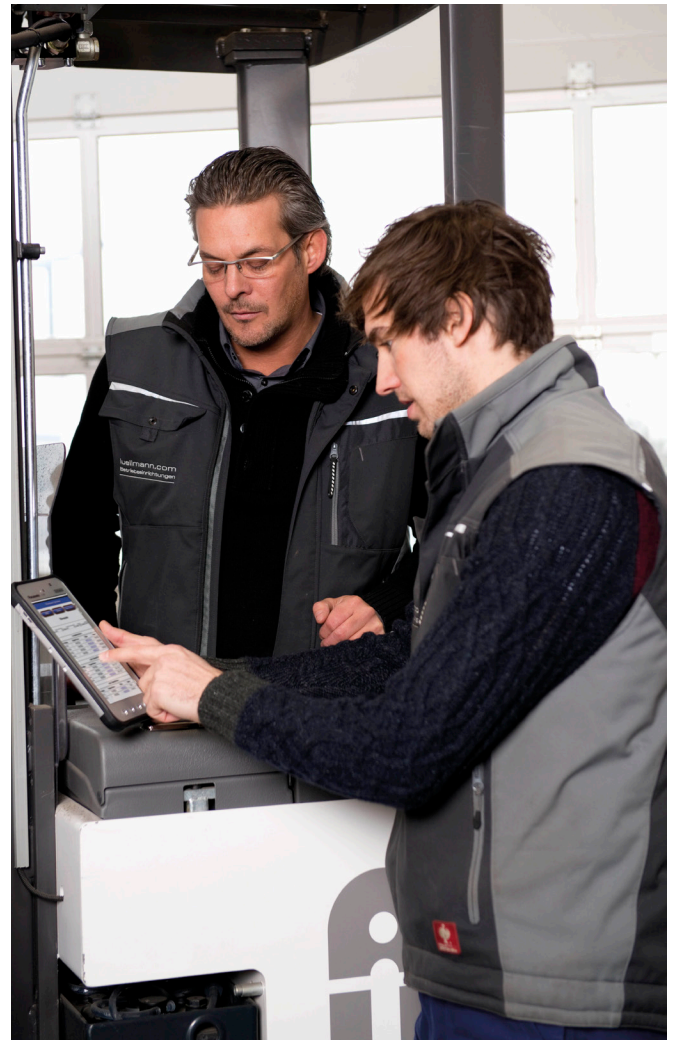
“The forklift is one of the most rugged environments around. The constant starts, stops and jerking can take a serious toll on mobile technology. You need a device designed for the environment and a mounting solution that secures it while still making it accessible,” explains Sonia Arnold, a senior solutions program developer who works in Professional Services.

In Belleville, Michigan, Dustin Braddock is bringing technology to the plant floor of Wellington Industries, a maker of car parts for the Big Three automakers.

“The old way was to have a worker come with a barcode scanner or pen and paper to support the operator on the forklift. The way we’re doing it today is by using Toughpad FZ-G1 tablets mounted on forklifts. A docking station secures the tablet and drivers can swivel and move it,” explains Braddock, a network administrator at Wellington Industries.

Braddock says if there’s an issue, the web app will tell forklift drivers where to place containers. “Some older forklift solutions were keyboard-driven, but there just isn’t enough room in such a small environment. What we have now is a solution driven by large, customizable buttons and a touch screen. It’s very easy to operate.”

“Guys on the forklift are most productive if you keep them on the forklift because they’re doing their job. Too often they have to get off and scan a pallet or remove plastic in order to get info they need. In many cases, we see people manually type in alpha numeric codes up to 20 digits in length. You can only imagine how many errors are caused in a day because of forklift drivers trying to type,” says Dempsey.



SOLUTIONS, NOT DEVICES

This growing reliance on technology solutions is placing a tax on often shrinking IT departments. Companies across the transportation and logistics markets, including warehouse and distribution centers, are turning towards vendors that can help alleviate this challenge. Today, the most common services leveraged are break/fix support and hot swap programs—next day device replacement of a unit, imaged with the company's software—but as the complexity of operations grow, service needs are expanding.

Most organizations' IT departments are not equipped to handle a large-scale deployment of mobile devices nor have the expertise and time to piece together parts from many vendors. As a result, customers are looking for partners that offer a 360 degree mobility solution that includes imaging, deploying, installation—including mounting on vehicles like trucks and forklifts—training and relationships with other vendors (peripheral manufacturers, wireless partners, etc.). Other services that are growing in demand include consultations on physical and digital system design, software recommendations, voice system solutions, robotics and most importantly, legacy system integration or migration.

Not surprisingly, interest in solutions relating to mobile technology is on the rise, with services sales in the warehouse market expected to rise to \$400 million in 2017, from \$280 million in 2013, according to a study by research firm VDC.

The ability to purchase a solution versus just a device greatly reduces the complexity the IT staff faces, allowing them to keep their focus on strategically supporting their business through technology and not by loading software, deploying devices and dealing with repairs.

Warehouse and distribution centers have a number of workers that can benefit from the use of mobile technology. Understanding their work environment and demands is central to selecting the right solution that includes the device, the needed peripherals such as a mounting solution or carrying case, application and security software and connectivity considerations.

"Companies come to us and say, 'We've got this software and we know we want to run it on a 7-inch tablet that can be used with gloves and a barcode scanner and connects to our corporate Wi-Fi. It also needs to connect to a mobile printer via Bluetooth, have full-shift battery life and take the wear and tear of our work environment. Oh, and we need help deploying the device, integrating security features and training our team,'" says Arnold. "They need a partner that has the capability to help them with all the aspects of deploying and managing a solution, but also knows their market. Market expertise is probably the greatest benefit."



PANASONIC

For over 20 years, Panasonic has been engineering mobile devices for unforgiving environments where failure has real consequences. Thousands of organizations around the world rely on Panasonic Toughbook and Toughpad devices every day. Leading the industry in product success rates, we bring the market expertise, purpose-built devices and experience that help customers reach their business goals. Our reputation and service have earned us the distinction of being the longest-running rugged computer supplier for the U.S. government, law enforcement, and public safety agencies.

But even with the toughest tools, work life can be a bit unpredictable. Make sure your workers can always depend on their Toughbook and Toughpad devices by augmenting them with a full set of support services. Panasonic's ProServices team offers planning, deployment, management, warranty, security, repair, replacement and end-of-life/recycling services that support your IT and field staff. Panasonic ProServices help companies:

- Free up IT staff and expedite deployment. Let Panasonic handle computer deployment and repairs from top to bottom for stress-free device delivery and support.
- Reduce ownership costs. Our low product-failure rate supported by Panasonic ProServices means a three-year warranty with on-site tech support and a hot swap program to cut down lost time.
- Keep mobile workers productive. Boost mobile worker productivity by having systems configured and deployed by Panasonic. And if the need ever arises, we offer prompt repairs.

TYPICAL WAREHOUSE WORK APPLICATIONS



WAREHOUSE MANAGER

Overview: Warehouse managers are responsible for the efficient operation of all warehouse activities. This can include scheduling the workforce, maintaining deadlines, assessing issues, managing inventory, etc. Warehouse managers receive orders from warehouse management and ERP systems and assign work. They're balancing labor needs by reading orders and selecting how many employees are necessary to get the work done. Warehouse managers are tasked with managing many moving parts, making business decisions in real time.

Assessment of the worker's environment: Managers split their time between the immobile reality of a typical office setting and traveling the entirety of the warehouse. Their devices transition from stationary units in temperature-controlled environments to mobile solutions that could be exposed to a wide range of operating conditions, including drops, direct sunlight, extreme temperatures and inclement weather.

Insight into the mobile computing requirements of the worker: These workers are using a mix of full office applications typically run on desktop or laptop computers, so the ability to dock a solution to a monitor, keyboard and mouse is critical. At the same time, while warehouse managers are away from their desk, they need mobile solutions offering outstanding connectivity and the ability to run touchscreen, tablet-style applications, doing data input and accessing data on-the-go easily.

Types of solutions a partner should provide to ease deployment: To ease deployment of a mobile warehouse manager solution, look for vendors that can provide device imaging, security solutions (physical, access, data and connectivity), device distribution, training as well as onsite and remote support services.

Suggested device considerations: A touchscreen tablet running a full Windows OS, powered by the latest generation Intel® processor will provide the right combination of performance and flexibility for warehouse managers. Look for tablets that have full-featured docking solutions that offer easy connection to external devices like a display, keyboard, mouse and printer, as well as I/O options such as USB and HDMI and connectivity to the network via Ethernet or wirelessly. A docking station that allows for quick removal of the device for ease of mobility is beneficial, but one that also allows the tablet to be locked in place for enhanced security is worth considering.

Suggested device types: The 10.1" Toughpad FZ-G1 incorporates the latest, fifth-generation Intel® Core™ i5 vPro™, runs a full Windows OS and is engineered to withstand the hard knocks, drops and spills of real life in the warehouse and distribution center environments. Alternate solutions include the semi-rugged 12.5" Toughpad FZ-Q1, the 7" Toughpad FZ-M1 or a hybrid laptop solution such as the Toughbook CF-20.



PICKER

Overview: Pickers are hourly warehouse workers on foot or on a forklift in facilities that may run up to three shifts 24 hours a day. They are responsible for navigating aisles to pick orders by SKU numbers. Using a handheld device, pickers build an order and then take to the packing area for processing, weighing and shipping. There are two categories of Pickers. The first works on foot and typically carries a handheld computer. This type of Picker tends to pull small quantities of various SKUs to be packaged together. The second type of Picker works on a forklift and tends to pull large quantities of product at once (e.g., taking a full pallet of parts versus an individual part). This type of Picker tends to use a forklift mounted computer with an attached or wireless scanning device.

Assessment of the worker's environment: Warehouse environments vary widely, ranging from dirty to clean, from dry to humid and from hot to blast-freezer cold. These workers are highly mobile and likely to expose their devices to a wide range of operating conditions, including drops, direct sunlight, extreme temperatures and inclement weather.

Insight into the mobile computing requirements of the worker: Pickers only need the software applications required to do their jobs, so huge hard drives and high-end processors are not as critical, although these options do enable future growth as operational requirements change.

Types of solutions a partner should provide to ease deployment: To ease deployment of a picker solution, look for vendors that can provide vehicle mounting services, device imaging, security solutions (physical, access, data and connectivity), distribution, training as well as onsite and remote support services.

Suggested device considerations: Walking Pickers need small, light, handheld devices that help to facilitate mobility, while forklift Pickers can leverage larger solutions that are mounted to their vehicles. A larger screen, 10" is ideal, is better for a forklift worker, because they have less control over how close the device is while being viewed. Forklift solutions should offer either wired or wireless connectivity for mobile scanners. Also, because Pickers are often hourly workers, they may not be as invested in the care of their mobile device as their salaried counterparts, making a durable solution advantageous.

Suggested device types: For the forklift Picker, the 10.1" Toughpad FZ-G1 incorporates the latest, fifth-generation Intel® Core™ i5 vPro™, runs a full Windows OS, offers various I/O options and is engineered to withstand the hard knocks, drops and spills of life in warehouse and distribution center environments.

For the Picker on foot, we recommend handheld such as the extremely rugged, 5-inch Toughpad FZ-E1 (Windows) or FZ-X1 (Android) devices or the 4.7-inch Toughpad FZ-F1 (Windows) or FZ-N1 (Android) with ergonomically designed barcode scanner. For walking Pickers that need a slightly larger device, the 7-inch Toughpad FZ-M1 (Windows) or FZ-B1 (Android) with a built in, optional barcode scanner is an excellent choice.



YARD JOCKEY

Overview: Yard jockeys are responsible for the movement and placements of trailers at warehouses, distribution centers and on cross-docks. Whether goods are inbound or outbound, the efficient movement of trailers, and the merchandise they contain, is essential to business performance. These workers rely on a Yard Management System (YMS) to receive and manage the day's orders.

Assessment of the worker's environment: Yard jockeys drive mini tractors outdoors in varying weather conditions including extreme heat, cold, rain and snow. As outdoor workers, bright sunlight is an environmental condition to consider.

Insight into the mobile computing requirements of the worker: Due to their vast work areas, mobile computers with excellent wireless connectivity are important, as well as devices with daylight viewable screens and wide operating temperature ratings.

Suggest the types of solutions a partner should provide to ease deployment: To ease deployment of a yard jockey solution, look for vendors that can provide vehicle mounting services, device imaging, security solutions (physical, access, data and connectivity), distribution, training as well as onsite and remote support services.

Suggested device considerations: Traditionally, yard jockeys have used heavy computer systems mounted into their tractors or handheld devices running limited operating systems like Windows Mobile or Windows CE. Today, yard jockey technology is leaning towards tablets that can easily be moved from tractor to tractor and offer more robust operating systems that can be integrated with the YMS they use. Because yard jockey devices tend to be vehicle mounted a 10-inch daylight viewable touch screen tablet is ideal, but in some cases a 7-inch tablet might work.

Suggested device types: The 10.1 inch Toughpad FZ-G1 combines the durability required for yard jockey environments, a daylight viewable screen and exceptional wireless connectivity with the latest, fifth-generation Intel® Core™ i5 vPro™ and a full Windows OS, making it a strong candidate for the job. The 7-inch Toughpad FZ-M1 (Windows) or FZ-B1 (Android) offers similar functionality for situations where space for a mobile computer is limited.

Panasonic recommends Windows.

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OR TOUGHPAD TABLETS:**

1.800.662.3537

us.panasonic.com/toughbook

us.panasonic.com/toughpad

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