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FEDERAL NEWS NETWORK

EXPERT EDITION

The modernized warehouse

Insights from

- Customs and Border Protection
- Defense Logistics Agency
- Government Publishing Office
- NASA
- National Oceanic and Atmospheric Administration
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Speed and accuracy matter in inventory management

Just getting things moved faster into and out of a warehouse is not the point. It's equally important that the *right* items makes it to or from their destinations.

Getting it right is a chief reason that agencies across the government are adopting technologies that can help small teams improve logistics and inventory management. Think barcodes, radio frequency identification, voice-activated systems and even robotic automation in federal warehouses, paired with networked systems that ensure users from the warehouse floor to senior management offices have visibility end to end from a single screen.

Just such an effort is well underway at the Defense Logistics Agency, which has been deploying an enterprise warehouse management system. "It really is a state of the art system designed in a modular sort of way that brings the focus for us — brings the goods to person — to eliminate a lot of the inaccuracies in visibility that we had in the past," points out Perry Knight, deputy commander of distribution.

In the pages ahead, we share details about not just the work on inventory and logistics revamps at DLA, but also at five other agencies: Customs and Border Protection, the Government Publishing Office, NASA, the National Oceanic and Atmospheric Administration and Naval Supply Systems Command.

We hope the insights and lessons learned shared by the experts on the front lines in these agencies can help your own similar efforts at moving to modernized warehouses.

Reach out with your own success stories. We'd love to hear them.

Send me a note at vroberts@federalnewsnetwork.com.

Vanessa Roberts
Editor, Custom Content
Federal News Network

CBP explores cloud, RFID, QR codes to modernize seized goods inventory

BY DAISY THORTON

In 2023, the Customs and Border Protection's Office of Field Operations seized [549,000 pounds of illicit drugs](#), [3,110 guns](#) and [501,368 rounds of ammunition](#). And that's not even getting into the live animals, meats, agricultural products, jewelry, counterfeit goods and even vehicles, all of which CBP Director of Fines, Penalties and Forfeitures Lisa Santana Fox refers to as violative materials.

The Homeland Security Department agency must log, weigh or otherwise measure and enter these items into a variety of systems to track them, Fox explained.

That's where CBP sees an opportunity for modernization. By integrating those systems, automating the entry of some of the data and introducing newer digital tools for inventory tracking, it can make the agency's systems more accurate and ease some of the burden on frontline employees.

"At least in the cargo arena where a manifest was transmitted to us, it goes through some systems. And then if they have to make entry on the goods, it goes through another system. And then if we interdict it and seize it, it's another system," Fox said. "So tying those systems together, so that the frontline officers — the seized property specialists … they're not keying in information. It comes in, and we just push it from one system to the next. That cuts down on the opportunity for error."

CPB looks to cloud to track seized goods

Fox said this would most likely be accomplished through a cloud-based platform, enabling smoother integration of the systems and data.

CPB also wants to do the same with its scales. When CBP interdicts narcotics, it must weigh what's been seized immediately, then again when the narcotics go into the vault — and when they come out of the vault too — to ensure none disappears during the process. And each of those weights has to be manually entered now. But digital scales could record weight automatically, reducing the potential for error, Fox said.

Likewise, all of the seized inventory has to be managed while it's in CBP custody. Violative materials like agricultural products are destroyed immediately, to keep them from contaminating the environment.

Other goods are held through to other final dispositions. Sometimes they're returned to the owners, other times they're destroyed, and sometimes they're held by CBP or transferred to another relevant agency to hold as evidence for legal proceedings.

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Lisa Santana Fox
Director of Fines,
Penalties and Forfeitures, CBP

Taking advantage of RFID, QR codes to track seized goods

Currently, CBP tracks all of that by seizure number across its various systems, a process that Fox called labor intensive. That's why it's currently piloting the use of radio frequency identification (RFID) tags for its warehouses to speed up that process and reduce the workload. The agency is also experimenting with QR codes as an alternative to manually entering data.

But even those methods have potential complications because of CBP's unique mission, Fox said. For example, most violative materials are kept in vaults with walls "at least 2-feet thick," she said. That makes it difficult to get Wi-Fi into locations even for the current tracking system that uses tablets to track the case numbers.

"We've been seizing goods for hundreds of years, just getting into the 21st century. So right now we're kind of limited to the vault operation and being able to track and streamline our inventories, which will ultimately save us time," Fox said on the *Federal Drive with Tom Temin*. "But who knows what they're going to invent next year? So we're constantly looking for opportunities to try new things, so that we

have the best equipment, the best technology for our team out in the field."

All of this is in service of CBP's goal of getting better data analytics intelligence around its inventory of seized goods. Not only will that enable better tracking, but it could also potentially reveal insights that lead from one smaller, seemingly isolated incident to a much larger operation.

"The data that's captured in the systems of record goes into platforms, data warehouses, where it can be analyzed, manipulated. We feed that intelligence back into our targeting so that we're better targeting on the front end to interdict better across the enterprise," Fox said. "And then reporting — we're reporting to Congress. We report on CBP.gov. We're constantly reporting our statistics and the efforts that we have undertaken to the public, so they know what we're out there doing."

> We're constantly looking for opportunities to try new things, so that we have the best equipment, the best technology for our team out in the field.
>
> — *CBP's Lisa Santana Fox*

Listen to the full discussion between Federal Drive Host Tom Temin and CBP's Lisa Santana Fox on modernizing tracking of seized items

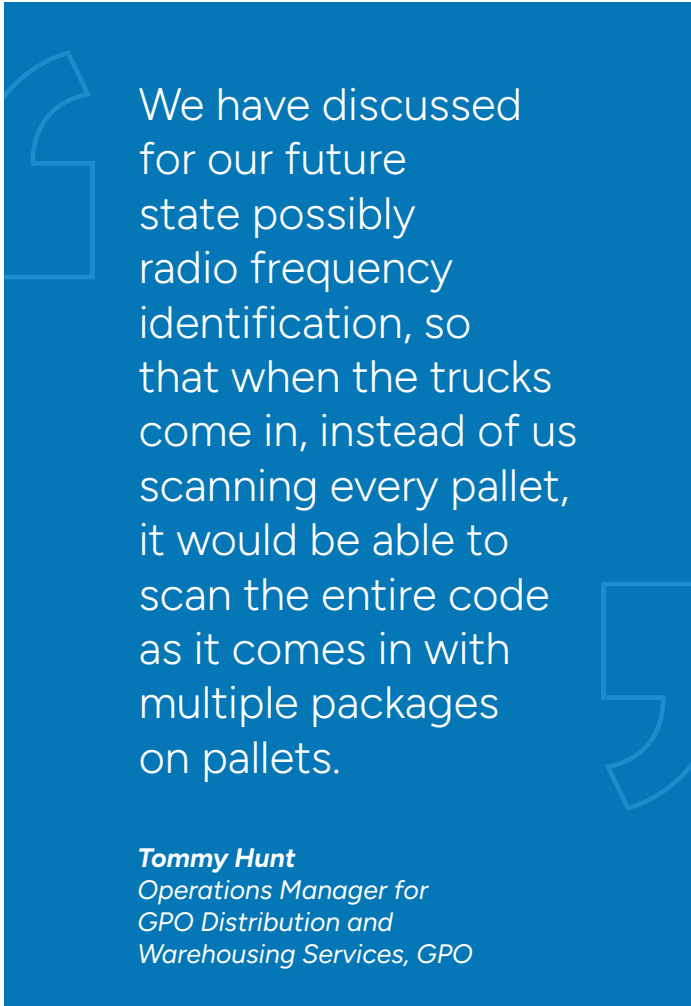# GPO distribution leverages tech to do more with less

BY DAISY THORNTON

With 68 federal customers, 130,000 square feet of climate-controlled warehousing space across two distribution centers, and more than 2.1 billion publications distributed since 1971, the Government Publishing Office has a lot of inventory to manage. Currently, that process is manual, but **Listen to the full discussion between Federal Drive Host Tom Temin and** Tommy Hunt, operations manager for GPO distribution and warehousing services, said GPO aims to change that in the future.

"We've come a long way. Obviously, we're doing more with less, just like everyone else is," Hunt said on **The modernized warehouse**. "We have discussed for our future state possibly radio frequency identification, so that when the trucks come in, instead of us scanning every pallet, it would be able to scan the entire code as it comes in with multiple packages on pallets. That has been talked about."

That would be an improvement over the current system, where employees manually scan barcodes that refer back to individual agencies. That lets GPO warehouse employees know exactly where items are when customers order them and how many have been ordered. And that's an improvement over the entirely manual process in place during the 1970s that required 176 employees at the Pueblo, Colorado, distribution center. Now, 27 employees can keep up with the center's workload.

But scanning packages isn't the only place RFID would improve the workflow. GPO uses a light

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>
> **Tommy Hunt**
> *Operations Manager for GPO Distribution and Warehousing Services, GPO*

rail conveyor system that it bought in 2020 to let employees stand in a single place and rotate between multiple agencies, rather than walking to find each item. Hunt said putting RFID trackers on every single package would allow for those packages to automatically get labeled in transit rather than having to be scanned, then labeled manually. That would also make it easier

to sort items to the correct delivery service — GPO uses the U.S. Postal Service primarily, but also DHL, FedEx and UPS.

"Where we stand right now is we are in the discussion phase, Hunt told the ***Federal Drive with Tom Temin***. "We've moved from wireless to barcode scanning to automatic picking carousels. So we're sort of walking up the chain, and now we are in the discussion of RFID. And so we are in that state and we're looking at that for our future state."

Tracking trends through data

GPO also collects data on its inventory and sends updates to its agency clients to help them make better decisions about the documents they're ordering. For example, GPO looks at what is being distributed over 30-, 60- and 180-day periods, as well as annually. This gives agencies a better picture of what is moving, what is relevant. That can translate to cost savings, where agencies can order smaller shipments, or place order more frequently, depending on demand.

GPO also tries to help agencies move documents that aren't going as quickly on their own. This takes the form of customer promotions, Hunt said. For example, GPO might recommend certain agencies stock up on a relevant document for Women's Health Month.

> ## We've moved from wireless to barcode scanning to automatic picking carousels. So we're sort of walking up the chain, and now we are in the discussion of RFID.
>
> *— GPO's Tommy Hunt*

"We look at our federal customers. What is their mission or what are their requirements? Because we want to make sure that that's utmost in what we do."

Listen to the full discussion between Federal Drive Host Tom Temin and GPO's Tommy Hunt on continuing to evolve the agency's warehouse operations

# NASA tech-forward inventory system supports unique mission

BY DAISY THORNTON

NASA has a unique mission that requires it to keep a huge inventory of specialized and varied items on hand — everything from high-quality aircraft and bespoke spacecraft parts to perishable food products and biological research materials.

That inventory averages around $6 billion in value across the agency, said Sharrief Wilson, deputy director of NASA's logistics management division. As a result, NASA requires a robust warehousing system; luckily, the agency has a long history of being on the forefront of technology.

"We were an early adopter of RFID. So we've implemented that, and we've been using RFID to do inventories, I believe, over the past 10 years. We've always looked for a new way — even upgrades, even within that technology," Wilson said on **The modernized warehouse**. "Our partners at the California Institute of Technology — that's at NASA's Jet Propulsion Laboratory — they're even going a little bit further with having readers that are attached to the warehouses. It's getting pinged as things are entering and leaving the warehouses. We were looking at some case studies to see if that would work across the full agency. And then also, NASA's using RFID on the International Space Station. So they're tracking inventories of the things on the space station using RFID as well."

> We were an early adopter of RFID. So we've implemented that, and we've been using RFID to do inventories ... over the past 10 years.
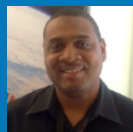
Sharrief Wilson
Deputy Director, Logistics Management Division, NASA

Many agencies are only just beginning to explore RFID and pilot its use in their warehouses. But NASA is already looking to next steps, beyond even integrated readers in the warehouses. The space agency may even invest in the production of the technology itself.

"Right now, we are purchasing from commercial vendors of tags. But then we've also started to get more advancements in the technologies where we're creating our own tags and printing

our own tags now," Wilson told the *Federal Drive with Tom Temin*. "So we were looking to expanding that as a way to centralize some of that capability but also as a cost saving. We think that we could get a return on investment over the next five to 10 years. If we invested in creating our own tags, then we would save on new procurements of tags."

Tracking the data

All of the data gathered from those RFID tags feeds into NASA's SAP enterprise inventory solution. That lets them track the items, their quantities and the total value of the property. From there, smaller subsystems plug into SAP to create a better front-end user experience. That gives everyone from end users to logistics teams to the chief financial officer and the Office of the Chief Information Officer the capability to enter, track and ensure the quality of the data.

That helps NASA maintain a full audit trail as well because sometimes it has to do research for property accountability reasons. For example, if a part fails on a spacecraft, NASA needs to know everything about where that part came from and how it was manufactured to ensure the failure doesn't happen again.

Finally, it helps the agency better manage its supply stock, so it can anticipate the needs of its components and laboratories.

"We try to take an inventory of what our mission customers are using and then how much we should keep on hand to give them a very fast capability to get that from us," Wilson said. "And then we manage to reorder points to ensure that we have the correct level of stocking of those supplies and parts of materials that they may need on a fast and regular basis."

> If we invested in creating our own tags, then we would save on new procurements of tags.
>
> — *NASA's Sharrief Wilson*

NASA's unique requirements

NASA also has some specialized requirements for the way certain products are stored. While many agencies have perishable items that require cold storage, few have as low a tolerance for imperfections or contamination. After all, making repairs to something in space is extremely difficult and expensive; making repairs to something on another planet is downright impossible.

"We go through a lot of effort to ensure that we're not degrading or damaging the property. Sometimes there's other electrostatic sensitivities to property as well," Wilson said. "So we go through a lot of detail to ensure that when we're handling it ... we're protecting the property that supports the mission."

Listen to the full discussion between Federal Drive Host Tom Temin and NASA's Sharrief Wilson on managing large supplies inventory

NOAA modernizes logistics systems for more streamlined, efficient processes

BY DAISY THORNTON

With sensors everywhere from the bottom of the ocean to outside Earth's atmosphere, the National Oceanic and Atmospheric Administration requires a robust logistics system to manage all its moving parts.

That's why Douglas Templeton, chief of the National Logistics Support Center that supports NOAA and the National Weather Service, said NOAA is currently modernizing its logistics systems. NLSC intends to update everything from the software to the business and distribution processes.

"They're older systems. They were purpose-built for us in 1989, and a lot of that computer language has changed over the years," Templeton said on *The modernized warehouse*. "And so we're in the process of doing a modernization right now where we're bringing each one of those systems up to a more current software language. They're Oracle-based."

That modernization should be complete within the next 12 to 18 months, Templeton said. NLSC has already completed upgrades to the Weather Integrated Logistics System, which is the linking mechanism between other agencies and NOAA's Consolidated Logistics Systems suite. Next in line is the CLS suite itself, and a subsystem known as Alpha, which tracks repairable parts through their repair cycle.

These upgrades are going to bring significant improvements across the enterprise, Templeton said.

Streamlining, improving logistics systems

For one thing, the overhaul will let employees view all logistics systems and subsystems from a single screen and provide a comprehensive view of the logistics process, from requisition to shipment tracking. It will also let NLSC integrate newer technologies to further modernize processes, Templeton said.

He offered barcoding of parts as a prime example.

"That language has to allow for us to be able to integrate that barcoding software," he told the *Federal Drive with Tom Temin*. "Right now, when a material handler pulls something off the shelf to ship, he brings it over to the shipping department, and the shipping department has to manually input that data into the system. Whereas with a barcode, it'd be a quick scan. And then they would be onboard to basically ship it out in a much faster method."

That's important for NLSC because emergency requisitions have to be shipped out in 24 hours,

while routine requisitions have 48 hours. That time savings from barcodes would let the center achieve its logistics mission more efficiently.

Templeton also said vendors of products already place the barcodes on the shipping boxes. That means NLSC won't be adding any work on its end. Instead, employees will take advantage of existing elements.
"We've prepped the battlefield, so to speak, with the barcodes already in place, so that when our technology catches up, then we integrate it right into the system," he said.

Training and preparing for next-gen team

Templeton also said this process would be easier for employees and customers. NLSC won't have to retrain the entire customer base or its employees on a new system. The existing one will simply be more efficient, he said.

And that's important because Templeton said NLSC is currently going through a retirement cycle. Of the 24 employees that work there, the majority have done so for more than 20 years, and a number have either recently retired or are preparing to do so.

That means Templeton has been managing the knowledge capture process to ensure that the institutional knowledge absorbed by those long-term employees transfers to their replacements. Always a difficult proposition, it would be much more so if NLSC adopted an entirely new set of systems and processes immediately after the new employees spent a year shadowing experienced employees and learning the current ones. 🎏

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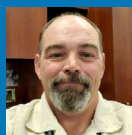
Douglas Templeton
Chief of the National Logistics Support Center, NOAA

Listen to the full discussion between Federal Drive Host Tom Temin and [NOAA's Douglas Templeton on streamlining weather agency's parts logistics](#)

New warehouse management system helps DLA track materials, ship them to warfighters efficiently

BY DAISY THORTON

The Defense Logistics Agency is strengthening its internal controls and financial practices, while simultaneously tracking inventory more accurately and moving it more efficiently by implementing new warehouse management systems.

The WMS includes automated identification technology, as well as barcode and radio frequency identification scanning. Perry Knight, deputy commander of distribution at DLA, said the distribution team by late summer was a little more than halfway through fielding the new systems. Meanwhile, Col. Woodje Caldwell, deputy director of disposition services at DLA, said his team had recently completed the implementation.

"It really is a state of the art system designed in a modular sort of way that brings the focus for us — brings the goods to person — to eliminate a lot of the inaccuracies in visibility that we had in the past," Knight said on _The modernized warehouse_.

Caldwell said Disposition Services is primarily focused on the barcode capabilities, particularly making them more user friendly. Because Disposition Services is in charge of disposal

> For our scan guns that we have today, it will tell a worker whether they're at the right bin face, where that material is stored, either to stow it, to put it away or to actually pick it for movement or shipment. … It really does increase the speed.

Perry Knight
Deputy Commander of Distribution, DLA

of Defense Department materials, tracking inventory as accurately as possible is important to ensure that everything marked for disposition can be accounted for.

Some of that property gets repurposed outside of DoD, often by state and local governments. Using barcodes compliant with military standards helps ensure that property gets to where it's going quickly and efficiently, Caldwell said.

Meanwhile, DLA Distribution, which focuses on getting materials to warfighters and other DoD personnel, is planning a pilot for automated inventory using radio frequency identification. Knight said that will involve using drones to pick up the RFID signals and verify quantity and locations. The approach will be particularly useful in situations where an item has to be temporarily moved, like a vehicle undergoing maintenance, he said.

"We'll have a greater ability to use [RFID] to capture all the pertinent data. We'll know where [our items] are located," he said on the *Federal Drive with Tom Temin*. "And certainly on any

given day, or whatever frequency we determine, be able to determine that we have the right quantity that is on record in our automated record systems."

In that way, DLA hopes to gather more information about its inventory while simultaneously reducing the staff and time needed to manage its inventory logistics.

How automation helps with DLA inventory management

Knight also hopes automation will make it easier for workers to pick and ship items.

"Let me give you an instance: For our scan guns that we have today, it will tell a worker whether they're at the right bin face, where that material is stored, either to stow it, to put it away or to actually pick it for movement or shipment to a DOD or whole-of-government entity," he said. "It really does increase the speed. We've employed voice technology for a little over two years now. Certainly, it has helped improve the accuracy. They are at the right place to pick the

right item. There's even a photograph or picture, if you will, of that particular item to ensure that they have it."

The next step down this path, which Knight said is being fielded at one facility currently, is the use of robotic arms to improve the efficiency of the picking process. The robotic arm is capable of removing items from the warehouse's internal system for moving items around, packaging them together and delivering them internally in the warehouse to be shipped externally.

DLA Distribution is also working on a facility with similar automated robotic delivery capabilities.

Caldwell said DLA's deployment teams have come into every facility to train them on the new WMS and ease users into a level of comfort with the new technologies. That increased confidence on the part of the workforce has also contributed to improved efficiencies, he said. But that training is not always a quick or easy process.

"Folks naturally fall into a rut. and they get comfortable with how we do things. So as we upgraded and we incorporated WMS right, it's the whole fear of the unknown," Caldwell said.

But the new WMS is taking hold. "Our workforce has really embraced it and risen to the challenge of incorporating WMS within our processes," he said. "They understand the why, and they see the benefit of incorporating WMS as our system." 🌀

> ***Listen to the full discussion between Federal Drive Host Tom Temin and DLA's Perry Knight and Col. Woodje Caldwell on gaining materials management efficiencies***

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Col. Woodje Caldwell
Deputy Director of Disposition Services, DLA

NAVSUP pilots new RFID inventory system, integrates with Marine Corps solution

BY DAISY THORNTON

When the Navy needs basic parts like bolts, it turns to the Defense Logistics Agency like the rest of the Defense Department. But when it needs a part with no application outside of the Navy — like a system that goes inside a submarine — that's where the Naval Supply Systems Command comes in.

With eight fleet logistics centers around the globe that manage roughly 430,000 items worth about $45 billion total, NAVSUP is constantly looking to improve its tracking systems so it doesn't lose anything. That's why the command is piloting a new kind of radio frequency identification technology.

The Naval Autonomous Data Collection System (NADACS) uses a mist RFID protocol, which forms a mesh network and provides real-time location. NAVSUP will also use improved passive RFID.

"We have a pilot that was started this year down at Fleet Logistics Center Jacksonville. We're looking to incorporate also the Marine Corps solution, which is the Marine Corps Platform Integration Center," John Ballou, automatic identification technology program manager at NAVSUP, said on *The modernized warehouse*. "It's gotten some notoriety recently with the Marine Corps passing audit and, with that clean audit opinion, they've credited MCPIC with really being able to enhance that. So we're looking to take the goodness there with the MCPIC team and integrate it with NADACS as another means of data ingestion."

Other tracking tools

But NADACS isn't the only tool NAVSUP uses to track its inventory. Ballou said Navy Enterprise Resource Planning is the accountable system of record and the go-to for shore facilities to ensure an accurate count. He said other systems are also sometimes used on the supply side.

And Cmdr. Jason Harnish, a deputy division director for materiel management at NAVSUP,

> If I were on the deck plate and I'm looking for a piece part and I don't have it, I would go into One Touch and look in there and see where it is in the world.
>
> **Cmdr. Jason Harnish**
> *Deputy Division Director for Materiel Management, NAVSUP*

said One Touch Support is what he currently uses for worldwide location visibility.

"If I were on the deck plate, and I'm looking for a piece part and I don't have it, I would go into One Touch and look in there and see where it is in the world because you can put in the stock number," he said on the *Federal Drive with Tom Temin*. "The SKU is what outside of the military would be what we refer to as a NIN, the national identification number. So I would plug the NIN in One Touch and then there's a tab in there that says inventory. And it would let me know where it is potentially in the world at a given time."

Navy Working Capital Fund

All of these materials NAVSUP deals with, Harnish said, are Navy Working Capital Fund materials, the name given to parts that are unique to the Navy. Those also have special requirements. For example, Harnish said a certain percentage of those parts have to come from DoD's organic industrial base, rather than from commercial vendor suppliers. That percentage varies based on the weapons system and what are considered critical parts.

That also requires a standardized, specific approach to the acquisition process on the commercial side. Anything that comes from a commercial vendor has to include the necessary data to work across the entirety of NAVSUP's enterprise.

Listen to the full discussion between Federal Drive Host Tom Temin and NAVSUP's John Ballou and Cmdr. Jason Harnish on testing RFID inventory system

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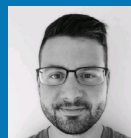
John Ballou
Automatic Identification Technology Program Manager, NAVSUP