

An aerial, long-exposure photograph of a complex highway interchange at night. The image is dominated by vibrant, multi-colored light trails from cars, creating a sense of motion and connectivity. The trails are primarily blue and white, with some red and yellow accents. The roads curve and loop, forming a large, circular interchange on the right side of the frame. The overall atmosphere is futuristic and dynamic.

DRIVING THE FUTURE OF TRANSPORTATION AND LOGISTICS

A Honeywell Report

Honeywell

DRIVING THE FUTURE WITH FORESIGHT AND SEAMLESS SOLUTIONS

The transportation and logistics industry is confronting immense changes that are bringing great opportunities to providers. Along with advancing technology, there's new market entrants, greater customer expectations and developing business models. These changes are being driven by a combination of forces, including advances in technology, a surging U.S. economy, the Amazon effect and the intense regulatory environment. Today's customers expect a quick and seamless omnichannel shopping experience.

Gartner²⁰ reports the Covid-19 crisis has been a catalyst for supply chain transformation, but radical change still lies ahead. As recovery from the pandemic continues, CEOs see digitization as a key to shaping business opportunities in the decades ahead.

In addition to significant external changes, T&L/ Maintenance & Inspection (M&I) are also facing a growing shortage of labor and increasing compliance and regulatory requirements. Balancing organizational needs



for automation with worker satisfaction and productivity is a deliberate act.

The exponential growth of e-commerce has forced T&L providers to re-think their operations, use technology to meet rising demands, facilitate outcome processes, and support strategic decision making, especially when it comes to the workforce.

This report examines focus areas as they relate to and support to the future of transportation, supply chain and logistics. Together with industry experts, Honeywell is

committed to navigating these complex challenges with an eye on future.

Honeywell is on the forefront of technology enabling businesses to connect, automate and deliver from origination to delivery and react rapidly to changes.

HONEYWELL IS HERE TO FUEL POWERFUL BUSINESS OUTCOMES.



E-COMMERCE CART TO CUSTOMER



HONEYWELL DELIVERS

Honeywell supports e-commerce and our T&L partners with a curated experience. Our mobile devices harness innovative scan engines and proprietary software to capture images, scan barcodes – even at a distance – and upload the images to the customer to keep him/her apprised of the process of getting parcels from cart to customer. Customers have accurate data at their fingertips and seamless delivery to their doorstep. Honeywell solutions strategically connects the end-to-end journey to deliver on ever-increasing customer expectations with their e-commerce purchases.

Customers have an e-commerce whatever-whenver expectation...this translates that goods must travel from multiple pick-up locations, including DCs, warehouses and stores to multiple destinations such as private homes, stores or lockers, according to Forbes Insights.²¹

McKinsey & Company analyzed the impact of Covid-19 on e-commerce. In just 90 days when the pandemic hit, the economy experienced 10 years of e-commerce growth. In the last decade, e-commerce sales worldwide have grown six fold from \$572 billion in 2010 to \$3.5 trillion at the end of 2019.²⁴

Logistics Management: All of this volume is not only affecting the freight market in ways that weren't predicted even five years ago, but also shifting shipment size and volumes toward parcel and less-than-truckload (LTL) from truckload and inter modal. However, the biggest impact of e-commerce has clearly been on the parcel business.²⁸

Gartner reports, "69% of supply chain organizations expect a decrease in consumer willingness to visit stores over the next five years. There's a balance to be made between cost control with improved customer experiences."¹⁸

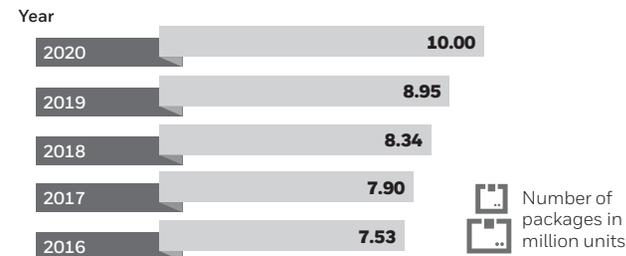
Gensler details, "The dramatic expansion of e-commerce, and with it distribution and last-mile logistics, have been noticeably affected by volatility in the trucking industry."²⁷



In early 2021, 3PL reported¹³ the T&L biggest opportunities:
(multiple responses allowed)



Average daily package volume



Source: Statista²⁸, January 2021



In the United States, according to 3PL, e-commerce revenue saw a record 45% jump from Q1 to Q2 in 2020.



LABOR & WORKFORCE



HONEYWELL DELIVERS

Honeywell M&I streamlines repair and inspection processes while documenting every step to enable strict compliance with regulations or standard operating procedures (SOPs). This solution provides clear, step-by-step directions to technicians in fast-paced and physically demanding environments... it makes getting workers up to speed more efficient, reduces errors due to lack of experience, and adds value throughout the process.

3PL's Benchmark Warehouse Report finds, "... 52% 3PLs say driving operational efficiency represents their number one challenge while they look to optimize processes, reduce manual workloads, and automate workflows to save time in the warehouse."¹³

In connected infrastructures, DCs can utilize augmented reality technology to connect their maintenance crews with remote expert support that can see what they are dealing with in real time, eliminating both the communication limitations of a standard telephone call and the safety concerns of handheld devices. **These solutions help businesses achieve higher levels of productivity and accuracy.**

Driver shortage will impact capacity and efficiency. **Many drivers are over 50 and taking retirement.**¹⁰ — *GlobalTranz*

Logistics UK survey concluded logistics providers expect a severe or very severe problem to fill vacancies. 68.5% responded filling vacancies for Heavy Goods Vehicle (HGV) would be a severe/very severe issue, and 34.3% of respondents identifying filling technician, mechanic, and fitter roles as a severe/very severe problem.⁶

Logistics UK⁶ survey results



In early 2021, 3PL reported¹³ the T&L biggest opportunities: (multiple responses allowed)



The United States' trucking industry is **experiencing a severe shortage of diesel technicians**, with the Tech Force Foundation estimating future demand for more than 29,000 new technicians in 2019 and more than 25,000 annually from 2020 to 2022. This shortage could cause transportation delays if preventive maintenance and repairs can't be conducted efficiently.³¹



Yearly demand for new technicians:

2019	2020	2021	2022
>29K	>25K	>25K	>25K



Labor and impact on new supply chain workers:

Labor	Need	Costs	Supply
↓	↑	↑	Ⓜ



Shortage of U.S. qualified truck drivers:

60K present	Estimate: American Trucking Associations ³¹	160K 2028	Estimate: Bob Costello, chief economist, ATA ³¹
-----------------------	--	---------------------	--



Honeywell Smart Talk™ provides constant and instant communication for mobile-equipped workers. This decreases the need for team huddles or group meetings while facilitating remote training and trouble shooting.

LAST-MILE DELIVERY



HONEYWELL DELIVERS

Accuracy and transparency of data is essential to achieve and maintain a 5-star customer experience. Honeywell supports these efforts with both a curated experience and immediate satisfaction with customer demand. Honeywell mobile computers harness innovative scanning to upload information and images to the customer.

The courier, express and parcel (CEP) market is one of the strongest growing sectors of the T&L industry in a number of markets. The CEP market is also an area where changes in demographics and consumer behaviors could have the most significant impact.⁸

GPS and delivery management software are instrumental in providing location, synchronization and velocity. These solutions offer a visual of where the driver is, how far he/she has traveled in route, who the customers are, the order for deliveries and how long before a specific customer delivery.¹⁸

Honeywell's partnership with FarEye delivers advanced last-mile execution with actionable predictive visibility that results in customer satisfaction across the purchase journey. The Cloud-based platform can manage the complete life cycle and can predict upcoming challenges before they happen.

Horizontal collaboration is happening in last-mile delivery models. Companies, such as FedEx and DHL, have partnered with the national postal service and smaller local providers to improve efficiency of delivery.¹²

Last-mile delivery is traditionally the most expensive part of every product's journey.²¹

Last-mile delivery models have evolved to include regional, crowd-sourced and autonomous delivery providers.¹¹



Consumers who want to stay informed about the delivery process and experience a high level of service with goods delivered at a specified time and day.⁵



According to Gartner¹⁸, the choices customers made for online purchases during the pandemic will drive and shape shopping behaviors and **change the way retailers will deliver last-mile fulfillment services.**



Forbes²¹ predicts **78% growth through 2030** in urban last-mile deliveries.

Last-mile delivery market in North America³² 2021-2025



The market is **fragmented** with several players occupying the market



Honeywell Voice Automation empowers workers with accurate, on-the-spot information to efficiently guide them through complex tasks in order to achieve 99.99% accuracy rates – delivering what customers want, when and where they want it.



DRONES & DROIDS



HONEYWELL DELIVERS

Honeywell fuels innovation from first to last mile. While working collaboratively with our partners and customers, Honeywell uses the latest technologies – artificial intelligence, automation, robotics – in combination with our well-established solutions like scanning, RFID and voice to deliver leading-edge customer solutions. And, we never stop learning and pushing the envelope to develop forward thinking products and services.

Cognizant reports, “Droids and drones will increase delivery and reduce road congestion.”⁹ McKinsey & Company’s researchers agree, adding that by increasing the use of delivery robots, T&L firms may generate significant positive environmental and efficiency impacts.²⁴

To satisfy customers’ ever-rising desire to buy products online – without any current droid and drone intervention – vehicles in the top 100 cities globally will increase by 32% and congestion will rise by 21%. This equals an additional 11 minutes of commute time for each driver daily.²¹

– *Forbes Insights*

Robots can be very supportive of last-mile delivery efforts. However, stakeholders are critical for widespread deployment of delivery droids.²³ To prepare for widespread deployment of delivery droids, stakeholders can collaborate in eight areas.²⁴

– *McKinsey & Company*

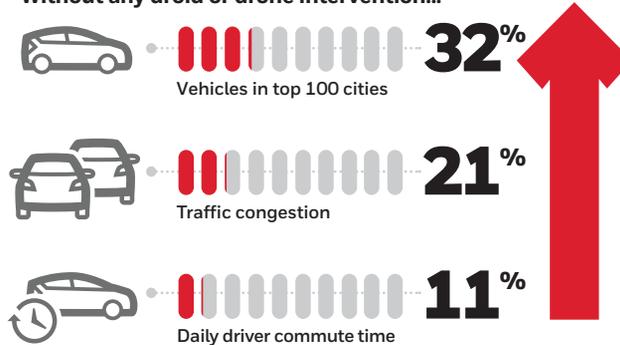
“Disruptive technologies, such as **drones and droids, are shaking up entire delivery chains.**”²²

– *World Economic Forum*

In Florida’s adult communities, **drones actively move and deliver prescriptions...** from pharmacy to customer.²⁸

FedEx’s Memphis hub utilizes **robots to unload their trailers and organize goods.**²⁸

Without any droid or drone intervention...



Eight areas of collaboration for widespread delivery droids use

REGIONAL	NEIGHBORHOOD	TRUCK TO DOOR
Sorting at centers	Delivery via trucks	Delivery with droids
1. Standardizing physical bases of area optimization	4. Mapping out potential parking spaces	7. Developing detailed map data for location mapping
2. Building a data-collection/sharing system for network optimization	5. Regulating roads in a harmonized way across urban areas	8. Logistics unified rules for unmanned vehicles to be deployed
3. Creating practical guidelines for joint delivery operations	6. Buying a parking-space-reservation system (including supply/demand management and allocator)	



Droids can increase the speed of delivery as they can traverse challenging terrain and can reduce environmental impact.



DATA, INTELLIGENCE & DIGITIZATION



HONEYWELL DELIVERS

Working collaboratively with our partners, Honeywell creates cutting edge solutions using the latest technologies such as quantum computing, AI, automation and robotics, in conjunction with established Honeywell solutions. Honeywell continually invests in developing new value for T&L by developing new technologies and solutions to address real customer needs. Working across GBE functions, we can offer competitive solutions for operational advantage.

From Forbes: Advanced technologies of Industry 4.0, such as artificial intelligence (AI), machine learning (ML) and IoT will help create a digital enterprise in which data collected from physical systems drives intelligent action back in the physical world.²¹

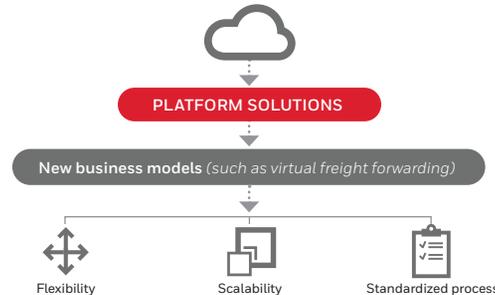
Cognizant reports, “Advanced technologies can resolve ‘last-mile’ delivery challenges with the rise of V2X solutions, vehicles will soon be able to communicate with other vehicles (V2V), with pedestrians (V2P) and with the transportation infrastructure (V2I) to create spatial awareness and monitoring to allow safe, autonomous vehicles to thrive.”⁹

Nearly 2/3 of respondents in Forbes’ study anticipate significant productivity benefits with the help of technology. AI, ML and block chain give logistics teams greater visibility into actual assets in use, as well as upcoming or unexpected demands which allows them to better optimize routes and equipment.²¹

Gartner reports on supply chain digitization: **23 % of supply leaders expect to have a digital ecosystem by 2025, up from 1% today.¹⁸**

Fully modernizing logistics with a data-led approach looks less like an “if” and more like the inevitable “when”. This approach will provide **scrutiny that will magnify down to the level of each individual item in a transport crate.⁷**

Cloud technology enabling platform solutions¹²



8 TECH TRENDS ¹⁹	
1	Cloud technology
2	In-memory computing
3	Digital twins
4	Machine learning and AI
5	Mobility
6	Robotic process automation
7	IoT
8	Business networks

Source: Gartner's Supply Technology¹⁹



Respondents in a Forbes' study anticipate significant productivity benefits with the help of technology



Honeywell's Operational Intelligence offers new ways to both error-proof and future-proof T&L businesses. The Mobility Edge™ Platform is a durable, stable and secure foundation for effective, long-lasting solutions.



DATA, INTELLIGENCE & DIGITIZATION



HONEYWELL DELIVERS

Working collaboratively with our partners, Honeywell creates cutting edge solutions using the latest technologies such as quantum computing, AI, automation and robotics, in conjunction with established Honeywell solutions. Honeywell continually invests in developing new value for T&L by developing new technologies and solutions to address real customer needs. Working across GBE functions, we can offer competitive solutions for operational advantage.

Teradata explained, “End-to-end visibility through an endless loop of data makes a solid foundation for T&L reports and analytics. For the entire supply chain, this minimizes wasted resources and maximizes the use of time”.⁷

The future of logistics will be **defined by data, analyzed by artificial intelligence and driven by machines.** Gartner has predicted by 2023 that artificial intelligent techniques will be embedded across 50% of supply chain technology solutions.¹⁸

79 % of supply chain leaders think that an Internet/platform-based approach is the most critical new business model to support post-pandemic recovery.¹⁸

Digitalization threatens to fundamentally disrupt logistics, but could also **unlock \$4 trillion of value** for the industry and wider society.”²²

– World Economic Forum

Key actions to **secure success in the new normal**²⁴:

- ✓ End-to-end planning and information flow
- ✓ Digitization and process automation

– McKinsey & Company

2023: AI techniques predicted in 50% of supply chain¹⁸



Future of logistics



Data defined



AI analyzed



Machine driven

T&L leaders report technology systems implemented¹³

(multiple responses allowed)



Warehouse management system



Mobile bar code scanning



Order management system



Transportation management system



Largest year-of year-increase in adoption

Source: 3PL



The missed opportunity lies in data – the T&L industry is barely scratching the surface on how things can be done better.⁷

COMPLIANCE & REGULATIONS



HONEYWELL DELIVERS

T&L providers need the tools to ensure compliance with government regulations for traceability. Honeywell has developed modernized supply chain technology that enables T&L providers to adapt and scale processes from point of manufacture to sorting to last-mile delivery. FarEye provides real-time supply chain visibility of packages and freight on a granular level. It also optimizes cross-dock operations with real-time visibility of goods and reconciliation of inventory.

As markets expand and international trade grows, the need for updated, accessible and accurate regulatory information becomes critical to ensure global trade and regulatory compliance, brand protection and cost savings/avoidance.³³

— IDC

“New trade corridors between Asia and Africa, Asia and South America and within Asia will re-chart global supply chains. **Trade markets will shift toward emerging markets** and the last developed countries will take their first steps into the global marketplace.”⁸

— PriceWaterhouse Coopers

New trade corridors are already becoming visible, and those companies able to capitalize on them will benefit most from the evolution of global trade. Several countries were identified as all emerging markets with unique fundamentals to grow business.⁸

— PriceWaterhouse Coopers

According to IDC, “**There’s a steep incline in regulatory control** due to rampant food and pharmaceutical recalls that occurred in the mid 2010s.”³³

Hotwire reports, “With regulation changing at a rapid rate, and the need for accurate traceability of products heightened, **T&L cannot afford to let compliance standards slip.**”³

PriceWaterhouse Coopers: “Changing regulations will have a major impact on the supply chain.”⁸

New track and trace regulations worldwide:



Food and beverage	Pharmaceutical	Manufacturing
Farm to fork traceability	Complete genealogy of products	Constant visibility of the millions of parts used to build cars, trucks, and planes to assure fast location, recall, and replacement of parts

Countries with emerging markets for growing business:



IDC reports that data management requirements will continue to become more demanding as regulatory bodies continue to pass new legislation to ensure the safety of food and pharmaceutical products.³⁰



To reduce risk across the supply chain network, visibility is necessary. As exceptions occur, visibility remains critical to take corrective action and maintain agreed-upon service levels.³⁰

COLLABORATION & SUSTAINABILITY



HONEYWELL DELIVERS

Providers must meet or exceed the service needs of customers both in ways they expect, and in ways they have not yet imagined. This includes collaboration throughout the process and making a demonstrated commitment to sustainability. To this end, Honeywell has made a commitment to drive sustainability in all aspects of business.

Shippers, carriers and 3PLs can reduce their carbon footprint and establish themselves as environmental leaders by considering a framework of sustainable supply, operations, service and collaboration.¹¹

According to Fortune Business Insights, over the last decade, increasing carbon emissions and temperature rise have compelled companies to look for alternative sources of energy. “We are looking at renewable energy to fuel demand for IRM services.”¹⁷

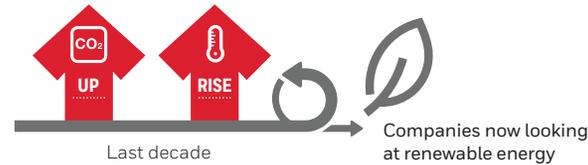
To reduce risk across the supply chain network, **visibility is necessary**. As exceptions occur, visibility remains critical to take corrective action and maintain agreed-upon service levels.³⁰

Shippers and carriers increasingly grasp threats from climate change and are **taking important steps to embrace sustainability in logistics**.¹¹

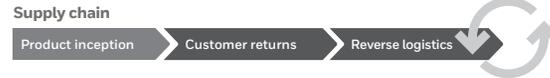
Cognizant says, “Supply chains need to be fully circular, or at least should not negatively impact the planet or people.”⁹

IDC reports that by introducing more transparency into the process, it **encourages more collaboration and problem-solving to ensure timely and efficient delivery**.³³

Renewable energy on the rise



The role T&L plays in the end-to-end supply chain places it as a key enabler of a circular economy¹⁶



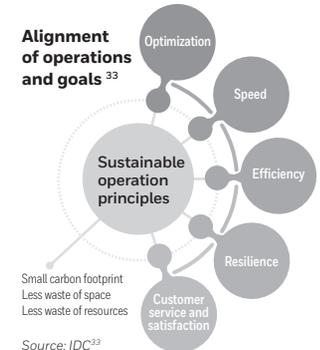
Communication between shipper and consumer³³

TWO-WAY COMMUNICATION



Source: IDC³³

Alignment of operations and goals³³



Source: IDC³³



Honeywell Voice Guided Work enables operations to efficiently handle e-commerce volumes, speeds, complexity and collaboration within warehouse and distribution centers.

HONEYWELL SOLUTIONS

TO LEARN MORE ABOUT HONEYWELL SOLUTIONS, VISIT

<https://sps.honeywell.com/us/en/products/productivity>



GUIDED WORK VOICE-DIRECTED M&I

Honeywell is a leading provider of innovative voice technology solutions, helping companies with mobile workers run a better business with voice. Our voice solutions provides streamlined best-in-class business processes to take an organization to the next level of operating efficiency.



THE MOBILITY EDGE PLATFORM

The Mobility Edge™ platform is a durable, stable and secure foundation that companies can use to build long-lasting solutions that deliver competitive advantage. The platform enables a longer productive life, superior security, optimized performance, and accelerated deployments.



SMART TALK

Honeywell Smart Talk™ is a unified workforce communications application that tackles the problem of fragmented communications, with enterprise-grade security for voice calling, text and media messaging, and user presence – all from one device. It's the perfect solution for small or large enterprises battling the growing demands of a BYOD and mobile workforce.



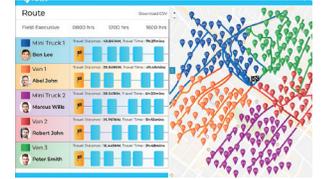
OPERATIONAL INTELLIGENCE

Operational Intelligence is a centralized, cloud-based platform to manage the complete life cycle, operational visibility and performance information of assets, people and tasks. It bridges the productivity gap commonly missed by asset management or mobile device management solutions.



PRINT & SCANNING PRODUCTS

Honeywell improves workflows by aligning the right mobility solutions to each environment. Our hand-held devices, printers and scanners enable the user to have full visibility through the process. These rugged, all-purpose productivity tools ensure ultra-reliable performance, data connectivity and communication throughout the supply chain.



FAREYE

Honeywell has partnered with FarEye to deliver a robust SaaS package delivery management platform that maximizes delivery efficiency while providing a customer-friendly experience. FarEye software can optimize a business' logistics in three key ways: advanced last-mile execution platform, actionable predictive visibility platform and customer satisfaction across the purchase journey.

BIBLIOGRAPHY & RESOURCES

- ¹ Honeywell Internal Document
- ² Honeywell In Transportation and Logistics PowerPoint
- ³ Sofiene Regaieg. (2021, September 23). Honeywell T&L: LinkedIn Blogs: Supply Chain Transformation. Hotwire. <https://hotwireglobal.com>.
- ⁴ Barry Ewell. (2020). How Last-Mile Delivery is Using Technology to Keep Up with Delivery Volume. Honeywell blog.
- ⁵ Honeywell T&L Vertical PowerPoint
- ⁶ Wells, D. (n.d.). Logistics Report 2021: The Resilience of Our Sector Across All Modes. Logistics UK.
- ⁷ Bisgaard-Bohr, M. (2020). After Covid, Is the Transportation and Logistics Industry An Open Goal for Dominance by Data Giants? Teradata BrandVoice.
- ⁸ PriceWaterhouse Coopers. (Ed.). (2021). Volume 3: Emerging Markets – New hubs, new spokes, new industry leaders. Transportation and Logistics 2030.
- ⁹ Cognizant. (Ed.). (2021). The Future of Transportation and Logistics. <https://www.cognizant.com>
- ¹⁰ GlobalTranz. (Ed.). (2021). White Paper: 2021 Logistics and Supply Chain Trends and Outlook. <https://globaltranz.com>
- ¹¹ Kearney. (2020). CSCMP's Annual State of Logistics Report: Top Take-aways. <https://kearney.com>.
- ¹² PriceWaterhouse Coopers. (Ed.). (2021). PwC's Future In Sight Series. Shifting Patterns: The Future of Transportation and Logistics.
- ¹³ 3PL. (Ed.). (2021). 2021 Third-Party Logistics Warehouse Benchmark Report.
- ¹⁴ 3PL Central. (Ed.). (2021). 2021 State of the Third-Party Industry Report, Trends for Becoming a Resilient and Innovative 3PL.
- ¹⁵ Honeywell Voice Guided Work brochure
- ¹⁶ Fortune Business Insights. (Ed.). (2020, June). Inspection, Repair and Maintenance Market Size, Share & Industry Analysis. Report FBI102983.
- ¹⁷ Fortune Business Insights. (Ed.). (2020, June). Inspection, Repair and Maintenance Market Size, Share & Industry Analysis. Report FBI102984.
- ¹⁸ Gartner. (Ed.). (2021). Future of Supply Chain: 5 Changes for Supply Chain Leaders to Act on Now.
- ¹⁹ Gartner. (Ed.). (2021). Gartner for Supply Chain: Future of Supply Chain Technology, 8 Technology Trends to Watch Now.
- ²⁰ Gartner. (Ed.). (2021). Executive Report Excerpt: Creating a Nontraditional Supply Chain.
- ²¹ Forbes Insights. (Ed.). (2020). Logistics, Supply Chain and Transportation 2023: Change at Breakneck Speed.
- ²² World Economic Forum. (Ed.). (2020, January). The Future of the Last-Mile Ecosystem: Transition Roadmaps for Public- and Private-Sector Players.
- ²³ Gartner. (Ed.). (2021). TMS Overview. Gartner Supply Chain and Technology Team.
- ²⁴ Dekhne, A., Hastings, G., Murnane, J., & Neuhaus, F. (2021). Travel, Logistics, and Infrastructure. McKinsey and Company.
- ²⁵ Houlihan Lokey. (2020). Transportation and Logistics: Industry Update Winter 2020.
- ²⁶ Harris Williams. (2021) Transportation and Logistics: Industry Update August 2021.
- ²⁷ Sargent, Brion. (2021, October 12). As E-commerce Booms, Transportation Logistics Are Shifting to Meet Demand. Gensler. <https://www.gensler.com/blog/as-e-commerce-booms-transportation-logistics-are-shifting>
- ²⁸ Bentz, Brooks. (2021, March 9). E-commerce Boom: Welcome to the new reality. Logistics Management. https://www.logisticsmgmt.com/article/e-commerce_boom_welcome_to_the_new_reality
- ²⁹ Griffith, Gabrielle. (2019, January 8). 2019 Trade Update: Compliance issues in focus. Logistics Management. https://www.logisticsmgmt.com/article/2019_trade_update_compliance_issues_in_focus
- ³⁰ Datex. (2021). What is New in Track and Trace Technology? Compliance & Regulations, SlideShares, Technology, Warehouse Operations.
- ³¹ Langley Jr., C. John Ph.D.. (Ed.). (2021).2020 Third Party Logistics Study. The State of Logistics Outsourcing.
- ³² Technavio. (2021, January). New Last Mile Delivery Market in North America Research 2021–2025; COVID-19 Impact and Recovery Analysis (Technavio). BusinessWire. <https://www.businesswire.com/news/home/20210121005341/en/New-Last-Mile-Delivery-Market-in-North-America-Research-2021-2025COVID-19-Impact-and-Recovery-AnalysisTechnavio>
- ³³ Speer, J. K., & Ellis, S. (2021, June). IDC's Worldwide Digital Transformation Use Case Taxonomy, 2021: Transportation and Logistics (#US47972714). IDC. <https://www.idc.com/research/viewtoc.jsp?containerId=US47972714>





For more information

<https://sps.honeywell.com>

**Honeywell Safety and
Productivity Solutions**

855 South Mint Street

Charlotte, NC 28202

800-582-4263

www.honeywell.com

Honeywell Productivity Solutions
& Services T&L M&I Report | Rev A | 01/22
© 2022 Honeywell International Inc.

Honeywell