5G HQ

Pioneering The New 5G Era In Transportation And Logistics

How T-Mobile® For Business Can Help Fuel An Industry Transformation, Today And Tomorrow.

T-MOBILE FOR BUSINESS

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Introduction

Transportation And Logistics Is The Lifeblood Of Our Economy. Companies Are Using 5G To Uncover Exciting Possibilities Across Their People, Fleets, Assets, And Workflows.

5G is propelling monumental changes at a pivotal time for the transportation and logistics (T&L) industry. After successfully evolving over the last decade to meet ever-changing trade partner needs, accelerating global trade, and rising customer expectations, T&L organizations are primed for 5G. With new technologies and enhanced digital workflows, organizations can drive innovation and alleviate pressure in mission-critical moments.

The COVID-19 pandemic was one such moment. Global shortages, high demand, workforce uncertainty, and regulatory changes rocked the industry. T&L insiders and customers alike recognized how old ways of operating created vulnerability in our supply chains. Commercial aviation also faced challenges, with severe demand fluctuation, an unpredictable international landscape, and more. In the midst of this, air cargo increased to become a greater share of total revenue for airlines.

McKinsey estimates that it will take freight and logistics companies three to five years to recover from the COVID-19 pandemic.[1] While the crisis was unavoidable, many realize that key pre-pandemic investments could have reinforced people and processes through tough times. There are still opportunities for companies that act fast. With connected technologies and digital processes for improved visibility, organizations can strengthen their operations and build resilience moving forward.

[1] https://www.mckinsey.com/industries/travel-logistics-and-infrastructure/our-insights/us-freight-after-covid-19-a-bumpy-road-to-the-next-normal

Data-Fueled 5G Innovation

In transportation, almost every segment and node in the supply chain produces accessible data. Industry leaders can use robust data to boost operational efficiency and flexibility, reduce fuel consumption, improve safety, and enhance the customer experience.

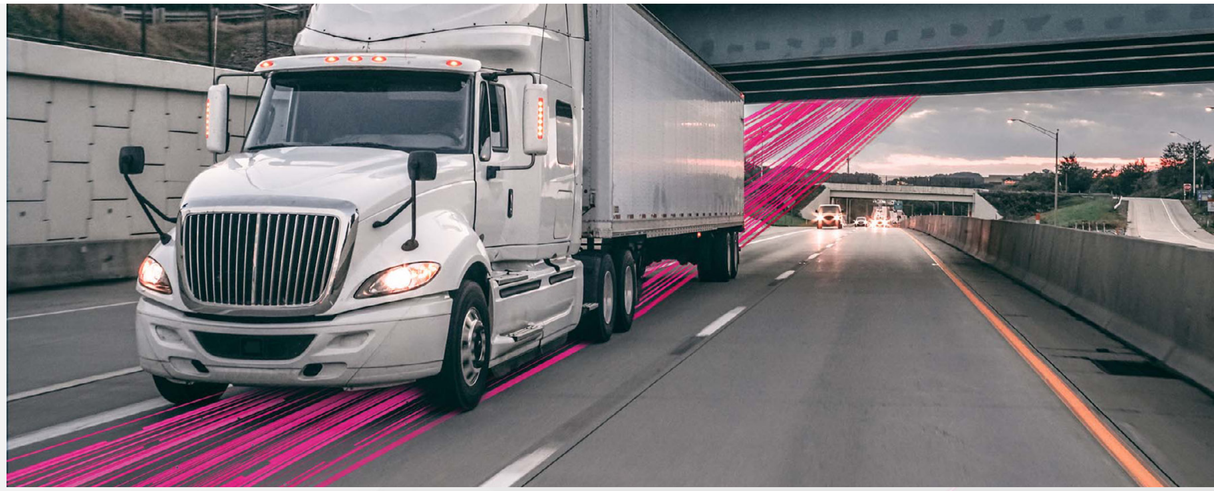
Resilient T&L organizations are turning obstacles into opportunities, using today's changing environment to position themselves for growth and flexibility.[2] Companies strengthen their metrics by focusing where advanced technology platforms can do the most for efficiency, safety, and business results. Many rely on 4G connectivity to maintain processes. 5G will enhance and unlock new opportunities.

Digital Transformation In Logistics Is Expected To Account For $1.72T In Investments By 2025.[3]

5G connectivity is and will be the key facilitator, fueling:

- Real-time data to prevent disruptions and improve decision-making
- Enhanced opportunities for asset management
- Instant communication with all supply chain partners

[2] https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/lessons-from-growth-outperformers-in-logistics
[3] http://reports.weforum.org/digital-transformation/the-digital-transformation-of-logistics-threat-and-opportunity/
[4] https://www.idc.com/getdoc.jsp?containerId=US46930520



Modernization And Resilience With Wireless Networks.

New technology is the number one driver of change in the supply chain.[4] Industry-wide, organizations use wireless networks to uncover critical efficiencies and optimize processes. 5G is already streamlining communications throughout T&L. As we speak, 5G is modernizing processes and challenging what's considered possible—from business-wide decisions to siloed workflows.

While there's no predicting every challenge or crisis, the right kind of wireless coverage is an investment in stability. Today, T-Mobile covers 96.5% of interstate highway miles—more than anyone else—helping to connect distribution managers, operators, and drivers at critical points across the way. We also plan to expand our 5G network deep into rural areas, with plans to cover 85% of rural Americans next year and 90% within four years.

Interstate miles based on analysis by T-Mobile of Ookla® CoverageRight™ from Q4 2021 and Speedtest Intelligence® 5G background scans in Q4 2021. Ookla trademarks used under license and reprinted with permission.

Supporting Existing Investments And Uncovering New Possibilities

With more access points, devices, and automation, the T&L ecosystem is evolving at an incredible rate. Successful organizations in the digital age will weigh current process improvements and new system investments. In other words, it's time to carry the innovative spirit of T&L into the next phase.

As technology advances, exciting new use cases will emerge and scale. Faster data transfer and lower latency will enable a more responsive network to facilitate change. Logistics processes will become faster, safer, and more dependable. Artificial intelligence (AI), predictive analytics, robotics, and more will transform how the industry operates. Making the most of innovation today and preparing for the future requires a network that blends speed, reach, and high-capacity infrastructure.

Here's What 5G Makes Possible In T&L— NOW And NEXT

1 Enhancing Visibility
2 Optimizing Performance
3 Improving Safety
4 Maximizing Revenue

Enhancing Visibility

Greater Process Visibility Presents T&L Organizations With Opportunities To Improve Processes And Elevate New Potential.

NOW

Connectivity Is The Foundation For Daily Operations In T&L.

Unlocking value in the supply chain begins with greater visibility to manage risk—whether it's related to asset management or driver processes.

Today, 90% of logistics and shipping providers believe the lack of supply chain visibility is one of their biggest challenges.[5] Oversight is critical, but knowing what's happening requires consistent, cost-effective workflow insights. Transportation management systems provide essential visibility while helping companies manage tracking and customer service more effectively.

UniGroup, for example, recently debuted a new agent transportation management system (TMS) to improve real-time and all-mile insights.[6] The platform delivers efficiencies in the form of:

- Immediate order updates
- Track and trace abilities
- Electronic logging devices
- Mobile app usage
- Interconnected partner systems

Without fast, reliable connectivity and increased data transmission capacity, even the best laid coordination and delivery plans fall flat. Powering an effective TMS requires connectivity to match.

[5] https://www.dhl.com/discover/business/productivity/5g-and-logistics
[6] https://www.prnewswire.com/news-releases/unigroup-debuts-all-new-logistics-platform-301309101.html

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New Levels Of Fleet Awareness.

Leaders in the space know the importance of systems that seamlessly connect data inputs. Gartner found that 46% of T&L organizations say supply chain visibility is their top-funded investment initiative.[7]

Within fleets, organizations like FedEx rely on telemetry to collect information on:

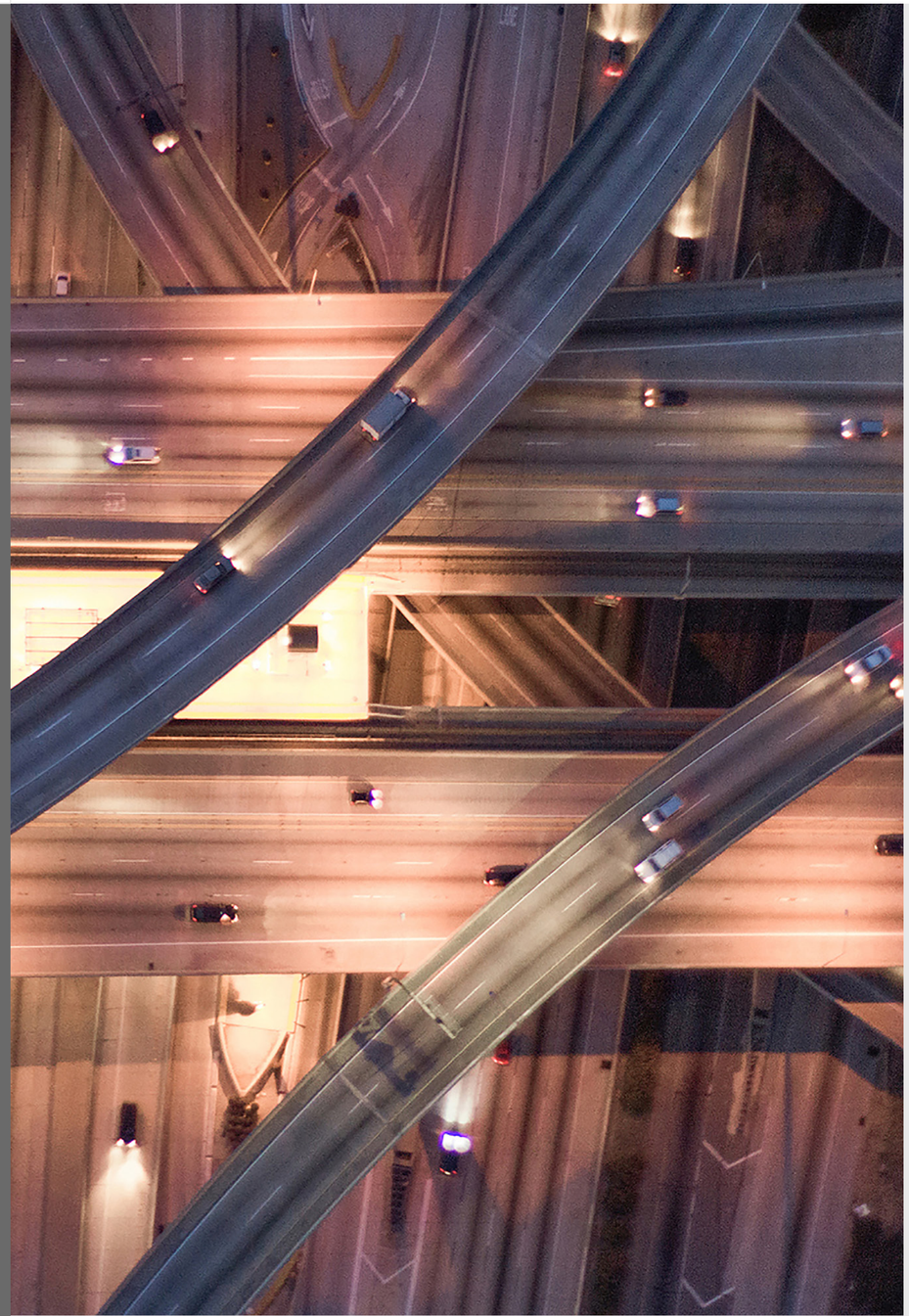
- Vehicle routes
- Fuel levels
- Current locations
- Engine idling
- Delivery status

The goal? To monitor vehicles and drivers, mitigating risk today and in the future. On similar routes and situations, historical trends help predict future outcomes, equipping everyone with the right information at the right times.

Today, major players already utilize 4G connectivity to power visibility solutions. The 5G rollout will undoubtedly enhance these processes.

> **"The application of real-time analytics to the sensor-collected data improves visibility into the transportation network, automatically predicts the flow of shipments, and optimizes delivery routes by dynamically routing shipments to bypass network clog points."**
>
> — **CIO Dive**[8]

[7] https://www.gartner.com/document/3894274
[8] https://www.ciodive.com/news/fedex-cio-rob-carter-digital-transformation/586709/



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5G's Ultra-Low Latency And Coverage Boosts Monitoring And Powers New Solutions For Improved Fleet Visibility.

Faster speeds and broad coverage are the key to fleet-wide communication: critical exchanges between drivers/aircrews, dispatch, managers, operators, and customers. This is where many T&L companies rely on 4G. The question in decision-makers' minds might be: why move to 5G when we've solved for connectivity today?

The first benefit is simple: 5G speeds. With data transfer on 5G, organizations deliver telematics and fleet management software insights to workers faster. The next benefit is all about capacity. With 5G, businesses can pull CRM data, historical business trends, news, weather, and more—feeding it into advanced AI-powered applications. From there, the possibilities are nearly endless.

The Dawn Of AI In T&L.

AI and machine learning systems support predictive maintenance (for full truck analysis, including potential failures and scheduled repairs), shipping volume predictions, and route optimization—providing visibility to problems preemptively. These systems are starting to maximize revenue for companies as well. Purolator, for example, is using AI for sales modeling with more accurate predictions and prescriptive analytics for real-time coaching. The process has led to a win rate increase and top-line revenue growth.[9] 5G's high-speed data transfer, when paired with everything from computer vision to AI, improves connectivity, collaboration, and responsiveness in more ways than one.

[9] https://www.forbes.com/sites/cindygordon/2021/09/05/the-rise-of-ai-in-the-transportation-and-logistics-industry/?sh=193b3fea7869

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Bringing Real-Time Insights Together With 5G.

By 2023, 50% of global product-centric enterprises will have invested in real-time transportation visibility platforms. The market is thriving, with several vendors growing at 100% year over year.[10]

As 5G matures, T&L companies can benefit from ultra-low latency, connecting fleet management dashboards between business segments, drivers, and partners—including port networks and intermodal transport workflows.

With more accurate data on temperature, humidity, g-force (or gravitational acceleration), altitude, location, and more, operators and managers can deliver instantaneous insights to improve performance and outcomes.

[10] https://www.ibm.com/downloads/cas/YLEKOE53

Optimizing Performance

Connected Logistics Infrastructure And Devices Help To Streamline Operations. With Automation, The Benefits Will Only Increase.

NOW

Connectivity Helps T&L Organizations Turn Data Into Actionable Insights.

Today's industry leaders rely on both 4G and 5G to power their fleet and transportation management solutions. In addition to enhanced visibility through live status updates and forecasts, these solutions help companies adjust their workflows and remove process bottlenecks.

With a driver-facing mobile application, for example, businesses can pivot through new inputs and obstacles—whether it's traffic conditions or end-point appointment changes.

Similarly, supply chains can use end-to-end platforms for auditing systems and processes, such as order fulfillment and intake, to perform more efficiently.

One IBM report highlights a well-known fact in T&L: shipping overpayments are often attributable to high-volume, global shipping operations with too much data for manual processes to absorb.[11]

With a 5G network capable of handling all the data, companies can invest in tools that heighten accuracy and provide key checks and balances between financial teams and customers.

Some estimates indicate that one-quarter of all freight bills have an error that can impact a company's bottom line profits.[12]

[11] https://www.logisticsmgmt.com/images/site/ZZW03092USEN.pdf
[12] https://www.redwoodlogistics.com/what-are-trends-in-automation-of-freight-audit-payments/

> **“We need the data and automation within the entire ecosystem. I think this is a key element—how we can share data. The amount of double work, manual double work, our industry does is insane. These are man-hours we can save by sharing data.”**
>
> **— GlobeAir**[13]

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Overcoming Driver Shortages.

Fleet management solutions are addressing one of the long-standing problems plaguing T&L: driver shortages. In the years before COVID-19, the industry was short nearly 61,000 drivers, according to the American Trucking Association.

The association estimates a shortage of 160,000 drivers by 2028.[14] In a high-risk, sometimes isolated profession, fleet management promotes better employee experiences and overall workforce retention with:[15]

- Safer, less stressful environments
- Timely feedback and incentives
- Activity prioritization and management

[13] https://www.ainonline.com/aviation-news/business-aviation/2021-05-20/automation-helpful-flight-ops-needs-improvement
[14] https://www.trucking.org/sites/default/files/2020-01/ATAs%20Driver%20Shortage%20Report%202019%20with%20cover.pdf
[15] https://blog.fleetcomplete.com/how-fleet-management-technology-improves-driver-retention

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As Technologies Advance Alongside 5G Networks, Companies Will Leverage More Data To Accelerate Speed-To-Value In Their Investments.

5G powers the immediate visibility companies need to optimize operational performance. With real-time data on vehicles, roads, and the environment, it's easy for fleets to make quick changes that help drivers and deliveries stay on schedule.

A big part of optimizing performance starts with mitigating risk to keep the ecosystem moving. When paired with remote diagnostics, telematics, and 5G, AI is poised to enhance predictive vehicle maintenance, reducing stress on maintenance teams and drivers.

Performance Meets Sustainability

One company recently reported a 90% decrease in CO^2 emissions with electrical transport over a 1.5-year period, while matching the cost of diesel.[16]

5G will also unlock more power under vehicle hoods with on-demand software flashing to ensure that vehicles are using the latest factory updates and operating efficiently. Flashing requires massive data processing in a short period of time but is a quick and inexpensive way to boost efficiency for drivers.

Fleet Electrification.

The cost of electric vehicle batteries has declined by around 80% in the last eight years, and further reductions are expected over the next decade.[17] With lower operational costs associated with fuel, maintenance, and uptime performance (one electric fleet chassis provider estimates 98%), investment returns will improve year over year.[18]

It's becoming clear that full electrification is possible for large T&L companies. With all the potential, integrated systems are critical to reaping the benefits associated with electric fleets, ensuring:[19]

- Minimized and predictable charge times
- Performance reliability
- New electric supply processes between facility property owners, leasing companies, and other service providers

[16] https://www.forbes.com/sites/edgarsten/2021/11/03/einride-opens-in-the-us-creates-first-remote-truck-driver-job/?sh=37543e50290a
[17] https://www.ceres.org/sites/default/files/reports/2020-05/The%20Road%20to%20Fleet%20Electrification.pdf
[18] https://www.motivps.com/8-key-considerations-when-electrifying-your-fleet/
[19] https://www.ceres.org/sites/default/files/reports/2020-05/The%20Road%20to%20Fleet%20Electrification.pdf

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A Remote Revolution With Autonomous Fleets.

Fully autonomous fleets have the potential to reduce costs and improve productivity. Powered at scale by 5G data capacity and speeds, self-driving trucks, for example, will increase fleet productivity and system capacity, operating nearly 24/7 without hours of service (HOS) restrictions. This kind of automation could double a single truck's daily range from 600 to 1,200 miles.[20]

Autonomous fleets help address driver shortages, and they also create opportunities for companies to attract, upskill, and retain great talent. The role of "truck driver" will soon give way to the emergence of "remote operator." Though driver skills will remain in demand, companies are looking closer at the next generation of T&L—and how autonomous fleets can help.[21]

[20] https://www2.deloitte.com/us/en/insights/focus/future-of-mobility/autonomous-trucks-lead-the-way.html
[21] https://www.einride.tech/insights/remote-operation-and-the-future-of-trucking

Improving Safety

In T&L, Drivers, Delivery Workers, And Others Constantly Interact With The Public. Safety Is A Top Priority.

> **"With the continuing evolution of technology, road safety professionals must become fluent with the ever-changing advanced safety features and technology aids in the fleet industry, and use them to advance road safety efforts."**
>
> — **GeoTab**[22]

NOW

5G-Fueled Analytics Correct Route And Vehicle Issues, Protecting Drivers And The Public Before Accidents Occur.

T&L is on the path to digital transformation, but there's no denying it can be a dangerous business. Latest figures from the U.S. Bureau of Labor Statistics show 805 fatal work injuries occurred in the transportation and warehousing sector in one year—the second highest of all sectors listed.[23]

Injuries and fatalities on the job hurt drivers, their families, and the public at large. They also carry a high cost for companies:[24]

- Cost of average crash: $16,500
- Cost of crash resulting in an injury: $74,000
- Cost of crash where a fatality occurs: more than $500,000

42% of organizations have seen fewer safety incidents since using fleet-tracking software to monitor drivers.[25]

[22] https://www.geotab.com/blog/ups-telematics/
[23] https://www.bls.gov/charts/census-of-fatal-occupational-injuries/number-and-rate-of-fatal-work-injuries-by-industry.htm
[24] https://www.bls.gov/charts/census-of-fatal-occupational-injuries/number-and-rate-of-fatal-work-injuries-by-industry.htm
[25] https://www.teletracnavman.com/resources/blog/9-must-know-stats-on-the-state-of-fleet-management

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Acting On Insights To Improve On-Road Safety.

In T&L, safety leads to greater productivity, and that requires acting on data insights. For example, increasing reaction speeds to potential hazards in moving traffic will mitigate operational downtime due to unexpected repair.

How do you increase reaction speeds? With systems that gather data and elevate recommendations and warnings directly to drivers. T&L organizations are deploying safety features such as:

- Left-hand turn assist
- Enhanced forward-collision detection
- Blind spot warnings
- Intersection movement assistance

Even with the best software in place, safety is ultimately in the hands of the driver. Nationally, auto insurance premiums have increased 16% since 2011, correlating with the increase in distractions while driving.[26] Industry leaders are deploying solutions to detect distracted driving behaviors, such as the duration and activity-levels of smartphone use. The data is then shown to the driver, teaching them how to minimize bad driving habits that result in serious accidents.

[26] https://content.naic.org/cipr_topics/topic_distracted_driving.htm

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Emerging Safety Solutions Require Networks That Can Handle Massive Amounts Of Data Through Connected Systems And Sensors.

Of the many ways 5G technologies are projected to transform T&L, enhanced driver safety and collision prevention may be the most significant. One of the main KPIs for fleets is vehicle availability.

Accidents create extended vehicle downtime, cutting the number of usable vehicles. Daily safety routines contribute to vehicle availability, ensuring that all vehicles in a fleet ecosystem can operate harmoniously.

Lower latency and increased capacity with 5G will unlock new ways to protect drivers and assets:

- **Machine learning** for driver facial authentication, real-time micro traffic and weather modeling, changes in the landscape, and more
- **Augmented reality (AR)** to present overlays with supplemental information like indicators for close vehicles
- **Driver video safety** enabled by telematics to prevent collisions and automatically call emergency services in the event of an accident[27]
- **Robots** to handle loading/unloading and transportation of dangerous goods

[27] https://www.teletracnavman.com/resources/blog/9-must-know-stats-on-the-state-of-fleet-management
[28] https://www.cleantech.com/intelligent-traffic-systems-and-v2x-communication-if-cars-could-talk/

Connected vehicle technologies can reduce the severity of non-impaired crashes by 80%, save $3.6 billion in collision costs, and reduce traffic by 25%.[28]

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Making Roads Safer For Vulnerable Road Users.

Some estimates indicate that driver visibility is related to over one-third of truck crashes involving vulnerable road users (VRUs)—pedestrians, cyclists, motorcyclists, and others.

Global NGO Together for Safer Roads and behavior AI company Humanizing Autonomy recently teamed up to improve driver visibility and reaction times with a greater understanding of VRU behavior. Layered with vehicle awareness and safety, this kind of technology enhances systems with a detailed understanding of how people around the vehicle might behave.[29]

Processes and technologies that safeguard employees, VRUs, and on-board cargo improve fleet uptime, cost control, and vehicle lifespans. And with any system that's handling large amounts of real-time data, the right connectivity is critical. High-bandwidth, ultra-low latency 5G will protect drivers and save lives as safety features expand.

[29] https://www.businesswire.com/news/home/20210614005170/en/Together-for-Safer-Roads-Chooses-Humanising-Autonomy-for-Safer-Roads-Studio-Truck-of-the-Future-Initiative

Reducing Costs

Both 4G And 5G Networks Facilitate Efficiencies Across T&L Organizations. Future Innovation Could Change How The Whole Ecosystem Operates.

NOW

Next-Generation Connectivity Creates New Ways Of Working—Optimizing Employee Time And Streamlining Operations.

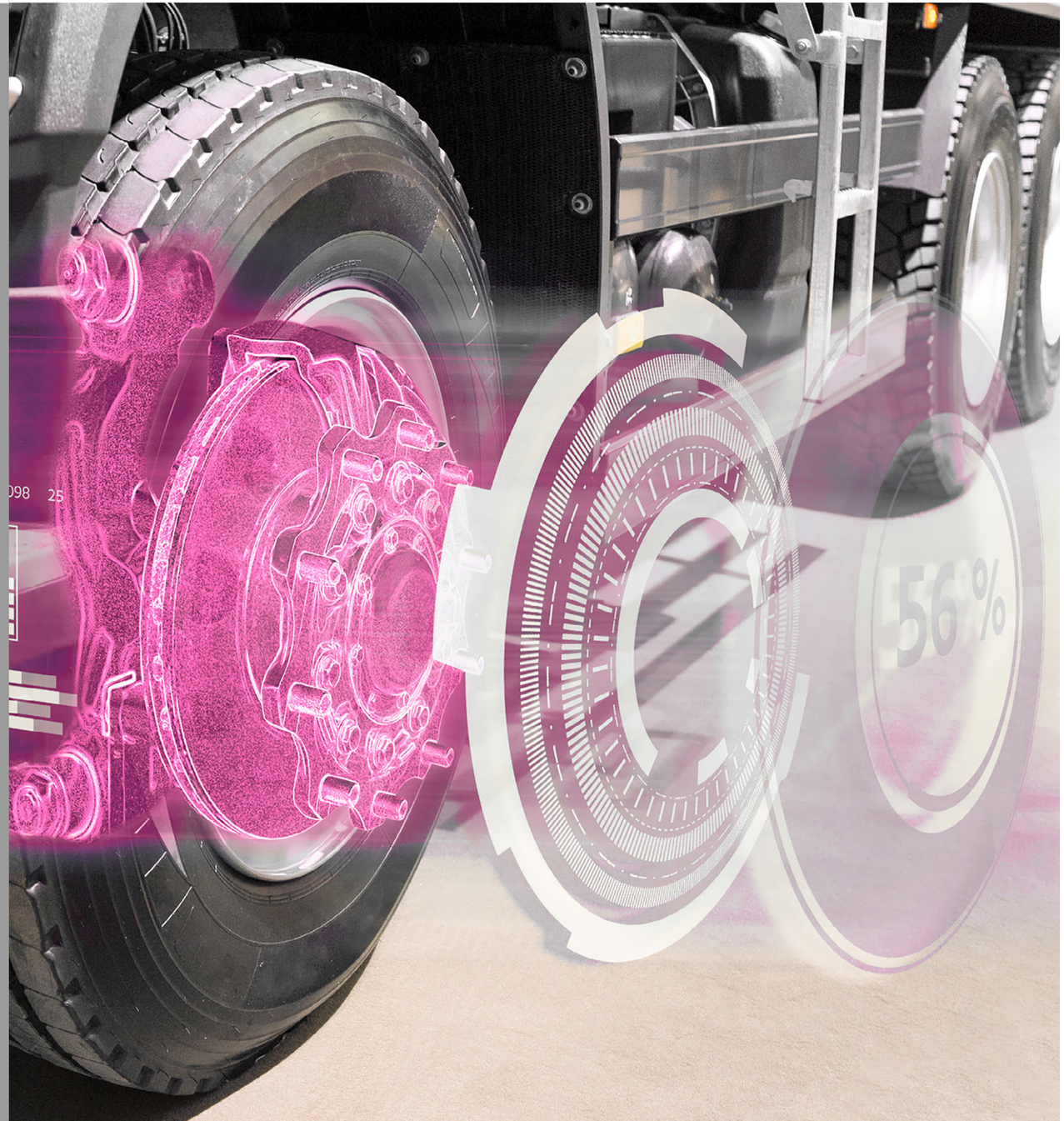
Today, organizations use tracking and fleet management platforms to monitor high-value assets and vehicles.

5G and IoT have revolutionized the sector with connected devices that not only track real-time location but also the condition of shipments, pallets, and individual goods throughout the entire supply chain—on demand.[30]

4G- or 5G-enabled visibility solutions like fleet management and end-to-end supply chain visibility platforms ensure that tasks on the road or warehouse floors are completed to avoid rework. With input-output expanders (IOX), operators can monitor individual parts of vehicles, such as tire pressure sensors.

These devices provide component-level insights about problems like underinflated tires—insights that lead to improved driver safety and increased vehicle fuel efficiency by up to 15%.[31]

[30] https://www.scmr.com/article/5g_and_the_logistics_industry_what_the_future_holds
[31] https://www.chevinfleet.com/en-us/learning-zone/how-to-reduce-your-fleet-management-costs/



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Smarter Workflows With AR Technology.

Augmented reality devices on 5G speed repair processes and worker accuracy. For example, remote teams using hands-free AR glasses can leverage software to display visual instructions for maintenance and repairs in real time.

In a recent pilot project, DHL explored smart picking with worker AR glasses—showing computerized picking records in their field of vision and recommendations for shelving. The results were astonishing:[32]

- 15% productivity improvement
- 40% mistake reduction
- 25% increase in picking efficiency
- 50% faster training time

Asset protection is yet another goal powered by 5G. Many organizations use smart cameras and drones to survey facilities, with smart video analytics to detect intruders, left-behind objects, and suspicious patterns. If the system spots an issue, designated responders receive an immediate alert.

[32] https://tbtech.co/news/how-augmented-reality-can-improve-efficiency-in-transportation/

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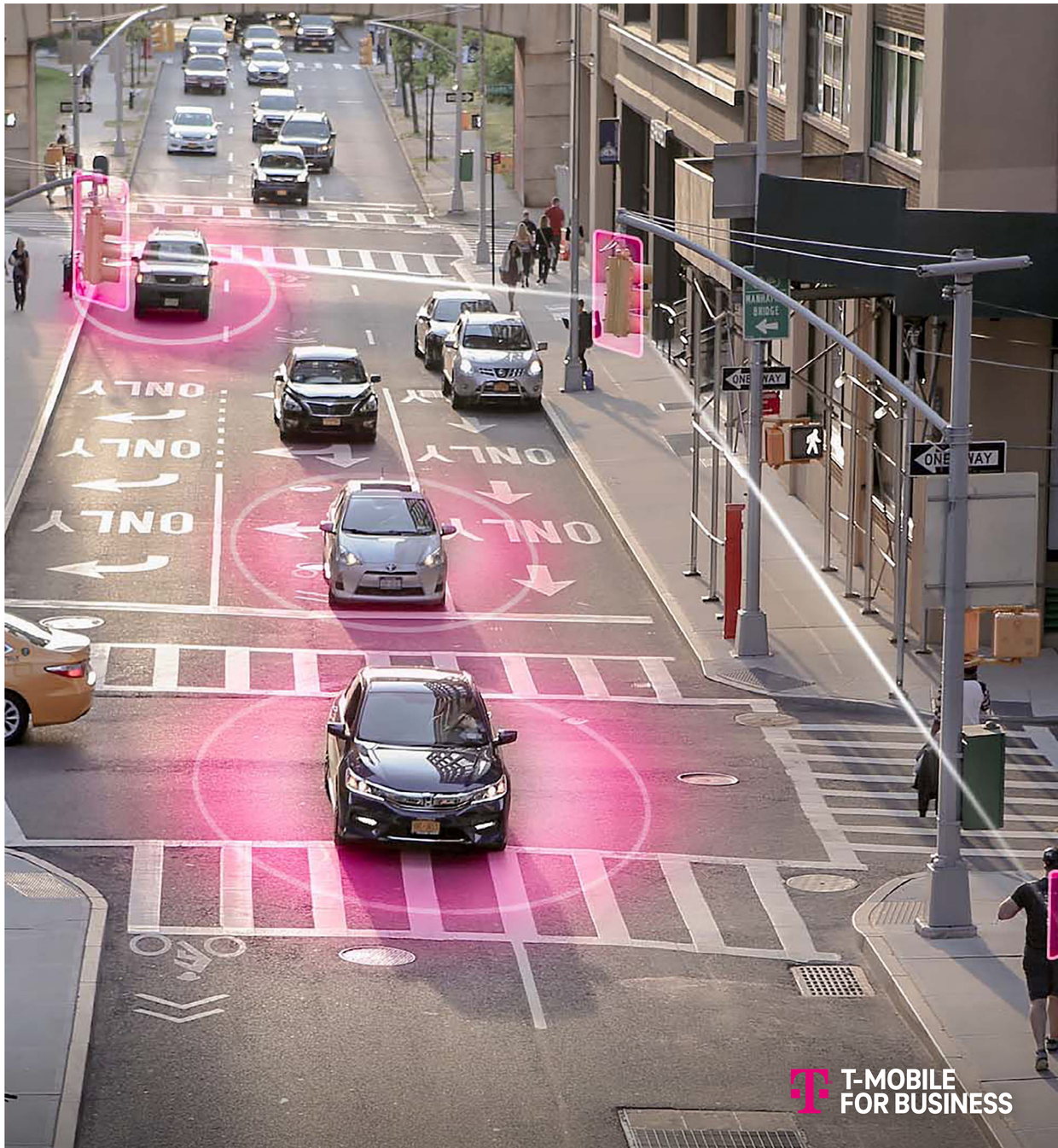
The Rollout Of 5G Networks Will Soon Support Massive IoT And Smart Cities.

Imagine entire fleets of trucks delivering packages across the nation with a single operator. Or humans handing off fulfillment and inventory management to robots—ensuring service around the clock and negligible error frequency. These are just a few possibilities, and they're emerging as we speak.

5G is also creating new infrastructure possibilities. Cellular vehicle-to-everything (C-V2X) is on the horizon. Roads will be safer—and greener—than ever before. For instance, 5G could allow autonomous semis to travel close together over long distances in platoons, reducing drag and fuel consumption. As these initiatives evolve, they'll increase flexibility and control for shippers and carriers behind the wheel and back at HQ. As an added benefit, those decisions will improve safety and lower maintenance costs.

Connected traffic management could lead to a 30% reduction in idling at intersections.[33]



[33] https://www.accenture.com/_acnmedia/PDF-146/Accenture-5G-WP-US.pdf

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Revenue savings trickle down to assets, too. In warehouses, organizations can use 5G data transfer capabilities to take asset tracking to the next level with single-item, SKU-level tagging and tracking.

These systems can track every RFID-tagged piece of merchandise from the point of manufacturing to the store. With this SKU-level visibility, retailers can more effectively and immediately track low or out of stock items and place orders for transportation carriers for more efficient delivery and restocking.

With this SKU-level visibility, retailers and T&L companies can avoid inventory management and larger supply chain problems with:

- Precise inventory forecasting
- More accurate picking and packaging
- Distribution and sales within shelf-life windows
- Lower carrying costs with real-time information on product availability and associated routes

T-Mobile For Business: Innovation Through Partnership

Forging Ahead With America's Largest And Fastest 5G Network.

With increased capacity and faster speeds to support everything from driver safety solutions with AI to fully autonomous fleets, next-generation connectivity is poised to take T&L to new frontiers of service. Critically, 5G will be the platform for an ever-growing number of devices, systems, and vehicles, whether they're on a warehouse floor or delivering goods on the road.

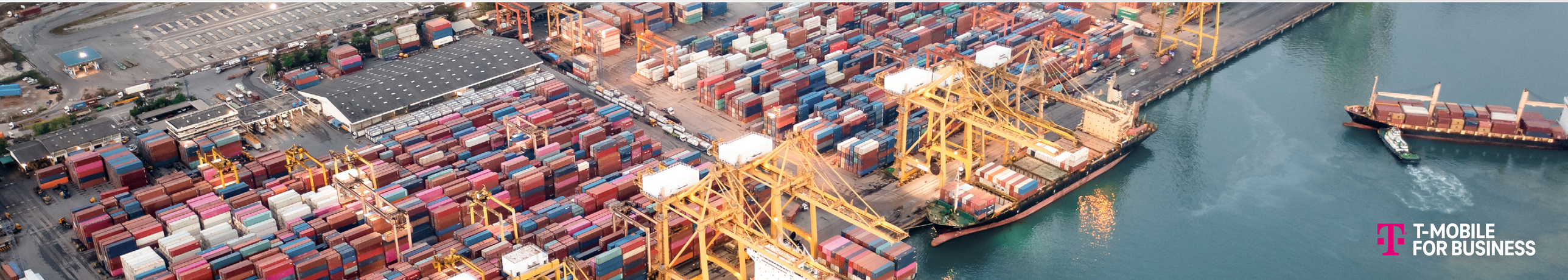
To exceed customer expectations, control costs, and deliver on the promise of supply chain innovation, T&L organizations need a connectivity partner—one that understands industry challenges and possibilities. The right 5G partner can help your teams:

- Be agile, helping every person in your ecosystem navigate the demands of a rapidly changing world
- Identify near- and long-term technology investments
- Digitize traditionally manual communications workflows

T-Mobile for Business is here to offer your organization the latest devices and services to support digital transformation efforts.

But more than that, we're here for the partnership—every project starts with understanding specific connectivity challenges, team dynamics, and business goals. It's what helps us build solutions tailored to organizations while pushing the envelope on industry-wide innovation.

T-Mobile is America's Largest 5G network & Fastest median, overall combined 5G speeds according to analysis by Ookla® of Speedtest Intelligence® data 5G download speeds for Q4 2021. Capable device required; coverage not available in some areas. Some uses may require certain plan or feature; see T-Mobile.com.



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Ready To Find Out How T-Mobile For Business Can Support Your Business Goals?

Learn More Today.