



# DELIVERING ON THE PROMISE OF DELIVERY: PREVENTING FUTURE AUTO SUPPLY CHAIN DISRUPTIONS

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## PART 1 | IMPACT AND ROOT CAUSES





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With **recent disruptions** critically impacting the automotive supply chain and costing manufacturers millions in lost production and sales, it is clear that supply delivery issues now need the same level of attention as vehicle safety and quality. What is really at the root of ongoing delivery performance issues, and how can automotive OEMs and suppliers overcome these systemic deficiencies to avert industry-wide disaster?



### **ANXIETIES OVER LATE DELIVERIES**

Automotive vehicle quality and safety improved dramatically over the last three decades as OEMs and suppliers implemented process-focus in their operations and adopted **advanced technologies** for design and production. These positive advances, though, are threatened by a global supply chain struggling with supplier delivery issues that delay vehicle launches and cost millions of dollars in lost sales opportunities.

**And it will only get worse without industry-wide action.**

Supplier delivery performance, already susceptible to many internal and external disruptions, faces increased pressures rippling back from an accelerating pace of new vehicle technologies and rapid shifts in consumer demands. The automotive supply chain

must be strengthened to ensure back-end supply chain processes become disruption-proof while aligning to support new vehicle buying behaviors.

OEMs and industry groups must lead the way. Supply chain resilience and supplier delivery performance require the same commitment to industry standards, education, training and incentives that drove quality and safety gains.

Suppliers must confront their shortcomings in delivery performance and consider process and technology improvements for competitive advantage, just as they embraced continuous improvement around quality and safety expectations.

This paper examines the impact disruptions have on the automotive supply chain, identifies the systemic

root causes of chronic delivery performance issues and introduces a roadmap for sustainably improving delivery performance.

### **THE FRAGILE AUTOMOTIVE SUPPLY CHAIN**

Internal and external disruptions, both severe and mild, constantly pressure the automotive supply chain and cause unanticipated reductions or stoppages of vehicle production. Internal disruptions include part quality issues, recalls and supplier financial instability; and external disruptions include fluctuating vehicle demand, shifting trade policies and tariffs, natural disasters and unexpected global resource shortages. A seemingly unending wave of these “trigger” events exposed the fragility of the global automotive supply chain with alarming regularity (see sidebar, next page).

# DISRUPTION, RECOVERY, REPEAT

## 2020-2021 Global semiconductor shortage

Surging demand for consumer electronics causes severe semiconductor shortage, forcing automakers to reduce or idle vehicle production.

## 2020-2021 COVID-19 pandemic

Extreme disruption to all walks of life stressed every level of the auto supply chain, from the smallest sub-suppliers to the largest OEMs to retail dealerships. A slow, inconsistent restart followed a rolling, global industry shutdown.

## 2018 U.S. magnesium die-casting plant fire

Accident led to production disruptions at several OEMs and caused Ford to shut down production of its best-selling F-150 truck.

## 2012 Germany chemical plant explosion and fire

Accident created a global shortage of a key plastic resin used in braking and fuel system components. An industry task force had to be quickly assembled to expedite qualification of alternative materials.

## 2011 Japan earthquake and tsunami

Natural disaster quickly demonstrated how an isolated disruption of a single key supplier could ripple around the world. Shutdown of specialty pigment plant forced Ford, Chrysler and other OEMs to suspend sales of vehicles in certain colors.

## 2007-2009 Great Recession

Financial markets collapsed and resulting loss of vehicle sales crippled the industry. In 2009, 27 automakers filed for Chapter 11 bankruptcy, with GM and Chrysler among OEMs requiring government assistance to stay in business.



Even before the COVID-19 pandemic, OEMs struggled with supplier delivery issues, as evidenced by poor supplier delivery performance ratings on supplier scorecards. Ongoing supplier performance issues prompted the International Automotive Task Force (IATF), in conjunction with several OEMs, to pilot the IATF Red Supplier status program in mid-2019. This program seeks to correlate Tier 1 supplier performance as experienced by OEMs with the supplier's Quality Management System certification status to IATF 16949 (the global automotive industry QMS standard). Notably, Tier 1 suppliers are identified as “red status” just as often for delivery issues as for quality concerns.

Supplier delivery performance risks were identified in a 2019 OESA Supplier Barometer study in which over half of the supplier concern scenarios were directly related to supply chain topics such as capacity and logistics constraints and raw material shortages.

Service parts delivery delays have also been an ongoing problem for the automotive supply chain. With the average age of vehicles currently on the road in the U.S. closing in on 12 years, the demand

for service parts is increasing. OEMs continually experience backlog status for service parts from suppliers, leading to consumer dissatisfaction when vehicle service repairs take weeks rather than hours to complete. Unfortunately, the priority for many automotive suppliers is series production part deliveries to their OEM customers. Additionally, service parts planning and management processes tend to be less mature to non-existent at most automotive suppliers.

### **These issues highlight critical areas of concern for manufacturers up and down the supply chain:**

1. The financial instability of suppliers impacted by an unanticipated protracted production disruption
2. Uncertainty of suppliers' ability to restart operations and recover production levels based on unpredictable and fluctuating vehicle demand
3. Accuracy and timeliness in communication of supply requirements from OEMs throughout the supply chain
4. The availability of reliable transportation networks for parts and vehicles
5. Understating potential risk and lack of resilience in the supply chain in the face of future disruptions



## HIGH(ER) COSTS OF SUPPLY CHAIN DYSFUNCTION

With 57% of vehicle value attributable to raw materials and supplied components, and automotive supply chain costs ranging from 9% to 14% of revenues, supply chain disruptions can be devastating. McKinsey found that, on average over a decade, supply-chain-disruption losses equal 56% of one year's earnings of a typical auto manufacturer -- in effect forfeiting more than 5% of earnings each decade. Beyond disruptions, accumulated inefficiencies and poor visibility across the supply chain add up to significant operating losses and damaged customer experiences. For many customers this can mean millions of dollars in lost revenue and non-productive labor costs.

Some automotive manufacturers have revisited their inventory management and sourcing philosophies, and instituted more transparent supply chain tracking

mechanisms as a result of recent supply chain disruptions. These measures, though, have not been adopted consistently across the automotive supply chain.

This needs to happen because, otherwise, it all could get much, much worse.

## FROM FRAGILE TO ...?

On top of everything else, COVID-19 ushered in dramatic supply and demand shifts that could upend the automotive industry.

The pandemic's impact extended all the way to retail dealerships, where an unanticipated, rapid rebound in vehicle demand left empty spaces in previously full lots. Consumers, 92% of whom already research online ahead of dealer visits, shifted to buying vehicles online.

In a competitive marketplace increasingly driven by e-commerce, customer expectations have risen.

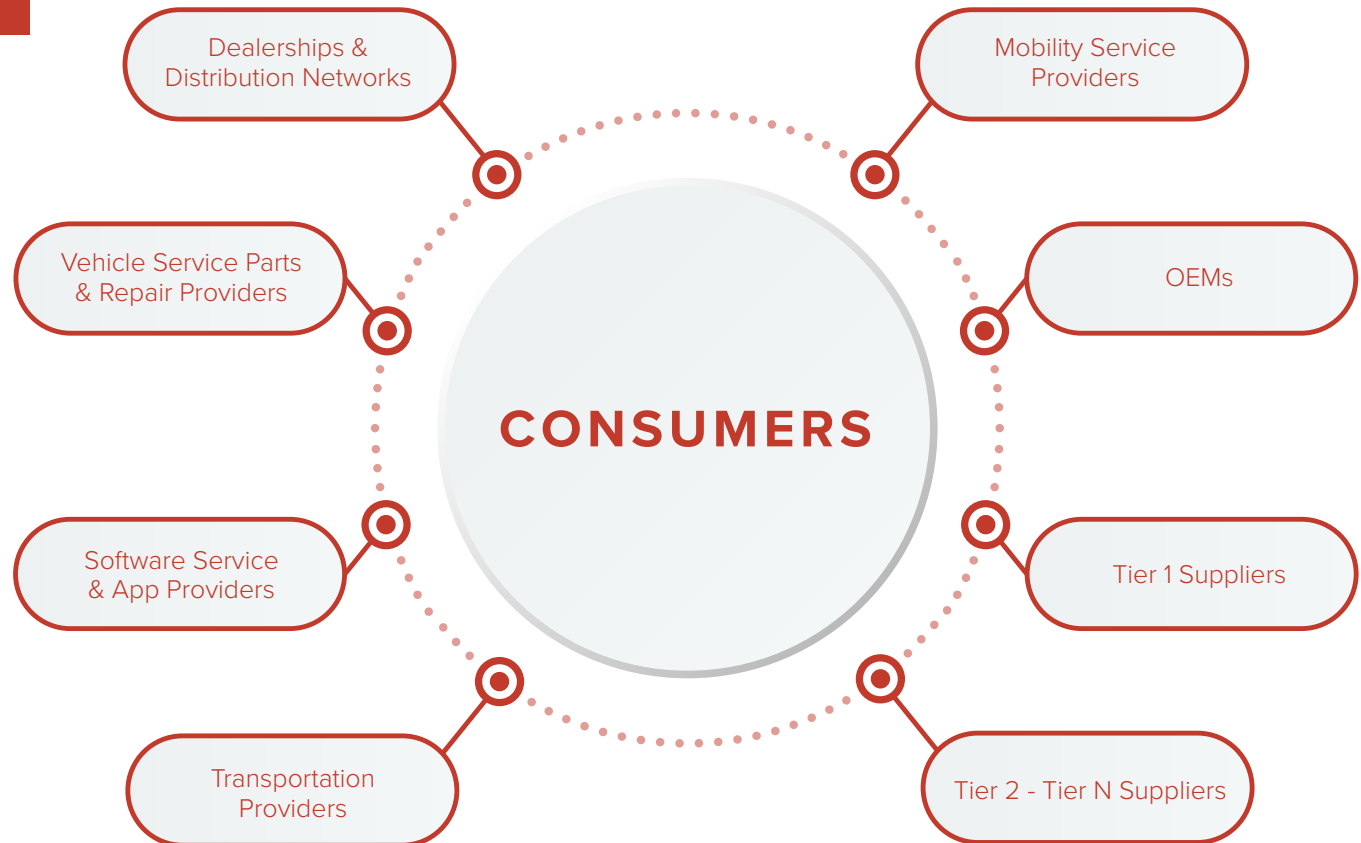
The "Amazon Effect" has trained buyers to demand and expect their exact trim levels, styles, options, packages and accessories, as well as how and when their vehicle will be delivered to them. With little patience and plenty of options, these online buyers won't tolerate delayed shipments and will quickly search out another seller or brand.

And while **how** vehicles are bought impacts the global supply chain, **what** vehicles are bought will have an even bigger impact on the relationships between OEMs and suppliers. The transition now underway to Autonomous Connected Electric Shared (ACES) vehicles is completely transforming the way vehicles are designed, sourced, produced, sold and utilized.

This puts enormous pressure on the supply chain, as the number and types of parts, components and systems continuously change. For instance, into 2021, the automotive industry now competes head-on with gaming systems, personal computers, 'smart' appliances and other automated, connected and shared consumer products for semiconductors -- just as the COVID-19 slowdown and chipmaker consolidation curtailed overall supply.

These momentous shifts -- coupled with increasing and compounding disruptions -- wreak havoc up and down the supply chain. Natural disasters, raw materials shortages and fluctuating consumer demands won't go away. A shifting base of new, diverse suppliers (e.g., developers of and sub-suppliers to future energy sources) will bring even more chaos without systemic improvements.

# AUTOMOTIVE SUPPLY ECOSYSTEM



## Future automotive supply chain includes:

- Vehicles
- Parts
- Software
- Information / Data

With the auto industry's evolving shift from vehicle producers to mobility service providers, its supply chain's definition and scope is also transforming. In fact the term "supply chain" may no longer be an accurate representation of the myriad processes required to deliver "the right product in the right place at the right time." Mike Dickinson, Director of Material Planning and Logistics of Group Lotus, suggests a more appropriate term -- "Supply Ecosystem" -- to

describe the interlocking relationships among a growing number and variety of stakeholders. The Automotive Supply Ecosystem goes beyond parts suppliers to also include software providers, logistics partners, IT, value-add facilities, vehicle subscription services, etc. To succeed in this evolving marketplace, manufacturers must transform linear supply chains into autonomous supply chain ecosystems.

Automotive manufacturers must refocus their operations from manufacturing-centric to supply chain-focused in order to maintain continuity in the face of relentless disruptions.

**“ This [global pandemic] disruption begs the question of sustainability in our supply chains due to the industry’s global nature and economies of scale. With the increasing impact of natural disasters and disease, this should be studied from a business strategy and risk management perspective. Similarly, the push for electrification will put other and new raw materials and commodities in jeopardy that haven’t been a large part of the past portfolio. These potential strains need to be thought about and plans put in place now.”**

**– Carla Bailo,**

President and CEO, Center for Automotive Research

**To avert disaster, the industry must shed the status quo of only monitoring the proximate supply sources and find ways to improve delivery performance:**

- from OEMs to consumers based on the emerging online sales model,
- via more accurate and timely forecast information provided to suppliers, and
- by suppliers evaluating and confirming material/parts availability throughout the supply chain, even to raw materials sources.

## SYSTEMIC ROOT CAUSES OF POOR DELIVERY

How does the industry improve delivery performance? By confronting three primary systemic root causes that demand industry-wide attention and response:

### 1. Lack of Supply Chain Process Standards

Essential supply chain processes have not been consistently identified nor have supply chain management consensus requirements been adopted across the automotive industry. Supply chain-related processes traditionally have been viewed as non-value added activities in manufacturing operations, and therefore tend not to be a focus for standardization and improvement efforts.

In many automotive manufacturers, quality and supply chain functions tend to operate as silos. This leads to suboptimal results for the organization as well as the overall automotive supply chain. As an example, when an OEM issues a complaint regarding parts delivery performance, that complaint typically lands in the supplier’s quality function, which often does not have the necessary competencies to lead investigations into supply chain issues. If or when the complaint passes to the supply chain function, a lack of well-defined supply chain processes and related problem-solving expertise prevents systemic corrective action investigations. As a result, many supplier delivery performance issues are addressed with an ad hoc “find it, fix it” problem-solving approach, which does not lead to identification of systemic root cause and implementation of sustainable system solutions. Thus delivery performance issues continually repeat.



A key advantage of establishing and adopting industry-wide standards is the integration of essential processes within organizations’ operating systems. Implementation of and certification to ISO 9001/IATF 16949 QMS standards embedded quality processes throughout automotive manufacturers’ businesses, leading to improved quality outcomes. The same should be considered for management of supply chain processes.

### 2. Lack of Supply Chain Competency Tools & Training

A significant competency gap exists across the automotive industry related to supply chain issues. Accumulated knowledge has been lost over the past two decades due to retirements and workforce reductions, as well as diminishing interest among younger generations in pursuing automotive careers.

This critical loss of knowledge, especially related to supply chain management, prevents stabilization and improvement of key operational activities and hinders development of the next generation of automotive supply chain professionals. The supply chain management

competency gap also extends to third-party IATF 16949 QMS auditors, who are responsible for assessing the effectiveness of actions taken by automotive suppliers in addressing delivery performance issues as part of overall QMS effectiveness.

While progress has been made, and the issue has been identified, the availability of foundational supply chain management knowledge and competency development tools lags behind what is already available for quality and manufacturing topics (e.g., AIAG Automotive Core Tools). And while several university-led certificate and degree level automotive supply chain programs are available today, filling the existing gap with these educational programs would take decades.

Without the clear identification and consistent definition of essential supply chain processes, determining and developing the necessary competencies to ensure successful business outcomes is not possible. The industry must fix this, and develop the tools and training to rapidly close the supply chain management knowledge and competency gap.

### **3. Low Adoption of Automation & Advanced Technologies**

Applications of automated supply chain processes

and advanced technologies have not been adopted as a standard throughout the industry. Automotive manufacturers tend to apply their focus and investments on core manufacturing processes.

This is a critical oversight as the industry shifts toward a consumer-driven model where value-add is defined as “the right product in the right place at the right time,” making supply chain processes essential for business success. Efforts to automate supply chain processes often lead to a patchwork of disconnected systems -- within manufacturing enterprises as well as between suppliers and customers. This incremental automation only accomplishes isolated pieces of supply chain activities, requiring manufacturers to utilize manual tools, such as Excel spreadsheets, to transfer information from one system to another and translate data for decision-making.

Additionally, most automation applications do not achieve integration of information across an enterprise’s functional units, in particular the interface between quality and supply chain processes. Supplier delivery performance is often directly correlated to product quality and operational performance issues; this relationship is often missed when supply chain processes are managed separately from quality and manufacturing operations.

**“*Connected systems are absolutely fundamental and we are trying to put them front and center of the digital strategy for logistics as part of our overall commercial transformation. The problem for those in the carmakers’ logistics departments, however, is they are often left with the scraps.*”**

**– Martin Corner,**

VP of Supply Chain Logistics at Volvo Car

By adopting a digital-first approach to managing supply chain processes, automotive suppliers must replace slow, costly, reactive and error-prone manual processes with faster, more efficient, predictive and accurate automated processes that provide real-time data and greater supply chain visibility.

To achieve immediate and continuous improvements in supplier delivery performance -- and align the automotive supply chain with a consumer-focused present and future -- these three systemic root causes must be addressed by the industry as a whole, as well as through changes to systems and structures within each automotive supplier.

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# ROADMAP TO IMPROVING AUTOMOTIVE SUPPLY CHAIN PERFORMANCE



## ROADMAP FOR IMPROVING THE AUTOMOTIVE SUPPLY CHAIN

The need to address and remedy the key systemic root causes of poor supply chain delivery performance is an urgent priority for the automotive industry. Toward that goal, a proposed five-step roadmap for improvement includes:

1. Identifying essential automotive supply chain processes
2. Assessing current supply chain competencies based on these essential processes

3. Creating industry standards and related training to develop supply chain competencies
4. Promoting organizational adoption of a supply chain-focused operating model
5. Leveraging automation and advanced technologies to integrate supply chain processes for improved supplier performance

The basis for this roadmap, and building a foundation for sustainable supply chain performance, are 24 essential supply chain processes. Organizations that succeed at defining and integrating these key

processes systemically into their existing operations experience improved delivery performance, both incoming and outgoing in their business.

**The good news is that it's not too late. The bad news is the clock's running, and the next disruption isn't far off. OEMs, suppliers and industry groups must take action now. For a detailed look at the proposed five-step roadmap and the 24 essential supply chain processes, see [Delivering the Promise of Delivery: Toward a Resilient, Sustainable Auto Supply Chain, Part 2, Roadmap](#).**



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