

Operations Practice

Resilience in transport and logistics

The transportation-and-logistics sector is especially susceptible to economic shocks. Here's how to prepare your operations for a smoother ride.

by Sal Arora, Wigbert Böhm, Kevin Dolan, Rebecca Gould, and Scott McConnell

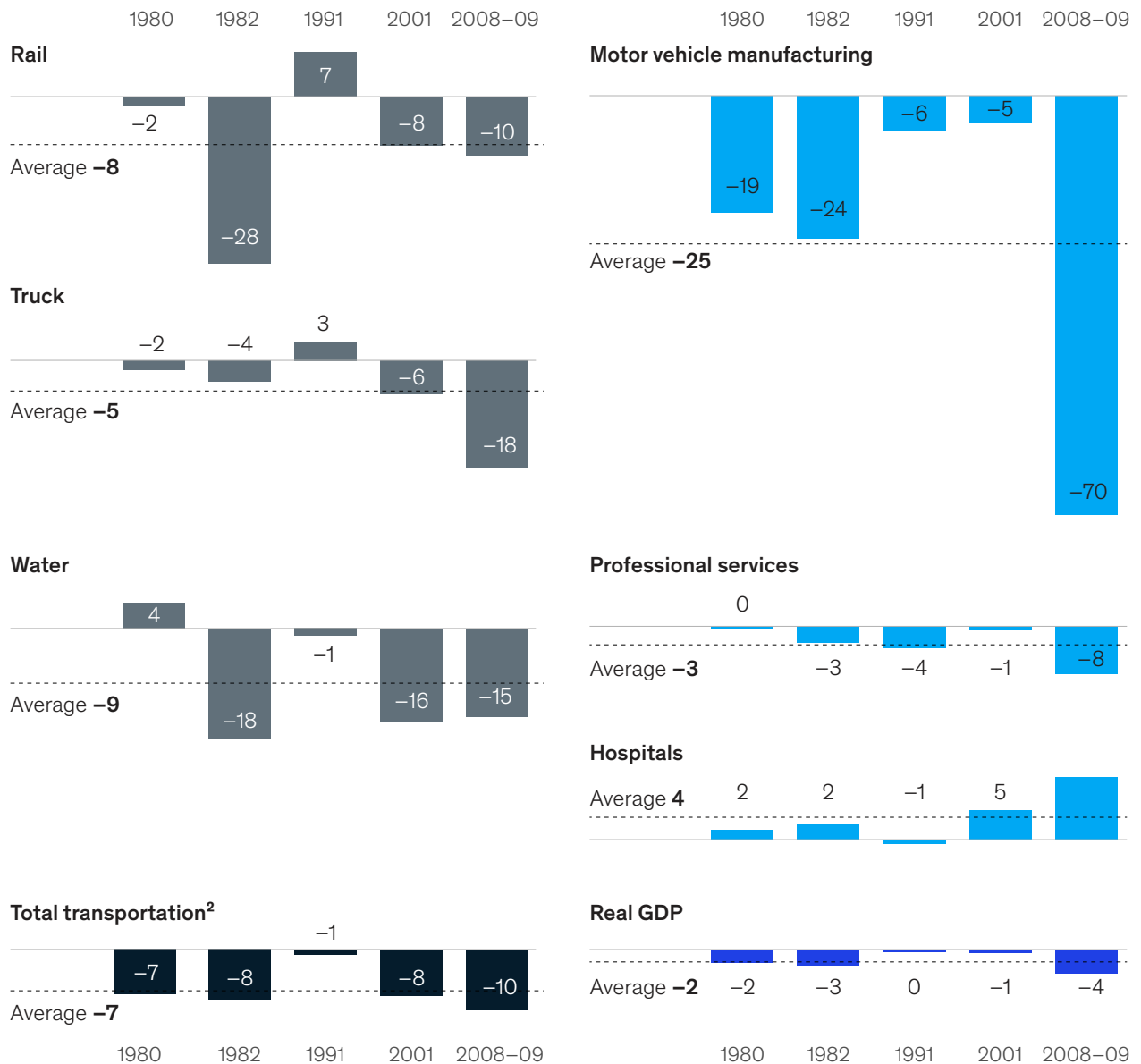


The transportation-and-logistics (T&L) sector has benefitted from many of the most important business trends of the past half century. Globalization, the evolution of sophisticated just-in-time supply chains, and the rise of e-commerce have all helped the sector grow at a rate broadly similar to the overall economy.

But it hasn't all been smooth sailing. Economic downturns tend to hit the sector particularly hard. Our analysis of the past five US recessions shows that T&L companies suffer more on average than the economy as a whole (Exhibit 1). And in recent cycles, the problem may have worsened. Truck transportation, for example, experienced little

Exhibit 1

Transportation and logistics activities are hit hard in downturns.



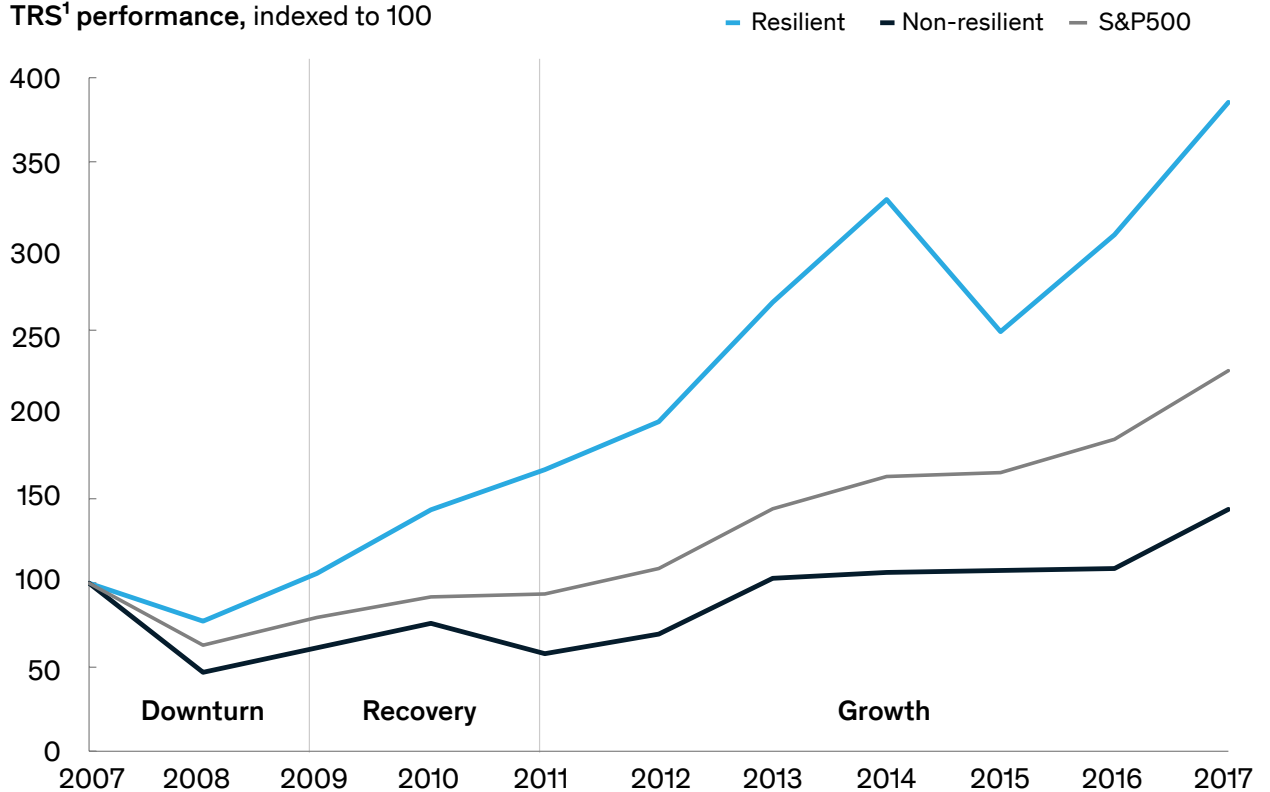
¹Measured in gross output: industry's sales or receipts, including sales to final users in the economy and sales to other industries (intermediate inputs)

²Includes rail, water, truck, air, pipeline, warehousing, support activities

Exhibit 2

Resilient T&L players outperformed competitors throughout the last economic cycle.

TRS¹ performance, indexed to 100



¹Total return to shareholders

Source: CPAAnalytics; McKinsey analysis

contraction in the recessions of 1980, 1982 and 1991. In 2001, by contrast, the industry shrank by 6 percent, and the 2008 recession triggered an 18 percent contraction.

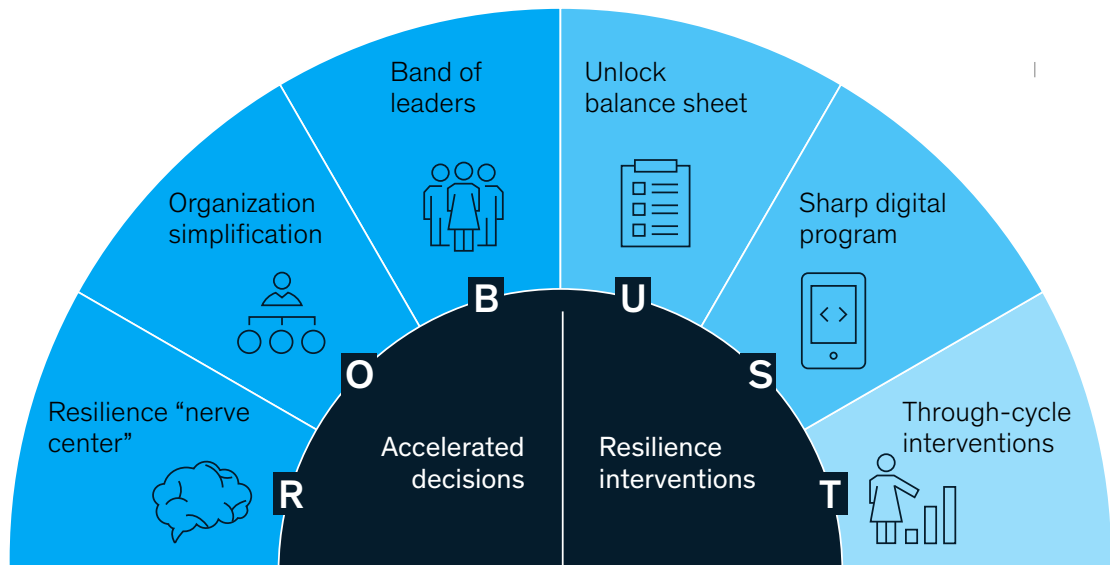
As in all industries, sector averages don't tell the whole story. Some companies ride out downturns much more successfully than others. When McKinsey analyzed the performance of around 1000 large, publicly traded companies through the 2007-2008 global recession, we identified a subgroup of "resilient" organizations that outperformed their peers by a significant margin over the cycle. The performance of these companies dipped less overall during the recession and improved faster during the ensuing economic

recovery. By 2017, resilient companies had delivered a cumulative total return to shareholders (TRS) that was more than 150 percent higher than their non-resilient counterparts. Among the logistics and transportation players in the study, the gap was even starker, at 267 percent (Exhibit 2).

A playbook for resilience

What made the difference? Part of the formula is fast decision making, enabled by a well-prepared organization. Our analysis also identified a playbook of specific interventions applied by resilient companies (Exhibit 3). In the lead-up to the recession, these companies took steps to achieve extra financial flexibility. They reduced

A new resilience playbook is emerging.



balance-sheet debt while competitors were piling it on. And when the downturn hit, resilient companies moved faster and further than others, selling off businesses and cutting costs through improvements to operational effectiveness.

That focus on cost and value helped resilient companies maintain their margins—and, even more important, their key customer relationships—through the crisis. It also put them in the best possible position to take advantage of the recovery. As the economy began to pick up, resilient organizations were ready to ramp up in response to growing demand, while also taking the opportunity to acquire new assets from distressed competitors.

Next time will be different

Business cycles are inherently unpredictable. Transport and logistics companies don't yet know if today's political and economic uncertainties will be enough to stall the economy, or how deep and how long any resulting slowdown will be.

What is clear, however, is that responding effectively to the next downturn will require a different approach. Getting past the limitations

of traditional performance-improvement methodologies oriented around head count and cost will require fresh thinking about boosting productivity.

That's especially true in the area of operating-cost reduction. In the decade since the 2008 recession, digital technologies have transformed the pressures and opportunities that logistics companies face, driving a significant rise in customer expectations, for example. Used to the speed, flexibility, and transparency offered by the best e-commerce operations, customers increasingly expect similar service levels across the full spectrum of transportation activities.

On the other side of the coin, companies now have new levers to pull in addressing operational costs and efficiencies, thanks to the availability of the Internet of Things (IoT), digital workforce tools, advanced analytics, and machine learning. Today's leading T&L companies are adopting these approaches to achieve dramatic performance improvements.

The new generation of digital tools can be applied across four broad areas of companies' operations:

their people, their processes, their supply bases, and their networks (Exhibit 4). Let's look at each in turn.

Manage your people digitally

Improved workforce management is a significant opportunity for T&L companies. The labor-intensive nature of many activities, combined with significant variability in labor demand and skills shortages in key roles, makes recruiting, managing, and retaining staff particularly challenging.

Leading players are now applying data and advanced analytic methods—such as machine learning and artificial intelligence—to a broad range of workforce-management tasks: demand forecasting, capacity planning, recruitment, daily scheduling, and task allocation and performance management. One road-transport company, for example, used a data-driven approach to understand and address the most significant factors that led to high rates of driver attrition. The company started with more than five million data points extracted from employee sentiment surveys, HR, payroll and finance systems, dispatching systems, and on-vehicle computers.

Using this data, the company built multiple models to analyze the factors that had the biggest impact on driver attrition. That work identified five specific clusters of drivers who were much more likely to leave, providing the basis for a number of targeted initiatives designed to address important pain points in the driver experience.

Moreover, models indicated that if the company achieved its attrition-reduction target, overall EBITDA would rise by about 4 percent. More broadly, our analysis suggests that an integrated digital workforce-management transformation—applying a range of different tools and techniques—can unlock 10 to 20 percent of additional value for T&L companies.

Automate and streamline your processes

New digital approaches can transform the performance of core operations as well. The right digital tools boost efficiency by revealing the root causes for transportation-asset failures, thereby reducing the need for high-cost overhauls—and by automating routine activities such as report generation. They improve quality, eliminating the errors that can creep in when managers and

Exhibit 4

For T&L companies, digital can improve cost and performance in four broad areas.

Manage your people digitally

- Advanced forecasting
- Demand and supply simulations
- Behavioral clustering and root-cause analysis to reduce absenteeism and attrition
- Automated scheduling



Automate and streamline your processes

- Always-on digital dashboard
- Process automation
- Digital task allocation
- Advanced analytics (e.g. Monte Carlo simulation) to optimize scheduling



Engage your supply base

- Automated analytics to understand demand and market dynamics
- Automation of routine transactional activities across the source-to-pay process



Reimagine your network

- Scenario simulation
- Complex route optimization



frontline personnel rely on email, spreadsheets, or paper documents. And they transform effectiveness, enabling decisions to be made faster, with more relevant, timely, and accurate data.

At one large rail company for example, the reliability of its thousands of locomotives had fallen sharply for years. Managers thought that a more robust, time-based maintenance program and additional overhauls would be an effective answer.

But when the company systematically analyzed seven years of locomotive-failure data, a different picture emerged. The root cause turned out not to be a lack of maintenance, but poor scoping and targeting. Managers fine-tuned more than 80 percent of the required maintenance tasks, saving more than 30,000 hours of maintenance per year thanks to more accurate, time-based maintenance rationalization. Overhaul costs fell by a quarter, generating savings that the company reinvested in new condition-monitoring technology that let it further improve maintenance and asset-replacement decisions.

For a different logistics provider, the problem was a large backlog of maintenance tasks. Pressure on technicians to increase their work rate only compounded the problem by reducing the quality of the repair work that was completed.

The company found that the main root cause was its cumbersome planning process. The task list allocated to technicians was updated only once a week, and they were instructed to complete tasks in the order presented to them. Since that order did not account for the issue's criticality or the location of the asset, technicians often had to travel significant distances to work on relatively minor jobs, while more important ones waited nearby.

The response was to build a new digital tool that allowed planners to cluster jobs by location, and prioritize tasks according to their likely impact on commercially important service-level agreements. The new approach saved maintenance managers

around an hour of planning work a day, while increasing maintenance efficiency by more than 15 percent and reducing service-level misses by more than one-quarter.

The opportunities offered by technology extend beyond the optimization of individual processes. Some leading transportation and logistics companies are now using digital approaches to link their operations from end-to-end, providing significant improvements to visibility, performance and responsiveness.

Engage your supply base

In recent years, logistics and transportation companies have become much smarter about what they buy—and how. Most have developed sophisticated procurement capabilities, such as comprehensive category-management strategies, improved negotiation tactics, and careful spend monitoring.

Building on those fundamental good practices, leading players are now using digital tools to further improve the efficiency and effectiveness of their purchasing activities. They're applying advanced analytics to understand the dynamics of their demand and the characteristics of the market, automating routine transactional activities across the source-to-pay process, and building integrated procurement platforms to enhance spend transparency.

One global logistics company recently used e-procurement tools to carry out two large tenders. One, for rail, covered 50 providers and roughly 5,000 origin and destination pairs for different container types and directions. The second, for truck services, covered 750 vendors and 12,000 lanes. Using a digital approach allowed the company to address more than a million data points across the two tenders, eventually unlocking additional price reductions of 5 percent for rail and roughly 10 percent for trucking.

Another large transportation company used a range of digital spend-management tools to capture savings of 20 to 30 percent in one of its most significant spend categories: tires. For more

One large rail company saved more than

30,000

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than a decade, the company had sourced new and retread tires from a single supplier, while leaving procurement of services such as tire repair and installation to the discretion of individual field locations. That approach meant no price competition for tire purchases, and no scale or consistency in tire services.

The company started from a clean sheet, defining a standard set of tire specifications depending on asset type, operating conditions, and tier positions. It then used advanced e-sourcing tools to generate request-for-proposals from numerous manufacturers. On the services side, the company applied digital mapping tools to analyze the networks of potential dealers, with the aim of identifying opportunities consolidate purchasing from a smaller number of providers.

Reimagine your network

Network optimization is fundamentally difficult. As they develop their networks, T&L companies face a multitude of complex, interdependent decisions, which must be made with incomplete data and for uncertain future demand.

Today, the development of powerful modeling, simulation, and analytics approaches is changing the way companies tackle complex network-optimization problems. The latest tools deliver deeper insights into not only the current performance of a network, but also its future performance—allowing organizations to identify bottlenecks, evaluate multiple alternative configurations, and rapidly stress-test their designs against a wide range of scenarios.

A shipping line looked at three potential changes to its network: adjustment of feeder connections, review of port calls with low yield, and replacement of expensive transshipment cargo with more attractive alternative cargo. Leveraging advanced analytics, it simulated the expected revenue loss, cost savings, and potential revenue-recovery probabilities for each possible intervention across all ship systems and cargo flows.

The project revealed opportunities to simplify the shipping line's network and capture several

million dollars in annual savings. To identify inefficient repositioning of empty containers, the line applied an algorithm that examined patterns in several million container movements. That project improved the steering of tens of thousands of containers across all geographies. Inspired by the results, managers throughout the company now use the tools developed for these analyses in regular reviews, driving continuous savings and performance improvements.

Another company, this time in the rail sector, used a simulation-based approach to optimize the long-term planning of its maintenance network. The company modeled the changing characteristics of its fleet over a ten-year time frame to understand future demand for critical maintenance resources. In only two months, that effort allowed the company to reduce its planned capital expenditure on maintenance facilities by about \$100 million.

Transformation, not intervention

The approaches described in this article are already being applied at transportation and logistics companies around the world. On their own, however, advanced digital tools are not enough to deliver real impact. Translating opportunities into value requires companies to make coordinated changes across their people, technology, processes, and culture—the type of systematic, large-scale transformation that involves a major commitment from leaders.

It won't be easy. But when is the right time to take the first steps? Right now. Nobody knows when the next downcycle will hit, how long it will last, or how deep it will go. As history has shown, however, the companies that prepare best for difficult times emerge strongest from them.

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