Spreading the benefits
Maruti Suzuki’s Sudam Maitra on developing India’s supply base

Getting control in India
Reports on Maruti, track and trace technology, and our annual conference in Pune

Magna Europe president Günther Apfalter reveals how critical logistics has become for Magna’s global business

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I love the expression: supply chain design,” a prominent logistics executive in China told me recently. This enthusiasm reflects a trend in the country’s latest wave of factory expansion. Rising production costs and historically inefficient logistics have prompted carmakers to pay closer attention to the shape of supply chains when planning plants and launching new models (see p56). A number are building large supplier parks and inviting tier suppliers to produce components or sequence modules close to the line.

China is not the only place with this emphasis on design. In another of many US examples, Volkswagen will double the size of a logistics centre at its Tennessee plant, allowing it to close two off-site sequencing centres.

While ‘localisation’ is now a major part of supply chain design everywhere from the US to the UK, China, and Southeast Asia (p62), the process cannot simply be about proximity to vehicle assembly points. If all carmakers forced vendors to move house, tier suppliers would lose manufacturing scale and the supply chain would suffer even more fragmentation. Logistics infrastructure must sometimes be ‘local for global’. At its South Carolina plant, for instance, BMW has built a warehouse for small parts mostly sourced in Asia, in which an automated storage and line-feed process has helped remove inventory from the assembly line and reduce handling costs (see p42).

Supply chain design must also include the sub-tiers. Material and logistics contracting terms often discourage this, but in India Sudam Maitra, Maruti Suzuki’s top executive for purchasing (which Maruti appropriately refers to as ‘supply chain’) is one executive who is passionate about working with suppliers. He is currently running supplier programmes on improving their logistics competencies, as well as doing shared currency hedging and bundled raw materials purchasing (see p16).

Part of Maruti Suzuki’s localisation strategy has included an in-house supplier consultancy, the Maruti Centre of Excellence (MACE), which works in supplier factories to reduce manufacturing defects, increase just-in-time deliveries and improve a host of other capabilities. A decade into its existence, MACE is now doing more to improve inbound deliveries from Maruti’s tier two suppliers. It’s an approach that serves the supply base as much as it does the carmaker, and is a good way to ensure supply chain design is not a zero-sum exercise.
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Communication in the supply chain is vital if the Indian market is to meet global standards, but who should invest to gain the value that track-and-trace technology and processes can add?

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cover story

16 Maruti Suzuki takes control of the supply chain

Sudam Maitra, senior managing executive officer for supply chain at India’s largest carmaker, has put supplier development and relations at the centre of Maruti Suzuki’s purchasing and materials management, including improving lean logistics at tier two and three suppliers.
Driver shortage a capacity threat in North America

The trucking industry in North America is pushing above 95% utilisation, with freight volume (including automotive) on the increase. However, short of the old high spot rate, the growth has not been enough to pose a real capacity crunch or push up rates for manufacturers and their transport providers.

Data published by the Council of Supply Chain Management Professionals (CSCMP) in its latest annual State of Logistics Report shows that increases in expenditure have largely moved in tandem with volumes shipped, with rates themselves flat.

"We have had a few brief periods when capacity was tighter in some markets, pushing up spot rates [but] those rates have fallen just as fast when loads fall," said Rosalyn Wilson, author of the report.

However, there are other factors driving freight costs in North America.

Logistics providers, such as Penske Logistics, are seeing a greater need to tender loads beyond core carriers to second and third tier providers because of a lack of driver availability, which is becoming a perennial problem for the trucking industry.

"The lack of drivers is a combination of the new hours-of-service rules and the carriers simply not having enough drivers working for them," said Marc Althen, president of Penske Logistics. The industry turnover average for staff is close to 100% for the large carriers, though Penske’s is 17%.

The situation is likely to be further affected by the legislated introduction of electronic on-board recorders (EOBR) by the US Congress, which are used to monitor driver performance. This could see drivers leave the industry at a time when they are most needed, according to Wilson. However, this is expected to mainly affect owner-operators and smaller companies as most of the main providers already use them.

Driver rule hits productivity

Nevertheless, Althen sees a link between a potential trucking capacity crunch and the driver shortage. For Penske’s dedicated carriage trucking business, the shortage already equates to a 2-3% drag on productivity because of the hours-of-service rule. To help counter it the company is using technology to maximise backhauls and reduce empty miles.

“We’ve also started a brokerage business to help further expand our potential pool of carriers to haul loads," he told Automotive Logistics. “Overall, the trucking industry needs to do more to help attract, train and incentivise the next generation of truck drivers. This may help alleviate some of the capacity issues in the future.”

It is a pertinent issue as the company picks up business with the growth of automotive manufacturing in Mexico, a market where Penske has been present for 17 years, though the company previously managed it exclusively from the US. Penske has 1,000 employees in Mexico and plans to double that to meet demand.

“In Mexico, we’ve seen a surge in the automotive sector with increased business with GM, Ford, BMW, automotive suppliers, as well as with other non-automotive manufacturers,” said Althen.

The growth in business from Mexico has led Penske to create a new managing director role for those operations. Michael Casidy took up the position last September, moving over from his role as Penske’s distribution centre management product line leader in the Western region, based in Texas.

Transport cost increase

Transport costs, meanwhile, showed a modest 3% increase in the CSCMP report and all modes posted revenue increases. The intercity truck segment rose 3.2% and the local delivery segment was 2.1% according to Wilson.

“Neither rate nor volume growth was particularly strong during the year, but the first half was much better than the second half,” she said.

Althen said Penske was using its resources to accurately manage its transport to deal with the rise, including co-mingling loads.

The company is also managing the gradual increase in logistics costs. US business logistics costs across the industries stand at $1.33 trillion, according to the report. Althen says that the biggest rise in costs has come from those of new trucks, whose prices have been rising for the past five years largely because of the introduction of new government emission standards.

Despite these and other price increases (including driver benefits), Althen said that Penske remained “very optimistic” about business growth and its ability to control costs.
Variations in global freight flows, including automotive production trends, are having an impact on shipping lines for both container and ro-ro cargo. Containers lines and freight forwarders continue to see a wide fluctuation in rates, particularly for westbound cargo moving to Europe. While ro-ro divisions have been sailing in somewhat smoother waters than their container counterparts, the shift in automotive manufacturing between some regions has already been impacting some lines, particularly for exports out of Japan and, to a lesser extent, South Korea.

Automotive is not generally considered a major driver for container shipping lines, although industry sources have reported a growing interest in the segment as ‘base freight’. That has been driven in part by the increase in global platforms and the launch of vehicle models across multiple continents. According to research outfit IHS Automotive, about 80% of platforms are expected to be multi-regional by 2020 (see p38 for more).

Currently, automotive has been noted as a positive segment for most freight forwarders, particularly in ocean segments. Ocean freight volumes for Panalpina rose 8% in the third quarter against the same period in 2012, with strong volumes noted in automotive, among other sectors. However, weakness in westbound trade lanes have had a more significant impact on rates. A spokesperson for Panalpina noted that in 2013 the company had witnessed “the biggest volatility in ocean freight rates ever” with rates on the Far East westbound (Asia to Europe) route moving within a range of more than $1,000 per TEU and within $750 per TEU between Asia and Latin America. That volatility meant a -1% gross profit per TEU year on year.

Another factor affecting rates was the increase of large containership deliveries, which led ship operators to constrict the supply of vessels and to reduce certain services, something that both Mitsui OSK Lines (MOL) and NYK Line reported in their most recent results. MOL stated that it had worked to restore rates following a six-month fall by “rationalising” services.

“The falls in rates for the Asia-Europe and North-South routes were particularly severe,” said the company in a statement.

NYK said that although there were several attempts to restore rates in its container shipping business over the summer, mainly on Asia-Europe routes, “a substantial rate restoration failed to materialise”.

Co-location and exports
For ro-ro carriers, there has been an overall increase in vehicle flows, however the trend for more model co-location of production across multiple markets has been having an affect on a number of carriers. The impact might be more severe in the next 3-4 years as carmakers shift manufacturing, in particular from Japan to North America, but also to Southeast Asia. Analysts including IHS Automotive expect that more production could also move out of Europe and South America to the US and Mexico.

Japanese carrier MOL reported a drop in the number of cars exported from Japan to Europe and North America in its Car Carrier segment.

“This primarily reflected prolonged stagnation in the European market and the shift of Japanese carmakers towards local production for local consumption as part of moves to step up such production,” said the company.

Wallenius Wilhelmsen Logistics (WWL) reported a 6% drop year on year for deep sea in the third quarter, hit mainly by a drop in high-and-heavy cargo. Eukor reported year-over-year improvements backed by positive development for Hyundai, though Kia volumes were negatively affected by labour conflicts. The carrier continues to move approximately 60% of combined Hyundai and Kia exports out of South Korea. However, the company said that lower demand for transport had had a negative impact on operational efficiency.

NYK Line, meanwhile, recorded a steady increase in car volumes year on year, driven primarily by robust car sales in North America. To meet demand the company put two new vessels into service to bolster the fleet over the first half of the year, while slow-steaming and other measures to make vessel operations more efficient were followed up to reduce cost.

For more on the global ro-ro business, see p38 in Finished Vehicle Logistics magazine.

Correction: The article on Renault’s expansion at its Tangier plant in Morocco in the October-December issue of Automotive Logistics (‘A milestone achievement in Morocco’, p32) contained a couple of errors on p34. STVA, the rail provider, did not play a specific role in building the rail line connecting to plant to the port. It was built by the Moroccan railway ONCF. We also referred to the distance between the port and plant as 25km. It is in fact 35km. Sorry. These errors have been corrected in the online versions.
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News: Threat to EU deal with Ukraine could hit imports
European carmakers hope political tensions in Ukraine won’t jeopardise its delayed trade deal with the European Union, which promises to remove most duties on vehicle imports.

Intelligence: What will China’s reforms mean for logistics?
The outline of the Chinese government’s reforms following its ‘third plenum’ congress could have a significant impact on the automotive logistics sector.

Data: OEMs move up list of top European supply chains
BMW and Volkswagen have moved up in Gardner’s annual ranking of the top 25 supply organisations in Europe, although Ford remains the only carmaker in the global top 25.

People: Shake-up at Nissan
As part of a big management switch at Nissan, John Martin, senior vice-president in charge of manufacturing, purchasing and SCM in Europe, is replacing Bill Krueger who carries out a similar role in North America.

Intelligence: Toledo wins GM/Wayne State supply chain competition
The university beat 19 rivals who gathered in Detroit to give presentations on supply chain cases provided by the carmaker.

Conferences: Brazil’s supply chain costs take off
Full reports from our global conferences, including from South America, where delegates discussed the challenges of controlling the impact of ‘custo brasil’ in logistics.

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Logistics is intertwined with global growth and government investment
5 North American ports buoyant
Growth for both vehicle imports and exports continues

Automotive Logistics Online

Q4 HEADLINERS

Penske Logistics is extending its use of JDA Software’s warehouse management tools to standardise its distribution centre systems globally. Penske will be working with JDA on adapting it to the specific requirements of each regional market. Suzuki Motor is planning to invest $49m to double output at its plant in Rayong, Thailand next year to 100,000 units, which along with the Swift will mean the addition of a new Alto model designed for the Thai and export markets.

Magneti Marelli has inaugurated a plant in Batu Kawan in the Malaysian state of Penang to replace facilities at Bayan Lepas that will boost production from 1.7m lighting units to 2.2m, supplying carmakers in Japan and the ASEAN region.

Panalpina has added 26 less-than-container load (LCL) services for Southeast Asia, including automotive services. The move will mean more sailings from Hong Kong to Singapore, Shanghai to Busan, and Singapore to Hamburg.

Jaguar Land Rover is planning to build a $392m facility in Brazil with the capacity to produce 24,000 cars a year from 2016. Sales of luxury vehicles in the country are set to triple by 2017. Audi, BMW and Mercedes-Benz are all already investing to capture market share.

Gefco is providing full and consolidated ocean container and air freight deliveries of automotive components to Buenos Aires from Europe and Asia for Argentine supplier Grupo Mirgor.
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Lifting of Iran sanctions a boost to French carmakers

The accord signed last November between Iran and six other countries, designed to curtail the former’s nuclear programme, involves the lifting of certain restrictions on the trade of vehicles and automotive parts for an initial six-month period. The move could be of particular advantage to carmakers with previous links to the country, including Renault and PSA Peugeot Citroën. The announcement also bodes well for business among transport and logistics providers active in the region.

The deal was struck in Geneva on November 24th and involves the US, Russia, China, France, Germany and the UK. Part of it involves the suspension of sanctions imposed on trade in the automotive and aviation sectors, as well as on petrochemical exports, gold and precious metals.

The cost to Iran in lost revenue since the sanctions were imposed in 2010 is estimated to be $120 billion, according to the US Treasury.

While economic factors will continue to affect sales, the lifting of sanctions should improve the outlook for consumers and carmakers in Iran alike.

“Should sanctions on CKD imports be suspended for six months, we might see a strong rise in CKDs (complete knockdown kits) shipping to Iran by Renault and PSA,” said Pierluigi Bellini, associate director and manager of the Middle East and Africa region at IHS Automotive. “This will not immediately translate into sales because the economic crisis would still be there, but at least those who would like agreement as they were also the ones that suffered more from the UN sanctions against Iran,” said Nicolas Meilhan, senior consultant at analyst firm Frost and Sullivan. “PSA used to sell almost 500,000 cars a year and had a 30% market share. Iran was its second most important market after France.”

In its last year operating in Iran in 2011, PSA sold 458,000 vehicles. When the company’s automotive division recorded an operating loss of more than €1.5 billion ($2.04 billion) for the year in its 2012 financial results, the suspension of sales of CKD kits to Iran was among the factors hurting results, along with a weak European market.

Renault, meanwhile used to sell around 100,000 cars in the country, mainly Megane and Logan models, and had a 10% market share. It assembled most of these vehicles with Tehran-based carmakers Iran Khodro Company (IKCO) and Pars Khodro. Iran was the eighth largest market for Renault and the carmaker used to sell more cars there than in Spain or Italy.

Following its withdrawal later in 2012, France’s second largest carmaker had to write off the value of its business in Iran, which hit Renault’s profits in the first half of 2013. Operating income and expenses over the period showed a deficit of €832m, of which €512m represented its entire exposure in the Iranian market.

Renault has welcomed the accord, but a spokesperson declined to comment further as it awaited further information on the conditions of redeployment for its activity in the country.

Good for Kia?

Iran was also an important market for Kia Motors in terms of both CKD and finished vehicle exports. Prior to sanctions imposed by the South Korean government on Iran in 2010, Kia was exporting more than 4,000 finished vehicles to the country and more than 17,000 CKDs for local assembly. Kia’s Pride hatchback accounted for between 30-40% of the brand’s vehicles in Iran.

A spokesperson for Kia Motors said the announcement of the nuclear pact would not have any immediate impact on the carmaker’s current business because it had yet to be notified by the related government parties about any consequent action on the easing of sanctions.

Logistics providers are also waiting to see how the situation develops and how trends in imports and exports are affected.

Grimaldi’s commercial and logistics director, Costantino Baldissara, who is president of the Association of European Vehicle Logistics, said that vehicle logistics providers hoped to benefit from the change.

Chinese carmakers have partly been filling the void left by the pullout of global carmakers, with the country an important export destinations for OEMs like Chery and Geely.
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Mary Barra replaces Dan Akerson as chief executive of General Motors in January. Barra moves over from her role as executive vice-president, global product development, purchasing and supply chain, and becomes the first female to take up a CEO role at a major carmaker.

Akerson’s responsibilities as chairman have been passed over to Theodore Solso, former chairman and CEO of engine and fuel systems supplier Cummins, who has been on the GM board since June 2012. Barra also joins the board.

“With an amazing portfolio of cars and trucks, and the strongest financial performance in our recent history, this is an exciting time at today’s GM,” she said. “I’m honoured to lead the best team in the business and keep our momentum at full speed.”

Barra has risen through a series of manufacturing, engineering, and senior staff positions over a 33-year career with GM and has been central to the company’s ongoing turnaround, according to the company.

Bo Andersson has become chief executive officer of Russian carmaker AvtoVAZ, replacing Igor Komarov, who resigned in October.

Andersson, who took up the post at the end of December and is the first non-Russian to head the company, has served as president of Gaz Group, the Russian bus and truck maker, for the past four years and was previously GM group vice-president for global purchasing and supply chain.

At Gaz, Andersson turned around the company’s losses and returned it to profit in less than two years. Improving supply chain management was an important part of the turnaround, as were including eliminating debt to suppliers and establishing better relations with vendors, including logistics providers.

Since December 2012, the Renault Nissan alliance has held a major share in AvtoVAZ when the carmaker and the Russian Technologies State Corporation created a joint venture to hold their shares in the company. The alliance intends to take full control by mid-2014.

Rui Zhu has moved from his position as supply chain director of Asia Pacific at tier supplier Lear Corporation, to take up a new role as senior director of supply chain at Chery Jaguar Land Rover Automotive, the 50:50 joint venture established last year between Chery Automobile and Jaguar Land Rover.

Rui will oversee material planning and logistics for assembly and local content. He will also be responsible for after-sales parts distribution centre management and management of vehicle distribution to dealers.

“I joined as senior supply chain director to take on the challenges of establishing the team, process and supply networks,” he said.

From November next year the joint venture will produce Jaguar and Land Rover vehicles, as well as a new joint venture brand to be announced. The production plant is based in Changshu city in Jiangsu Province, near Shanghai.

As part of some widespread management changes at Nissan, John Martin, senior vice-president in charge of Nissan’s manufacturing, purchasing and supply chain management in Europe, is replacing Bill Krueger who carries out a similar role for the carmaker’s North American operations. Krueger will become executive vice-president of Nissan’s Japanese Automatic Transmission unit (JATCO) with oversight of the Americas region.

Martin will now be based in Nashville, Tennessee and report to Jose Munoz, who became chairman of Nissan North America on January 1st 2014.

Martin was vice-president of the Americas region for supply chain management at Nissan North America between 2007 and 2009.

Prior to his role in Europe he was corporate vice-president, global supply chain management at Nissan in Japan.

Ceva Logistics’ current CEO Marvin Schlanger stepped down from the role at the beginning of January to make room for Xavier Urbain, who has moved over from his position as president of investment and trading company HL Holding. Schlanger resumes his previous position as non-executive chairman of the board at the company.

Schlanger, who took over as CEO in October 2012, oversaw an exchange offer earlier in 2013 on Ceva’s debt that led to a reduction in interest payments and a cash injection into the business.
Keeping on top of the custo

Regulatory and legislative changes are needed to improve infrastructure and reduce the cost of operating in Brazil, reports Christopher Ludwig

When automotive supply chain managers design their inbound, outbound or aftermarket logistics flows, they typically choose the best option between truck, rail, sea or river; air freight, while less common, is nevertheless used for certain components and time-critical flows.

In Brazil, the list of options is somewhat different. You can almost forget about rail – it’s used for only 2% of automotive component flows in the country and not at all for vehicle distribution, according to the Brazilian carmakers association, Anfavea. River transport is nominal and there are no short-sea, domestic ocean services. That leaves road, although Brazil again has a severe disadvantage: just 212m kilometres of its roads are paved, or about 6% in the country, with a large amount of these in the state of São Paulo (in the US, the figure is more than 4.2 billion kilometres).

Operation Chinook parts
However, as delegates heard at the conference, manufacturers have another option that would be rare in other markets: the helicopter. “We’ve used it many times in Brazil,” said Antonio Taranto, customer service operations director in South America for Ford, who has worked across the carmaker’s supply chain in Brazil and the US.

Maurício Faria, general manager for logistics in Latin America at Fiat, nodded his head in agreement. “We have also regularly used helicopters to avoid production stoppages,” he said. Earlier in the day, UTi’s director of automotive for Brazil, Fabiana Nakia, had also quipped about sending a helicopter to collect a container to keep a plant running.

The helicopter option was just one example of the peculiarities of Brazilian and South American supply chains revealed at the conference that result from severe constraints in the region’s transport infrastructure. Gustavo Bonini, manager of inbound logistics at truckmaker Scania and also the coordinator of a logistics committee founded at Anfavea earlier this year, said that during the peak of the season for grain exports in March and April, queues from the port of Santos in São Paulo can stretch dozens of kilometres. “It can take more than 12 hours to move just 20km to the port,” he said. He estimated that the distance could be walked in four hours.

Bonini pointed to World Bank data that showed the average price of exporting a container from Brazil had risen nearly 130% in the last five years to more than $2,200 – twice as high as in Germany and four times higher than China. The costs are similar for importing containers.

Fiat’s Faria said that the lack of rail options, along with...
inefficiency at ports, has led the carmaker to use road transport for long distances that would otherwise be cheaper and more effective to move by rail or ship. “We move 100% of component material between Brazil and Argentina by road, a distance of around 4,000km. It’s ridiculous that we do that, but it’s more competitive than moving by ship and it’s much faster,” he said.

The issues risk not only headaches and increasing costs, but could also hold back growth in the Brazilian and South American economies. Anfavea has set a target for the sector of reaching 1m vehicle exports by 2017, more than double the current levels. However, speakers broadly agreed that the country’s port and inland connections would not currently be able to cope with such levels. “If Brazil were to export 1m vehicles today, the ports would face logistics chaos,” said Sérgio Tanibata, director of business at Cisa Trading, Brazil’s largest car importer.

Living with custo Brasil

Such issues are part of what is commonly known in the country as the custo Brasil (Brazilian cost of living), and coping with this price in logistics was the theme of this year’s conference. Along with poor infrastructure and high taxes, Brazil has a complex and slow-moving regulatory regime. It’s difficult to expand or build new facilities, whether plants, warehouses or port terminals, because environmental licences can take up to ten years to be granted, according to Tanibata.

“There could be one crab living under a rock somewhere and a whole project is held up,” he said.

However, Brazil is making regulatory changes that could lead to more private investment, particularly for ports. A law passed earlier this year allows state-owned ports to grant concessions to private companies, which would be able to handle third-party cargo and use non-union staff. The rules are complex, however, and there have been legal challenges and disputes. Many at the conference were pessimistic about increases in private investment, at least for ro-ro operations.

“I’m sceptical about the port reforms and the impact for automotive,” said Tanibata. “I don’t see much government investment and I don’t expect that many would be willing to take the risk to invest in private terminals for vehicles.”

“I do see a good opportunity for container terminals, on the other hand,” he added.

Current investment in the rail network also appears to offer little hope for automotive logistics. José Ricardo Chiarrello, director of logistics for Volkswagen do Brasil, said that a project to build a north-south railway in Brazil would mean nothing for automotive logistics. “Rail is used for minerals in Brazil, not autos,” he said.

There was, nevertheless, hope that at least things were starting to move in the right direction given the reforms. The automotive logistics sector itself has also made a move towards coordinating its communication with officials. In March this year, Anfavea set up its first logistics committee. The group currently meets at least twice a month, according to Bonini, and is made up of OEM members of Anfavea, while also aiming to represent the voice of tier supplier and logistics providers. “It’s important that we come together now to voice our concerns in the automotive sector, especially as the government reforms port development,” he said.

A growing, but more uncertain market

The Brazilian market for new passenger and commercial vehicles is now the fourth largest in the world, with sales around 3.8m units, while production of vehicles is ranked seventh at a similar number. However, the economy has been unsteady over the past two years, with slower GDP growth and new vehicle sales levelling off. Sales are expected to finish the year mostly flat on 2012, helped partly by a reduction in the consumption tax that will expire at the end of the year.

According to Tanibata, the Brazilian automotive market appears to have entered a phase of greater instability and unpredictability, following nearly a decade of fast expansion. With sales more or less flat over the past two years, it’s unclear if the country will really reach the 7m unit sales projections without further economic reform.

However, import tariffs and localisation incentives have spurred investment in Brazilian manufacturing. The government has already imposed a quota on imports from Mexico, which has otherwise enjoyed a preferential trade agreement with Brazil. The ‘Inovar’ programmes for both

Delegates heard that while Brazil’s new passenger and commercial vehicle market was now the world’s fourth largest, a recently unsteady economy has led to slower GDP growth and a levelling of sales
vehicles and automotive parts aim to lure carmakers and tier suppliers to invest in local production and research and development in exchange for avoiding the 30% tax on imported parts and vehicles. It was measures such as these that quickly curbed a rise in imports from Chinese OEMs, such as Chery and JAC, and has led them to invest in local assembly.

Supply chain remains global
Efforts by the state and lobby groups to increase localisation have not offset the global links in production and engineering in the automotive supply chain. For years, the Brazilian market was full of vehicles adapted to the local market, including smaller and simpler versions of models that helped keep costs down. Its luxury and premium-vehicle market was also minimal. Now, however, carmakers such as General Motors, Ford and Volkswagen have been moving towards producing vehicles in Brazil that are based on global platforms, and which are also assembled in a number of other continents around the world.

“As of next year, our model line up in Brazil will be totally global,” said Ford’s Taranto. “This has led to huge complexity both for the inbound supply chain and the aftermarket that follows. Not all suppliers will have plants in all locations, so it has led to a huge transfer of materials around the world, including to South America.”

The dual growth in local production and imported products is important for logistics costs and operations, not least at Brazil’s ports. One of the largest problems for the country is the links between those ports and industrial and consumer centres, particularly outside of São Paulo. Speakers pointed out that the country actually has a reasonable network of ports, some with good facilities for containers as well as potential for ro-ro developments, such as São Sebastian in the south of São Paulo and Suape in the northeast. The problem was in connecting those ports to inland destination.

“Brazil has actually been investing in its ports for the past 20 years, but unfortunately the officials forgot about the road access,” said WWLs vice-president, South America, Flavio Batista.

Port reform and confusion
The port reform law, an important initiative of president Dilma Rousseff’s administration, is meant to play a decisive role in diversification and investment at Brazil’s ports. In principle, the concessions to private operators would allow such companies to invest in new facilities, be free to handle third party cargo, and to hire port workers from outside the dominant unions. In practice, uncertainty over the laws and legal disputes mean that it could still take years before any real private investment will begin, especially for ro-ro and vehicle-handling terminals.

“Nobody understands the rules on the port concessions, and it could take 5-10 years before legal disputes to develop certain land and port areas will be settled,” said Tanibata. He said that Cisa Trading, which runs a dry port in Vitoria in Espirito Santo state, is unlikely to get involved in bidding for a concession as it doesn’t see the business as viable.

The confusion around the port reforms developed into part of the reason why the logistics committee at Anfavea will be so important, said Bonini. The association has formed working groups, including for port operations, to deal with its conversations with the government. “We want to make sure that certain operational rules are put in place that will help the efficiency, including that the ports should operate 24 hours per day,” he said. “We also believe that there should be separate services at the ports, including dedicated terminals for commodities, including vehicles. There should also be appropriate waiting and rest points available for drivers.”

What of the future?
While it was evident that the supply chain problems facing Brazil are unlikely to be resolved anytime soon, when questioned on the outlook for the future, most OEM executives on the concluding conference panel were optimistic.

“The infrastructure gets worse and worse,” said Fiat’s Faria, “but maybe the government has been looking at it afresh in the past 12-15 months. Previously we couldn’t talk about private investment [in infrastructure], but we’re starting to see some movements. I don’t exaggerate the optimism, but things are happening.”

Gustavo Bonini told delegates that “discussing problems openly motivates us to find solutions. I am very optimistic. It will take a huge effort in blood, sweat and tears, but we have to overcome custo Brasil!”

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Raising the Indian supply chain

Sudam Maitra has worked to develop the Indian supply base for much of his career. Ramesh Kumar reveals how Maruti Suzuki and its top supply chain executive are spreading expertise and efficiency across the sub-tier chain.

Competition can do wonders for a business. When rivals outdo a company, it is often forced to explore possibilities that were previously unknown to it.

This is something Sudam Maitra, senior managing executive officer for supply chain at Maruti Suzuki, realised early in a purchasing career that has spanned three decades.

Had there been no competition, the soft spoken, meticulous mechanical engineer would have possibly moved slowly on creating new paradigms in procurement and supply chain at India's largest carmaker. Instead, he has been at the centre of a transformation that has not only allowed Maruti to prosper by working with efficient, reliable material suppliers and logistics providers, but his work has also contributed to the development of the entire country's automotive supply base.

From monopoly to competitive supply chains

Until Suzuki entered India in the early 1980s – then in partnership with the Indian government as Maruti Udyog – the motor industry's supply base in India was extremely limited, serving only Hindustan Motors and Premier Automobiles. Maitra recalls how the carmaker had to learn many lessons to arrive at the generally well functioning, lean and thriving supply chain we find today in India.

During its first decade, Maruti faced limited competition and hence paid less attention to the vendor base it had created.
to cater to its needs, or to rising costs. "Vendors used to come to us at the end of the year and seek price hikes for their supplies, citing increases in input cost," Maitra says. "We invariably bowed to their demands because we enjoyed a monopoly situation and managed to hike our prices consequently."

That situation changed dramatically once competition increased and more carmakers entered the market. Quality products had to hit the dealers at prices lower than those of the competition, and achieving this cost began in purchasing, says Maitra. Maruti switched its procurement approach to 'target costing'.

"It is sort of a reverse calculation," says Maitra. "Once we arrived at the vehicle's market price, we fixed material costs. Vendors were shocked initially. We told them, 'enough of this upward price revision every year. Now you need to look at downward price revision every year'.”

Suppliers met this change with stiff resistance, including walkouts. Sensing the challenge, Maruti Suzuki's executives eventually realised that to achieve deep cost reduction year on year, the company would need to work together more with suppliers. "Unless this is carried out, we cannot bargain with them to reduce the cost when their final product is ready for delivery," Maitra says. “It was then that we in purchasing truly realised that it is a chain. So we also changed the name from ‘purchasing and vendor development’ to ‘supply chain’.”

**Global expertise for global products**

This shift would become even more important as Maruti Suzuki built more global vehicles, the production and launch of which coincided with those in other markets. Supply chain complexity and coordination became even more complex.

"Before 2005, [managers] would go to Japan where all Suzuki models would be lined up and they would identify one or two models that may suit Indian conditions and then bring them here," he says. “Since Suzuki had taken a majority control in Maruti Suzuki around that time, it was decided that henceforth all launches from its stable would be global ones. For instance, Swift was launched simultaneously in Japan, Hungary, China and India.”

That shift has had huge implications for the supply chain. “Earlier, we used to bring designs from Japan and pass them on to vendors to copycat them,” Maitra explains. “Since 2005, things have changed due to this simultaneous global launch phenomena. Here, the challenge was to ensure Indian suppliers’ input on design should also be incorporated in the final design. This led to the concept of ‘concurrent engineering’. In a way, we were moving towards collaborative modules with our suppliers, which again was a paradigm change. Many vendors were unable to rise up to that level.”

It was around this time that supplier development started to become even more important for the supply chain team at Maruti, both in establishing global suppliers in India, as well as nurturing smaller, local suppliers.

Generally, Maruti Suzuki defines three categories of suppliers: fully owned, global suppliers (such as Visteon and Delphi, as well as logistics providers like NYK/Yusen); the second is large Indian companies that went in for joint ventures with foreign companies (such as Sona Koyo, Krishna Maruti, etc.); the third lot is small Indian suppliers, such as for sheet metal or plastic components, that operate with no foreign equity or technological collaboration.

When Maruti switched to global launches, it was the third category that was largely unable to participate in the ‘concurrent engineering’ route, according to Maitra. He says that they were good at reading drawings and manufacturing them, but many lacked design skills.

To remedy this situation, Maruti set up a separate division within Maitra’s supply chain wing to identify foreign technology firms and match them with Indian suppliers. Maruti advised the third category of suppliers to get

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While early in its history Maruti Suzuki could operate as a monopoly, its purchasing focus has shifted strongly towards collaboration with suppliers
Maitra encouraged Indian suppliers to develop partnerships with global suppliers to help improve their design and engineering capabilities

into tool design with these companies, which is generally considered easier than product design. This matchmaking exercise began in 2006 and has so far led to 18 collaborations. Not all of them have lasted. Some foreign partners, having
tasted the Indian automotive market through collaboration with local companies, wanted to then set up wholly owned subsidiaries. “There is some amount of heartburn from the Indian companies but the positive factor is that they have already imbibed or learned design capabilities,” says Maitra.

Today, the supply base in India has blossomed. Maitra works with more than 400 vendors, including global, Indian and joint venture suppliers. He says that such a variety of choice is important because of uncertainties in logistics, labour and infrastructure in India. For example, Maruti Suzuki will often have three suppliers for some parts. “We just cannot afford to depend on one or two,” he says. “In India you are not sure of many things: work stoppages at factories, highway and transportation challenges or port challenges, for example. The availability or access to more suppliers is a blessing.”

Maitra and his team remain highly focused on supplier development today, including helping vendors to improve lean manufacturing and just-in-time logistics. “Our aim is to help them to achieve manufacturing at absolutely minimum cost. Productivity at its highest and the best quality.”

Suppliers are grouped into clusters and taught ‘pull’ and ‘just-in-time’ manufacturing in classrooms for a fortnight. Following this, projects at vendor locations are taken up for identifying where there is maximum pain: high inventory, low productivity and high manpower, for example. Maruti experts then work with suppliers for six months to help them improve further.

The company has even set up a special unit to work closely with suppliers. The Maruti Centre for Excellence (MACE) is made up of a group of engineers that focus on supplier quality, including periodic audits and consulting on project implementation (see box on p22).

**The path to localisation**

Maitra’s mantra for purchasing is simple: localise and keep the cost as low as possible. Do anything and everything legally possible to achieve that goal. As well as dealing directly with suppliers, Maitra has also done hedging in foreign currency for Maruti, as well as for commodities such as copper, aluminium, platinum and palladium—a first in the Indian automotive industry.

Localisation of suppliers and components has been an important part of Maruti Suzuki’s supply chain development over the past decade or more, not least to avoid exposure to currency shifts and higher logistics costs. This process started with a redefinition of what ‘local’ meant. In the past, the carmaker followed criteria for supplier localisation from India’s Directorate General of Trade and Development (DGTD). These rules state that if a part is invoiced on Indian

soil, it is considered ‘local’, even if most production happened abroad and the product was sequenced and packaged in an Indian warehouse. This was the case with much of Maruti Suzuki’s own production, as well as those of the suppliers that came over from Japan and other locations.

in India you are not sure of many things: work stoppages at factories, highway and transportation challenges or port challenges. The availability or access to more suppliers is a blessing – Sudam Maitra, Maruti Suzuki

Components used to be considered ‘local’ if they were invoiced in India, but today Maruti looks more carefully at their production origins
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The result was a distorted picture for localisation of the Indian supply base. According to the DGTD definition, Maruti Suzuki already had a localisation rate of 99% in 1996. However, the invoicing loophole could not hide risks from foreign currency exposure and other supply chain costs, which were taking their toll on the carmaker’s global procurement bill.

“Our understanding was that if there were any foreign exchange variations, Maruti Suzuki would compensate for them,” says Maitra. “But as the Japanese yen got stronger, leading to higher outgoings for imports, it caused a big dent in our profitability.”

Maruti has since changed its definition for local suppliers. “Even if a ‘child’ part comes from overseas, it will not be considered as ‘local’. As per our present definition, localisation is around 80-85%.”

For operations and design, Maitra and his team have also targeted reductions in weight. “We have a strategy called 1-1-1 on the raw material side, which is the brainchild of our chairman, Osamu Suzuki,” he says. “The goal is to reduce

**IF THE LOGISTICS IS ALREADY WORKING FINE, WHY BREAK IT?**

_Ramesh Kumar:_ You’re planning a new manufacturing facility in Gujarat. Will you entice suppliers to set up factory-side facilities?

_Sudam Maitra:_ It will be a mix-and-match. Today, we have a lot of suppliers from western India already, and they will be in an advantageous position. Of those suppliers from the north who have good quality, service and cost, we will bring them [to Gujarat]. Today, there are several suppliers who are not supplying to us, but they supply others. We will also bring them in to inject new blood into the supplier universe.

_Kumar:_ Material handling is critical for line supply. Is palletisation progress happening too slowly?

_Maitra:_ For this we have a separate department. Every time new product development starts, we design how it is going to come into the factory: by bins, trolleys, etc. Once approved, suppliers are told how to dispatch to our plant. As part of our greening system, we use returnable bins. There are no carton boxes at all. To save space and cost, we have also gone in for foldable bins. Since 2012, we work with Chep India to ensure all bins coming into our plant are also collapsible.

_Kumar:_ Are you averse to working with 3PLs?

_Maitra:_ No. We have many suppliers from Chennai and we have been asking them to come nearer to us. What they have done is to have a small warehouse in NCR [Delhi] where they do a bit of value addition that is managed by their [local Indian] 3PLs. Sometimes, time-bound deliveries can be an issue for them. Our experience with global 3PLs has been extremely good. We work with Ceva Logistics, for example. They are good.

We are debating whether we should use 3PL services in our proposed Gujarat plant or not. Involving 3PLs in our current plants in] Gurgaon or Manesar would mean an increase in cost. When you involve a 3PL, the suppliers’ responsibility gets diluted. It becomes the 3PL’s responsibility and we are not comfortable with that situation yet. We are working on JIT formulas and can’t afford any lapses on that issue. If something is working fine, why break it? However, we have not shut ourselves off from 3PL involvement.

_Kumar:_ What are the biggest challenges you’re facing?

_Maitra:_ One of the challenges is overall risk management of suppliers. The Japan earthquake taught us a lot. One day at that time, I was told that a paint supplier defaulted in sending mica paint. Though this supplier is from India, the tier three supplier of pigment was based out of the Fukushima [Japan] area. We were not even aware of that supplier until this crisis happened. Then, following the Thailand floods, a supplier for Panasonic in Thailand could not meet its obligation. As a consequence, we had to sell our vehicles without Panasonic audio sets for six months.

_Kumar:_ Do you have a strategy for managing supplier risk from a sourcing point of view?

_Maitra:_ It is a big thing for us. In the past one year, we have plotted every single supplier in different areas, including operational capability, financial capacity and the labour situation at plants. On the basis of these inputs, we have come out with a dashboard view of the supply base. At the touch of a button on my desk, I’m able to check a supplier’s vulnerability. We also have an ‘actionable library’. If something goes wrong, we have outlined what steps to take. We have done this exercise all the way to the tier three level’s geographical location.

At the tier one level, we do 100% surveillance because they are very critical for us. We expect tier ones to monitor tier twos since we cannot do everything at our level, although we are always available if there is a quality challenge at the tier two level. Of late, we have created clusters of tier twos and conduct periodic reviews of their operations in a limited manner.
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the weight of every component by one gram. Costing is based on weight, so every single gram of weight reduction is a positive.” According to Maitra this has led to Rs120m ($1.9m) in savings each year.

Partnering with suppliers
A relentless focus on cost masks Maitra’s commitment to partnership in the supply chain. While he wants to keep costs low, he is not looking to beat up on suppliers. “If we keep squeezing suppliers in protecting our interest only, then in the long run we cannot sustain,” he says.

Maitra has implemented measures designed to help suppliers. Recently, India’s central bank gave Maruti permission to hedge currency on behalf of Indian suppliers. The carmaker also buys raw material for suppliers in bulk to help companies get a better price; it arranges low-cost funding for suppliers. For a small fee, payments are also fast-tracked, with just a nine-day cycle from the date of invoice submission.

Maitra admits that suppliers unable to meet cost targets will struggle. However, he recognises that it cannot be all pain and no gain. Maruti has introduced shared savings programmes with suppliers, called ‘value analysis value engineering’.

“If suppliers are going for localisation of child parts instead of importing, for example, we will share the savings,” says Maitra.

Maitra is proud of Maruti’s vendor relationships, something his tier suppliers have backed up. Anand Swaroop, president and group chief financial officer of Indian tier supplier JBM Group Limited, which has a joint venture with Maruti Suzuki, says that “it is not a buyer-seller relationship, but a partnership”. (See box on p24.)

Swaroop points to areas such as help with raw material procurement and assistance with bank financing as important support mechanisms from Maruti.

**BRING ON THE BAD BOYS!**

“Bring the bad boys” might sound like an unusual statement from Raghunath Balkrishna Madhekar, senior advisor at the Maruti Centre of Excellence (MACE). But when Madhekar speaks, people listen. It was Madhekar, who has worked at Maruti Suzuki for three decades, who affixed the ‘FC OK’ sticker on the maiden Maruti Suzuki 800cc that was flagged off by the late Prime Minister, Indira Gandhi, on December 13th, 1983, after the engineer inspected the vehicle for its functions, appearance and performance.

The ‘bad boys’ he’s talking about are poor performing tier suppliers. And Madhekar and his team are anxious to help them. ‘Bring the bad boys. We will scale them up,’ has been the general refrain at MACE, according to Madhekar.

“Only 20% value addition happens at the Maruti Suzuki assembly line and the balance comes from vendors. So the quality of every single vehicle trundled out depends on the material quality supplied,” says Madhekar.

Madhekar was put at the helm of MACE when it was started almost a decade ago with the core objective of upgrading the quality of vendor suppliers via systematic training. Of Maruti’s 400-odd vendors, 25 opted to be part of MACE, a non-profit registered society, by contributing Rs2.5m ($40,000) each towards the initial corpus.

According to Anand Swaroop of JBM Limited, one of several joint venture companies floated by Maruti Suzuki with local partners, MACE has been a blessing. “It has brought us Japanese knowhow and Japanese training, along with a new business opportunity,” he says.

Although the supply chain arm of Maruti Suzuki created MACE to upgrade tier ones vendors, Madhekar thought it should go deeper than that. When tier one vendors narrated their challenges with their own suppliers, MACE came up with a cluster approach to train and assist in upgrading the suppliers’ supply chain.

The supply chain arm has set targets in terms of defects, ranking and problem parts per million (PPM). Zero defects remain the ultimate goal. Thanks to MACE, concepts like lean manufacturing, the Maruti Production System, muda (Japanese for waste) and value addition are common vocabulary on the suppliers’ assembly lines.

Today, the defects for most participating suppliers have crashed from thousands to a few hundred PPM and even much lower for some. “It was tough for them,” admits Madhekar.

But it was equally challenging for him and his original three-member team back in 2004. They had to conduct a gap analysis, help vendors in data capturing (because most had no data until then) and convince vendors to spare workers for training without disrupting Maruti Suzuki supply lines.

As of today, there are 19 clusters belonging to 13 of the original vendors who contributed to the original corpus, while 120 clusters of tier two vendors are operational with regular monthly reviews. Out of 120, 14 vendors have achieved zero PPM and maintain that level consistently, MACE and the Sudam Maitra-led supply chain arm of Maruti Suzuki work in tandem. “We keep hearing that some of our tier two vendors are better than tier ones,” adds Madhekar.

Originally it was thought the cluster approach would only last for two years; it turned out to be a never-ending chore. But Madhekar, like clients such as JBM Limited, is not complaining.

**In our cluster programme, we keep hearing that some of our tier two vendors are better than tier ones – Raghunath Balkrishna Madhekar, Maruti Suzuki**
If we keep squeezing suppliers in protecting our interest only, then in the long run we cannot sustain
– Sudam Maitra, Maruti Suzuki

“Having learnt this proactive approach, we try to replicate this with our vendors too,” he says.

**Improving inventory through the tiers**

Logistics has played a particularly important role in keeping overall supply chain costs as low as possible, particularly in reducing inventory, says Maitra. He recounts how by tightening its material quota, Maruti was able to lower inventory across the supply chain.

“We used to give suppliers a month’s schedule of our material requirement,” he says. “Because of our nine-day payment cycle, they would finish their quota in 21 days. As a materials person, I would invariably enter the plant via the materials gate. When I wouldn’t see any trucks at the gate towards the month end, I used to get panicky, wondering if I would soon be getting calls from the lines saying some materials had not arrived. However, we realised that suppliers produce more and our inventory levels were going up, too.”

In response, Maruti Suzuki lowered its material quota from a month to 15 days. Inventory levels inside the plant fell by a whopping 70%. “Now we are advising our tier one suppliers to implement a similar system with their own suppliers so that the chain becomes lean at that level too,” Maitra says. He adds that he would also like to implement more JIT processes among tier two and three suppliers.

Maruti Suzuki lowered its material quota to suppliers from one month to 15 days, increasing regular deliveries and reducing inventory.
We want to keep a mix of VMI and 3PL-managed inbound operations. If we do not do it all, how will we know which is the best? – Sudam Maitra, Maruti Suzuki

Maitra says that his team is constantly pursuing logistics improvements, including studying new routes and trade options. Currently, about 80% of imported material arrives through the congested Jawaharlal Nehru Port Trust (JNPT) in Mumbai. The rest, including steel coils imported from Japan and South Korea, arrive via Kandla and Mundra in Gujarat. Maitra says that Maruti Suzuki is exploring the port of Pipavav on the Gujarat coast, which could eventually tie up with the proposed Maruti Suzuki plant in the state.

One important improvement came when Maitra convinced Suzuki in Japan and its shipping lines to dock at Indian ports once a week instead of monthly. Earlier, the same ship carried materials for Suzuki in India and in Pakistan. But because of poor relations between the two nations, the Suzuki Pakistan consignment was unloaded in Singapore for transhipment directly to Pakistan. This delayed the India consignment for at least four days since it had to go to Indonesia to get the ship loaded to its full capacity.

**THESE GUYS ARE DIFFERENT**

JBM Group is an Indian tier supplier that has seen turnover rise to Rs1,200 crore ($192m), including a large joint venture with Maruti Suzuki. Anand Swaroo, president and group CFO, has been with the company from the beginning.

Maruti Suzuki is a vendor-friendly company. Ours is not a saas-bahu [mother-in-law and daughter-in-law] relationship. They work with vendors and don’t thrust and impose their dictats. They treat you like partners and bring you up. They are there at every single step giving you support in terms of quality, production facility and logistics. Without this relationship, we would have remained just a supplier of seat components. Today we are a systems supplier.

Localisation is the focus. It is not just a cost reduction approach, but an excellent learning opportunity. Waste reduction is achieved through joint efforts and benefits realised thanks to a transparent and collaborative relationship. Regular meetings at every level – right from CEOs to the shopfloor level – give you confidence and better future prospects.

Maruti Suzuki’s vendor upgradation programme, scripted by MACE, is a wonderful experience. Normally, you don’t find OEMs willing to deal with tier two vendors. These guys are different. Today, based on MACE training, we are able to service other auto OEMs as well. However, although we have no restrictive clauses, JBM caters almost 90% of its capacity to meet Maruti Suzuki’s needs. We have even set up separate companies for other OEMs to focus our resources on Maruti.

We no longer talk of ‘rejections’ at JBM. Terms such as lean manufacturing, supply chain and zero defect are very common and familiar to us. At one point, we had 2,000 PPM. Today, it is 5-10 PPM. We are trying to replicate what we have learned with our 4u-odd vendors via clusters. We can claim that we noticed a 60% improvement in the performance of our vendors after MACE conducted training and upgradation of skills.

MACE will not leave you until you reach the right level of perfection. It is a never-ending exercise. We have no complaints.

Maruti Suzuki now uses containers that transport car exports by rail to ports in Gujarat and then return back to the plant carrying steel coils.

“We told Suzuki that the relationship between Suzuki Pakistan and Suzuki India is excellent and there is no need for segregation at Singapore. Now the practice has been stopped and we saved at least four days in voyage time,” he says. “The ship from Japan stops at JNPT and then goes to Karachi.”

The company is also tackling waste reduction. Steel coils arrive in trucks from the port, which had always returned empty. Similarly, containers carry cars by rail to Mundra for export and return empty. Now, Maitra and his team have arranged that the containers carrying cars can bring back coils to the plant. It’s such a successful change that Maruti workers have rechristened the containers as ‘coil-tainers’.

**Trying a pint or two of milkruns**

Maruti Suzuki spends about 2.5% of net sales on inbound logistics, as it relies mainly on vendor-managed inventory. Maitra admits that milkrun processes had previously been indigestible for him (see box out p20). However, the company has moved more towards using 3PLs to manage parts of inbound logistics. “Toyota has gone in for the total 3PL route. We decided to get into these modern concepts too,” he says.

“But our experience has been that when the vendor manages his supply, the cost is lowest when compared to the 3PL route.”

The carmaker has experimented with milkruns from Faridabad, close to Gurgoan, with Ceva. Maitra says all suppliers can track supplier movement on a handset. Now he is deliberating whether to introduce milkruns at other locations, including Bawal, Rohtak and Manesar.

“We want to keep a mix of VMI and 3PL-managed inbound operations,” he adds. “If we do not do it at all, how will we know which is the best?”
Tracking progress

Had the Japanese not invented just-in-time (JIT) and zero-inventory concepts, life would be much simpler. Manufacturers would be stocking a few months’ requirements at their factory premises or nearby warehouses to feed their assembly lines as and when needed. Few would have developed lines on their foreheads worrying about how quickly their supplies would reach factory gates and move to assembly lines without production disruption. Nor would supply chain visibility be so vital.

However, such system processes have spread the world over, including to India. Supply chain visibility has become one of manufacturing’s most important support functions. Gartner analysts Christian Titze and Tim Payne point out in a recent report that since many companies have heavily outsourced their supply chains, they must work more closely with suppliers to maintain visibility. “Because of the need for collaboration and co-ordination to reduce risk and maintain efficiency across extended networks, end-to-end visibility is critical to complex global supply chain success; technology solutions can help to enhance multi-enterprise, multi-tier collaboration and visibility,” they wrote.

Some companies have taken to military tactics to control their supply chains, setting up ‘control towers’ that monitor flows. In India, such an approach has attracted less interest, partly because of supply base locations and delivery terms. Fiat India Automobile’s Kalpesh Pathak, assistant vice-president for supply chain management, does not see a need for control towers because the supply base is concentrated close to plants, and because carmakers procure logistics on delivery terms that leave transport to suppliers.

“Therefore, we are not doing consolidation and optimisation of inbound movement because of locational advantage,” he says. “Very few Indian companies – irrespective of verticals they operate in – have this concept of the ‘control tower/room’.” (See p.29.)
However, OEMs have shown a desire to gain more control over their logistics operations to avoid disruptions. Hyundai Motors India together with Glovis, its logistics subsidiary, are among the most serious about visibility. Glovis built a ‘control room’ to monitor inbound and outbound flows for Indian cargo movement and global component exports. It’s part of improving what Glovis India managing director Min Joo calls “customer delight” (see box below).

Cloud-based solutions have not surfaced even globally...users in one vertical and are concerned about information leaks to competition and the level of customisation sought by each user – Ravindran Natarajan, Trimble

While the dynamics of the inbound supply chain may not require control rooms for all OEMs in India, there is a rising interest in a variety of tracking tools, including for outbound logistics. “For outbound, 100% of carriers are now fitted with GPS/GPRS tracking devices,” says Achal Paliwal, head of logistics and exports at Honda Cars India. “This information is integrated to Honda’s in-house logistics management system, wherein information is visible online to all stakeholders. As inbound is vendor managed, such information is available on demand, but not integrated into any platform.”

Although Honda, which implemented its outbound control tower-type operation three years ago, would prefer to have information in real time, Paliwal says that the first step has been to have updates at pre-determined intervals, as there are integration problems with multi-supplier tracking systems. Moving from tracking flows in silos towards integrating them into a single entity has been difficult, admits Paliwal. However, the efforts were worth it because of the impact on provider performance, reduction in queries and response time as well as having more reliable information. It all adds up to better customer satisfaction. “It is a first step toward automation,” says Paliwal. “Our final goal is to integrate info feed from all LSPs on a real-time basis.”

India’s largest carmaker, Maruti Suzuki, also tracks its outbound movement through several tools provided by IT specialists Trimble Transport & Logistics and Elkon. US-based Trimble, which has been in India for more than three years, uses on-board and cellular technology to provide both GPS tracking as well as control and monitoring, according to Ravindran Natarajan, head of business development for Trimble’s South Asia region (SAARC). The company currently serves Maruti Suzuki, Hyundai Glovis and Hero Motocorp, and is also used by carriers themselves, such as Agarwal Packers & Movers, which has a fleet of nearly 1,000 trucks.

TURKISH DELIGHT AT GLOVIS

Cho Jae Hong, alias ‘Joe’, is thrilled. He has just succeeded in his mission of creating a ‘central control room’ (CCR) for Glovis India, Hyundai’s logistics subsidiary.

The project, which was initially mooted three years ago, was completed in record time by the young assistant manager for sales and procurement at telematic firm Hyundai AutoEver (which, like Glovis, is owned by Hyundai Motors) and his team. So far, Glovis, Hyundai Motors India and its overseas clientele elsewhere are happy with the outcome.

It all began when Glovis India’s Min Joo started exploring opportunities to provide ‘extra customer delight’. Supply chain visibility was determined to be near the top of customer wish lists. “We noticed a lot of companies undertake trace and tracking of vehicle and vessel movements on surface, air and ocean,” says A Ramana, senior general manager of Glovis India, and Glovis’s pointsman for this project. “We began to ask whether these activities were meaningful and results-oriented.”

Once Min Joo greenlit the project, Joe jumped in. “My brief from top management was a quick roll-out”, he says. Joe identified local software and hardware vendors, facilitated exchange and dialogue on Glovis India’s requirements, demonstrated the project at an exhibition in Chennai, and trained manpower to handle daily operations for the roll-out – all in a span of ten months.

Along with domestic inbound and outbound cargo movements, one area that the company decided to focus on was flows between India and Turkey, as Hyundai exports parts produced in India to its Turkish plant in Izmir.

Meenakshi Bhaskar, senior officer at Glovis India and part of the CCR project, tracks the containers carrying auto components from India to Turkey, including monitoring the vessel movement from the crowded port of Chennai to Eyyap port on the Turkish coast, to ensure her client is fully aware of the status of the vessels carrying components.

“Where they are and when they will arrive are key questions,” she says. “We also track the status of containers, including how long they were kept at any port. This input is essential to ensure they clear incoming boxes within the stipulated time and save them...
Elkon India, a Subsidiary of Efkon AG in Austria, also offers value-added tracking services to Maruti Suzuki in a large way, as well as factory-fitted GPS for Mahindra, Daimler and Volvo Eicher. “Maruti did not sign us up just for tracking, but for the value-add we proposed through eLSS (Efkon Logistics Support System),” says Anshuman Roy, chief operating officer at Elkon India, citing reductions in road damage, better fleet utilisation and better on-time delivery as important results. “Cost matters but that is not all.”

Indeed, a GPS-tracking system on its own is not a cure-all, not least because it is not always reliable. “On the outbound side for Fiat, GPS roll-out is currently about for 65% among carriers,” says Pathak. “It’s possible that vehicles are GPS-fitted, but the system doesn’t work.”

**Market potential**

Bangalore-based promoter-director of ATIC Data Systems Satish Ranjit sees a bright future for tracking services in the Indian automotive sphere. “Tell me, why should Maruti invest in Trimble? It is not just monitoring locations online from coughing out demurrages or whartage.”

Until the advent of the CCR, this work was carried out by collating inputs provided by liners and sending an e-mail. Now, Bhaskar posts actual locations every day on a global map (regularly, although not in real time), which facilitates better visibility for all stakeholders.

Soumya Chakraborty, senior officer for container freight station (CFS), and now part of the CCR team alongside Bhaskar, visualises better times ahead now that the tracking and monitoring is in place. He points out that on any given day, there are more than 2,500 vehicles on the move in India and abroad to service Glovis India clientele. This quantity has to be pushed out of factory gates for domestic consumption as well as exports.

At times, Glovis India has to clear 90 containers daily at Chennai port for exports and imports, requiring services such as port management, customs clearance, freight forwarding and CFS. This is where tracing and tracking becomes important, he stresses.

What exactly has this project given to Glovis India? “We wanted vessel tracking on a map for easy display, auto refreshing of the screen every ten minutes, and the ability to generate reports via Excel files,” says Chakraborty. The system is also able to live stream vehicle movement across Indian roads, thanks to Trimble software.

The biggest takeaway of this project is the improved efficiency, adds Chakraborty. While Chennai port congestion remains an issue, the other operations have benefited from constant vigilance and quick action on the ground.

and google mapping,” he says. “A tremendous amount of value addition happens when the data are captured, analysed and integrated with the ERP platforms.”

Others agree that the volume and complexity in the supply chain require more automated processes for tracking. “How can you manage, manually hundreds of vehicles that ferry components, sub-assemblies and finished goods every day?” asks G Sudhir, chief operating officer of Goods Mover Technologies, which services several car carriers. “Don’t forget the psyche and illiteracy of truck drivers on whom the entire automotive industry depends either. Not having tracking is equal to committing suicide,” adds Sudhir.

Sanjiv Tripathi, chief operating officer of Mercurio Pallia Logistics, which uses Efkon for Maruti Suzuki outbound tracking and Goods Mover Technologies for non-Maruti clients, agrees that automated tracking is a must. “Manually managing 700 fleets constantly is humanly impossible. Besides assisting OEMs in tracking deliveries to dealer points, the data captured helps improved fleet management at our end,” he says.

Murali Thandavamurthy, country head for Swiss software provider U-Blox, sees a huge upside in the tracking and tracing mechanisms business, which he estimates will be worth $100m in India by 2018. However, he sees issues in the market, such as a lack of commitment on timeliness, poor pricing and a lack of expertise.

Others also think the market offerings in India are currently insufficient. Mukesh Haritash, joint managing director of Chetak Logistics, which has a fleet of 2,500 and a number of warehouses across manufacturing hubs, says track and trace is nightmarish. “We were not satisfied with their services in terms of getting the data points captured in the shortest possible time. Moreover, none of them were able to promise 100% capture and accuracy of positioning,” he says. In response his company has developed its own system.

**Communication breakdowns**

Beside specific tracking systems and approaches, automotive logistics in India is still in need of improvements in automated communication, such as EDI. Likewise, the markets for cloud computing and RFID seem to be fledgling, at best.

Electronic and automated data sharing via EDI and B2B protocols are in vogue but lack standardisation in India, confess both carmakers and service providers.
While many have their reservations about the efficacy of automated track and trace systems, G Sudhir of Goods Mover Technologies believes that to try to manually monitor a fleet of hundreds of trucks and their drivers would be ‘equal to committing suicide’.

“It is a challenge to communicate across supply chains using EDI and B2B protocols across India, as there are no standards followed in this industry, nor by different state governments, nor by customers,” says Shinde. “Almost every EDI has to be customised.”

For Fiat, automated communication works well for import and export cargo. The OEM is also using a tool for suppliers that works reasonably well. “However, standardisation of all these EDI and B2B protocols needs to be looked at. Accessibility is not an issue. Willingness and rolling out are key challenges,” says Pathak.

“Owning software is preferred over outsourcing. This mindset has to change for cloud to succeed,” says Atul Kaushal, chairman of Bangalore-based Oriento Solutions.

“We are not able to take advantage of cloud-based technology or platforms because the industry is so fragmented,” says Fiat’s Pathak. “Everyone uses their own software or solution packages, but there is a need for standardisation through collaboration among OEMs and suppliers to take advantage of technology. This is where I see the possibility of a 4PL stepping in.”

On the other hand, Vinay Prasad, director of product management and marketing for Telematics 4U, a Bangalore-based company that provides backend support for Goods Mover Technologies, is full of praise for a cloud platform. “We have built solutions for Mahindra Logistics’ interplant movements. The beauty is, this is integrated with customer’s ERP systems. We offer total supply chain visibility – Vinay Prasad, Telematics 4U”

According to Ceva Logistics’ Venu Nair, director of information systems for India, the country has traditionally relied on paper-based transactions, which he thinks will change as companies shift toward adopting web-based applications. “In keeping with our company’s policy of real-time connect with business partners, we use a communication platform called Ceva Matrix Connect to connect our business partners with the Ceva IT world,” he says.

Logistics isn’t yet walking on the cloud

Opinions also differ over cloud-based platforms, but many share concerns over their data integrity and security. “In this domain, cloud-based solutions have not surfaced even globally,” says Natarajan. “This could be because users in one vertical are concerned about information leaks to competition and the level of customisation sought by each user.”

Getting the most out of barcodes

The growth of RFID technology, meanwhile, appears to have been stunted because of its prohibitive cost, with barcodes still the preferred choice. Kaushal believes that India’s automotive volumes don’t yet justify the use of RFID.

Ceva’s Nair, points to applications outside the supply chain, including employee identification, retail outlets and asset tracking. He believes RFID will eventually be used more in areas like inventory control, yard management and vehicle
tracking. “With further development in technology yielding better memory capacities, faster processing times and longer reading ranges, RFID has the potential to become a lot more widely adopted across the industry,” he says.

Pathak says cost is still prohibitive for Fiat, although it has commenced the use of RFID in small doses for tracking and tracing at plant level. He believes the industry has not fully made the best use of barcode technology, let alone RFID. “Before exploring RFID, we need to leverage the untapped potential of barcode,” he says. “Maybe this competition with barcode will help give RFID adequate time to adjust its pricing point to the ‘comfortable levels’ of auto OEMs.”

**Who is willing to pay?**

The main issues when improving any tracking system are cost and return on investment. There are many differences in opinion when it comes to how willing carmakers in India are to pay for such services. “Nothing is free and what is being offered is not a cheap Chinese box, but a solutions package,” says ATIC Data System’s Ranjit. “Once the client is convinced of deliverables, pricing is not a challenge.”

Others believe that manufacturers are still in a learning phase. Telematics 4U’s Prasad says that some OEMs have been burned by previous systems. “Hence the hesitancy [to invest],” he says.

Natarajan at Trimble points out that most buyers in India want an oxymoron: a solution that is “cheap and the best”. However, he believes there is appreciation for technological superiority, which results in better pricing.

Oriiento’s Kaushal agrees that pricing depends on getting management to understand the value of data integration. Meanwhile, Bhavesh Solanki, handling international business development at Mumbai-based Softlink Global, a cloud-based provider, says clients are ready to invest in technology when they understand the benefits to resource utilisation.

Pricing is also impacted by the multiplicity of software players on the market. A basic vehicle tracking system is not a high-end technology anymore, so the barriers to entry are relatively low. However, not all players understand the complexity of the logistics business.

“Indian brainpower is tremendous and so providing tracking software is easy. Anyone can start. But is that all? What most of the suppliers lack is domain expertise to build a business solution, scalability and understanding of service support need. Otherwise, there are hundreds of GPS box sellers who are keen in dumping cheap GPS hardware on OEM’s laps” says Elkton’s Roy.

Kaushal says that some players are undercutting the market. “The unfortunate part is that these wannabes try to finance their working capital and in the bargain, drop prices steeply, thus creating an impression that other genuine and better players are overpricing,” he says.

“This industry has a revolving door with many entrants and quitters almost every month,” adds Natarajan. 

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**“PROVIDERS HAVE TO INVEST, NOT OEMS”**

At Fiat, most of our inbound cargo comes from nearby regions, and we have Free on Road (FOR) delivery terms. Therefore, we are not doing consolidation and optimisation of inbound movement because of locational advantage. Very few Indian companies – irrespective of verticals they operate in – have this concept of the ‘control tower/room’.

“Neither Maruti Suzuki nor Honda Cars use this [for inbound] because of the concentration of suppliers in their vicinity, and the FOR formula adopted. In the United States, manufacturing bases are concentrated and the supplier base is scattered. In India, it is a different story. With regard to imports, Fiat has a division called World Materials Flow (WMF), which tracks movements across the globe.

“The need for a control tower emanates from an OEM’s location and its supplier footprint. When you have your suppliers within ‘shouting distance’, the ability to respond to any critical moment is much better. Excessive tracking would therefore be wasteful. On the other hand, during my tenure at General Motors, suppliers were not always in reachable vicinity therefore be wasteful. On the other hand, during my tenure at General Motors, suppliers were not always in reachable vicinity and hence tracking used to be critical. There we had a service provider keeping a close watch or tracking and updating the movement of materials, to ensure production was not affected at any time.

“At Fiat, we nevertheless do a lot of data analytics. We have a supplier relationship management (SRM) tool wherein all suppliers are linked to our plant. Whenever a consignment leaves the factory gate of a supplier, this invoice is updated onto our portal and we know, more or less, the exact time of arrival of that consignment at our factory gate. Plus, these consignment-carrying drivers alert us on handhelds and mobiles, so there are no surprises.

“More than return on investment, what anyone will examine is the value addition in any tracking system. It does not always make sense for OEMs to invest directly in these mechanisms. Going forward, as the market grows, logistics providers such as 4PLs (fourth party logistics providers) should invest. OEMs, I believe, will not mind shelling out some recurring costs, but certainly not as an investment. This approach will surely help 4PLs, so that the viability of tracking and tracing is addressed positively.

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Trimble’s Ravindran Natarajan says an appreciation for technological quality, such as its on-board tracking devices, results in better pricing across the board.

Kalpesh Pathak,
Fiat India Automotive
India conference 1
India conference 2
India conference 3
India conference 4
‘Logistics will be more of a differentiator for Magna’

A
difficult European economy and increasing global competition in the automotive supply chain have not made things easy for Günther Apfalter since he became president of Magna Europe in late 2010. You might think that logistics would be a distant concern for a chief executive working in a stagnating market, but Apfalter lists it among his top priorities for Magna in Europe; he believes that it can make a real difference to the supplier’s bottom line.

“Logistics is certainly in our top five at Magna. It is one of the main ingredients of our daily operations,” he says. “This is a big cost portion on one side, but also a big opportunity for improvement.”

Apfalter is busy enough to not be involved in the day-to-day operations of procuring logistics or managing material flow. As one of Magna’s top executives, he works with the heads of the company’s multiple divisions in the region and across a network of more than 120 plants and around 30 engineering and development centres. The role of president at Magna Europe was created after the departure of Magna International co-chief executive officer Sigfried Wolf left the company with just one global CEO in Donald Walker. Apfalter has also been president of Magna Steyr since 2007, a group that builds vehicles in Graz, Austria and runs its own global supply chain for vehicle assembly and in areas such as roof, battery and fuel systems.

Despite these responsibilities, logistics is very important for Apfalter. In October, he made a special visit to the Magna Logistics Day, an event held in Leibnitz, Austria for internal logistics managers at Magna in Europe as well as for logistics providers.

Apfalter maintains that logistics at Magna is not just about moving material between suppliers and plants, but is crucial to the company’s organisational structure. Like other large tier one suppliers, Magna is a product of numerous acquisitions, mergers and restructurings over the years. The company, with its several divisions and more than 310 global plants, has a very decentralised management approach. So much so that Apfalter’s job as president for Magna Europe is actually

Who we spoke to:

Günther Apfalter, president, Magna Europe
Klaus Iffland, vice-president, purchasing and logistics, Magna International Europe

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p34 Magna’s complex structure
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parallel in many ways to his position as president of Magna Steyr. Logistics is part of what brings together many of the disparate parts of the organisation.

“Our decentralised culture has meant that logistics is playing more and more of a role at Magna,” Apfalter says. “Our European team is doing a great job in optimising the value stream between our partners, suppliers, customers and our plants.”

Apfalter says logistics helps Magna to act more like “a fleet of speed boats rather than a tanker” when it comes to adjusting its production or supporting customers, for example. He stresses that, with the supply chain so globally interconnected, logistics has even less room for failure, particularly during vehicle launches.

“[As president] you don’t watch logistics all the time, but if you have problems then it comes to the surface very quickly. If you’re missing parts during a launch and you have to fly them from Mexico to Japan, the costs just explode,” he says.

### Acting like a big company in the supply chain

Reactivity and flexibility are essential in today’s tier supply chain, but so too is a supplier’s ability to have scale in its operations and among its own supplier base. Klaus Iffland, vice-president of purchasing and logistics at Magna International Europe, says logistics is part of what allows the company to maintain its decentralised organisation, while at the same time acting “like a $30 billion company in the market”.

He points to in-house planning and sourcing tools that Magna uses in Europe to run effective tenders, design transport flows and determine the appropriate packaging for material. Many of these tools and operations are increasingly bundled together between Magna plants by Magna Logistics Europe (MLE), the group’s central logistics planning and purchasing team in Europe. MLE also works together with a steering committee made up of logistics directors from each of Magna’s groups. The organisation is unique for Magna globally in terms of combining more logistics flows and management across divisions. There is no such equivalent in the company’s North American operations, for example.

“This structure really allows us to work as a big company in Europe, where we bundle volumes and optimise services as one supplier rather than as 120 small-to-medium-sized companies,” says Iffland.

### Local advantages

Two years ago, Magna brought together logistics with purchasing in an effort to better understand total supply chain activities destined to his position as president of Magna Steyr. Logistics is part of what brings together many of the disparate parts of the organisation.

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#### MAGNA’S INNOVATION AWARDS

Logistics provider Kuehne and Nagel and compressor and valve supplier Ventrex Automotive were given innovation awards by Magna Logistics Europe (MLE) and Autocluster Styria (ACstyria), the network of more than 180 partner companies within the automotive industry in the Austrian state of Styria.

Kuehne and Nagel’s east European division was the top winner in the Process Innovation category for its logistics monitoring systems, while Ventrex won for its development of technology to regulate pressure in natural-gas-powered vehicles.

The awards were presented during the third annual Magna Logistics Day, held in Leibnitz, Austria, by Magna’s top management in European logistics and purchasing, including Jörg Blechinger, director of MLE, and Klaus Iffland, vice-president of purchasing and logistics for Magna International Europe.

The first awards of its kind for Magna, entrants were judged on the innovation of their submitted products, and not necessarily because Magna uses them.

Kuehne and Nagel, which has its eastern European division headquarters in Vienna, Austria, was commended for its increased visibility of logistics cost and reduction of total supply chain costs. The company established a control tower to monitor and manage all shipment flows, and also implemented a web-based transport order system for the supply base. The solution resulted in savings of around 15% in the supply chain.

Kuehne and Nagel is a significant logistics provider to Magna across Europe and Russia, including the consolidation of a large number of flows destined for Magna’s Russian plants at a crossdock in Chemnitz, in eastern Germany.

Rather than being specific to logistics, Ventrex’s award for technological innovation was pertinent to the overall reduction of pollutant emissions from vehicles. The company, based in Graz, Austria has developed a pressure regulator that uses mechatronic components to control the electronic gas pressure regulation in natural-gas-powered vehicles.

Günther Apfalter, president of Magna Europe, who spoke at the awards ceremony, pointed out that innovation among its logistics providers and technology suppliers was critical to Magna’s success in Europe. “The innovation coming out of Europe is part of what helps Magna be a forward-looking company,” he said, adding that the imperative to reduce carbon emissions was making logistics even more important to the automotive industry.

Klaus Iffland added that Magna was implementing ‘world class manufacturing’ principles across its production network, including the use of lean and just-in-time processes. “In working with our logistics providers, we are also striving for ‘world class logistics’ at Magna,” he said.

The Magna Logistics Days, held in October, drew more than 200 participants from across Magna International divisions in Europe and from the tier supplier’s logistics providers. The event featured exhibitions from a number of important providers to the company, including Kuehne and Nagel, Panalpina, Quehenberger, DB Schenker and Duvenbeck.
chain costs. While Iffland admits that material costs still tend to have a bigger influence on sourcing than does logistics, he says that having an accurate view of the total logistics cost can impact contract and operational decisions. “It’s very important for us to know the logistics implications, as well as for our customers [to understand our logistics cost],” he says.

Apfalter stresses that OEM customers ultimately drive Magna’s supply chain and production locations, and that logistics must react accordingly. “You have to be a globally acting supplier. When BMW is going to China, you have to be there and be localised to optimise the logistics chain,” he says.

“The advantage of Magna being a global company with 314 plants around the world is that we can follow these global customers,” adds Iffland. “We don’t need to ship parts around the world. We can transfer our knowledge from Europe to Asia or the other way around, easily and quickly.”

For Apfalter, logistics’ future role in this localisation will also become more significant. He believes that lowering CO₂ emissions and providing customers with more visibility about supply chain origins will become both a regulatory and operational requirement in the automotive supply chain.

“Logistics is going to be more and more of a differentiator, especially as we talk more and more about CO₂ emissions from ships, planes and trucks,” he says. “If I were a politician, I would award those companies that have excellent logistics and supply chains rather than those that haul equipment from one side of the globe to the other.”

Apfalter even foresees the day when car parts will have stickers showing supply location and emission generated in their delivery, similar to fruit labels in some countries today. “That will happen in automotive, too. Some progressive groups, such as BMW, are already looking in their supply chain for who is localised and who has the most optimised logistics and supply chain,” he says.

Strength in the European supply base

Despite the need to localise in growing markets, Apfalter is adamant that Magna’s European production and supply base will remain strong, particularly in Germany and Austria, where it has 49 and 17 plants, respectively. While he expects western European markets to remain saturated, the company’s production and supply chain here will continue as an important centre of volume, value and innovation, even as Magna invests further in markets like Russia, where the company now has five plants.

Magna International’s financial results, both in Europe and globally, have demonstrated this duality to some extent. According to the company’s third quarter financial report, core manufacturing regions in Central Europe and emerging ones to the east have driven a 12% increase in revenue in Europe to $7.3 billion during the first nine months of the year compared to 2012, and an 87% increase in earnings before interest and tax to $264m. The OEM production that the report credits with improving results in the region includes the BMW Mini Paceman, Mercedes-Benz A-Class and CLA-Class, Ford Transit and Kuga, Skoda Rapid and Seat Toledo. Analysing the location of these models reveals a mix between Germany and Austria – the Graz plant builds the Mini Paceman and has recently revamped its assembly line for the new Mercedes-Benz G-Class, for example – as well as the Czech Republic, Hungary, Turkey and Russia.

Globally, Magna has also benefited from its footprint, balancing sales in stagnating regions with those of growing ones and by combining premium and volume brands in its customer portfolio. In total, the company saw revenue grow 13% in the first nine months to $25.6 billion, with earnings up by nearly 15% to $1.45 billion (of which nearly $1.16 billion came from North America).

Despite the company’s relative strength in Europe, Apfalter does not deny that more growth will come from the east, both for Europe and globally. Magna’s global sales split is currently around 50% for North America, 40% for Europe and 10% for Asia. “However, the Asian car market will continue to grow over the course of the next years, and of course Magna will adjust itself,” he says.
Exploration of value
How logistics is unlocking competitive advantage across supply chains

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Growth... and other good problems to have

This year’s conference in Detroit revealed the challenges inherent in production growth and flagged up changes and disruptions that supply chain operators must accept, writes Christopher Ludwig

Speakers at this year’s Automotive Logistics Global conference had supply chain expansion on their minds. While uncertainties remain, many of the current issues facing the automotive logistics sector in North America are a result of growth, including high production run rates, global vehicle launches and changing supply flows, particularly in Mexico.

The US market continues to recover volume, with 2013 sales on pace to top 15m light vehicles, and expected to rise above 16m by 2015 and increase gradually for the rest of the decade. The US still faces economic risks – political deadlock, high unemployment and potential fallout in macro-economic policy. However, Michael Robinet, managing director of IHS Automotive Consulting, expects the industry to remain relatively “divorced” from such economic trends over the next two or three years, thanks to replacement demand, an improved housing market and a steady stream of new launches.

US light vehicle assembly has increased 89% from the 8.6m units during the trough of the crisis in 2009, according to IHS. Production in the US, Canada and Mexico should surpass 16.2m units in 2013, and rise further in the coming years to more than 17.4m in 2015 and above 18m units by 2018. Already, many plants in the region have reached their full production capacity, running on as many as three shifts per day, seven days a week.

“As production comes up to these levels, OEMs and tier suppliers will be thinking about adding bricks and mortar,” said Robinet. “They will need more factories to support this growth.”

Given the rising production, this year’s conference theme was ‘Made in America’. While logistics may not be at the heart of every supply chain change, analysts and industry players confirmed that there are shifts occurring, including the movement of some assembly from Asia to the US and especially to Mexico.

“We see more production from Japan and Korea moving to

Chris Styles (left) said that Nissan’s supply chain in Mexico was highly integrated with its production in the southern US states.
Mexico and also to the southern US states,” said Robinet. “We will soon see more European models coming over to North America out of the euro zone or South Africa to be closer to the final market.”

The shift toward North America could also been seen in sourcing some commodities and components relative to China and other low-cost countries. Peter H. Appel, director of transportation and logistics at consultants Alixpartners, said that Mexico and the US are approaching total cost parity with China after factoring in currency, manufacturing, labour and logistics costs.

“Wage inflation in China is growing faster than anywhere in the world,” he said. “When you take all the factors together, the China cost could reach parity with the US cost within a couple of years. Certainly Mexico and India are ahead of the game, but it is no longer a situation where you look at Chinese wage rates and it’s an automatic decision to go to China.”

**No one-size-fits-all supply chain**

However, sourcing in the supply chain resists definition. Even as there is localisation in North America, global platforms and more ‘co-location’ of model production across multiple markets have increased the exchange of material between continents as well as across North America.

“There is no one-size-fits-all supply chain,” said Dana McBrien, associate chief advisor at Honda of America. “In some cases we have seen parts manufacturing actually moving further away from our facilities, but we’ve also seen the US move into ‘low-cost country’ position, and we’ve nearly doubled our export of vehicles and parts from here in the last 15 months. You have to find the right mix.”

Grant Belanger, who recently returned to the US as executive director of global material planning and logistics at Ford, said that rising global production and increasing shifts towards global platforms and emerging markets would continue to disrupt the North American supply chain.

“We’re going to build cars, trucks and SUVs around the world and the growth in some regions is going to change the balance of your logistics channels,” he said. “The customer is going to pick the winner and losers and part of being picked is having the right product at the right time.”

Today, global platform production and model launches straddle a number of continents. In 2000, according to IHS, about 80% of vehicles built in North America were targeted only for the region. Today, the number is nearly reversed: 75% of North American vehicles are also built or shipped somewhere else, which leads to more complex, intercontinental supply chains, as well as more challenging launch schedules. Honda’s McBrien acknowledged that launches could lead to significant bottlenecks in the inbound supply chain if not properly coordinated.

“It stresses resources internal to the OEM, and you have whiplash back through the supply chain,” he said. “For every model, you launch many new parts for each supplier. You need a nimble organisation to redo the logistics network. It comes down to good planning and perfect execution. It has become cumbersome trying to keep up with launches from a logistics standpoint.”

This growth in both global launches and material coordination demonstrates how the supply chain story in North America today is not entirely one of re-shoring to the US and Mexico. Belanger emphasised that the focus for the sector is on getting the maximum use out of production assets. In some cases, double tooling isn’t the answer. “It’s a collection of solutions,” he says.

Robinet pointed out that while there was a trend to duplicate tooling in multiple locations, suppliers might push back against OEM demands to move closer to them or add more locations, as such moves would strain their own capital costs and economies of scale. “It could create a lot of inefficiencies in the supply chain,” he said.

**The Mexican wave surges**

Mexico is set to rival the major BRIC economies over the coming years in terms of increasing automotive assembly. According to IHS, Mexican production in the country’s central region alone will have risen from 1.5m units in 2010 to 3m by 2016 and 3.5m by the end of the decade.

For inbound and cross-border material flow, the growth has already started to pick up. Julie Krebbiel, executive vice-president of intermodal marketing and sales at rail and intermodal provider Pacer International, said intermodal rail crossings grew by about 20% between 2010 and 2012.

Scott Grady, senior vice-president of corporate sales solutions at Landstar, pointed to a rise in truck and especially rail border crossings in 2013. The ratio of material moving across the border by truck relative to rail has dropped from 70% in 2009 to about 60% today, he said.

Volume growth has come from both northbound and southbound flows. Mexico has seen a 15% growth in automotive suppliers this year that have added production, sub-assembly or distribution centres in the country,
according to Grady. In total, the automotive supply base is expected to grow 400% by 2020 as manufacturing increases.

The interconnectedness in the Mexican and NAFTA supply chain is particularly strong for production in the US southern states. “Our supply chain in Mexico and for our US plants is extremely integrated,” said Chris Styles, director of logistics for Nissan North America, which has two plants in Mexico and is set to launch a second plant in Aguascalientes.

**Bottlenecks and investment**

With the growth in Mexico has come a rise in bottlenecks, noted Grady. Border crossing times have risen by an average of more than 20 minutes during the last year, to 133 minutes. There are also concerns about capacity in ports and for rail.

However, speakers said that Mexico’s competitiveness for both manufacturing and logistics was strong, particularly when compared to other emerging markets. Bill Garrett, president of Vascor, pointed to good infrastructure and a skilled labour force. Styles said that Nissan’s Mexico plants ranked among the best in the world for efficiency as well as for supply chain and logistics performance.

Pacer’s Krehbiel pointed to a growth in automotive-specific intermodal offerings in Mexico, which have the advantage of tracking parts and giving them priority in loading and unloading. Glenn Donell, director of purchasing for transportation and tooling equipment for Faurecia Seating, backed up her point. The tier supplier, which has been growing in Mexico and across North America, has recently started working with Pacer to integrate flows between the US, Canada and Mexico.

Grady pointed out that although border crossing times have risen and customs can be complex, the fact that the border crossing can be measured in minutes rather than days is a testament to how much logistics has improved. Penske’s Hector Benavides, general manager of operations in Mexico, said the company could now cross the border in minutes. “It’s slower going north, but we get the documentation done in advance,” he said.

**Increasing frequency in aftermarket**

Carmakers noted a number of competitive factors that have forced them to change their aftermarket networks, including competition from independent distributors and growing part numbers. Larry Demski, department head for parts logistics at BMW North America, said BMW expected SKU growth of up to 35% in the coming years, which has been outstripping the capacity of the carmaker’s parts distribution centres. Anu Goel, vice-president of parts and vehicle logistics at the Volkswagen Group of America, said the carmaker expects its part numbers to more than double by 2018, from 201,000 to nearly 500,000. “Our systems are not currently set up for this increase. It’s one of our biggest challenges,” said Goel.

BMW has responded by rolling out multiple deliveries per day in its most concentrated markets. The carmaker has expanded its global network of 37 regional distribution centres (RDCs), including six in the US, with the addition of another 40 ‘dealer metropolitan distribution centres’ (DMDCs), five of which are in the US.

The DMDCs are smaller than a normal RDC and are positioned close to major markets. Their inventory is based on dealer orders, but typically represents medium-and-slower moving parts that dealers wouldn't ordinarily have in stock. Using non-branded Sprinter vans, orders are delivered by milkrun the same day, up to three times per day.

As well as having five ‘standalone’ dealer parts centres, BMW also uses its RDCs as ‘virtual DMDCs’ to serve nearby areas, giving dealers there access to nearly the entire BMW parts portfolio (except for heavier parts, like engines and transmissions, which Sprinter vans cannot carry). The vans make pickups and milkrun drops to dealers within the region, on top of BMW’s normal truck deliveries.

“The system helps to relieve the inventory at dealers, and greatly improve repair service,” said Demski. “We’re doing this Monday to Friday, and we are also testing a Saturday service.”

**Toyotas dealer drop-off points**

For the last two decades or so, Toyota has also run a multi-tier network for its spare parts, according to Thornton Oxnard, national manager for parts logistics planning at Toyota Motor Sales (TMS). Parts move from suppliers in the region, or from ports receiving parts from Japan, to a network of large, North American parts centres (called NAPOs), from where they move to more local distribution centres.

“The system works as a shock absorber. We had a port strike in Los Angeles, for example, but there were enough parts in the system that we avoided any disruption,” said Oxnard, who was one of the system’s architects when he worked for Toyota in Japan during the early 1990s.

About 80% of parts in the network are delivered to dealers unattended during the night; the damage-free ratio is 99.87%, while 99.94% are error-free; 98% ship on the same day of
the order. Toyota has also been moving towards a same-day service to supplement its two-tier distribution model, in which the carmaker chooses a designated drop point in a metropolitan area, from where Toyota dealers are responsible for the final transport. This allows some dealers two deliveries per day. “A dealer can place an order before 10am; the order is picked, packed, loaded, and the dealer can pick it up the same day,” said Oxnard. “It allows for the same-day completion of service work, reduces delays, loaner and rental expense.”

Change is a good thing
Conference participants were generally optimistic about the future, but while the market is expected to rise further, automotive logistics faces potential disruptions from a number of sources, including regulations such as fuel economy standards and hours-of-service rules for drivers. OEMs and providers also face more competition, whether from other brands, new technology, or from shifts in driving patterns and behaviour, such as car-sharing schemes.

Tesla Motors, whose premium electric vehicles have seen a growth in sales and interest, demonstrates how one company may bring further changes to the market and even to logistics. According to senior manager for logistics Mike Polich, Tesla’s internal technology means that all of its cars can be geo-fenced during transport, which helps with vehicle tracking.

Ford’s Grant Belanger looked at change in a broadly positive way, pointing out that the automotive industry has dealt with business disruptors throughout its history.

“You have to embrace change, because the customer will drive this for you anyway. If you take something like driverless cars, that could also mean there could be driverless trucks and trains, relieving us of driver shortages,” he said. “Car-sharing schemes could bring in many new services, in terms of serving customers at different points, with logistics accompanying that.

“I don’t see the changes as negative challenges,” he concluded. “They are opportunities to understand what else we can do for customers, and leverage logistics to deliver the vehicles, parts and services they want.”

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BMW’s only North American factory, located in Greer, South Carolina close to Spartanburg, has become one of its most important production centres anywhere in the world. Not only does it help meet fast-growing demand in the US and North American market, there is also global demand for the SUVs – or ‘Sport Activity Vehicles’, as BMW calls them – which are produced at the plant. The $2.2 billion assembly facility, which employs 8,000 people, is the only BMW plant producing the series X3 and X5 Sports Activity Vehicles and the X6 Sports Activity Coupe. Next year, the plant is also slated to start assembling the new X4, with a round of investment that will eventually increase capacity from 300,000 annual units to 350,000.

In 2012, the Spartanburg plant produced 301,500 vehicles and exported nearly 70% of them to around 150 countries, including large flows to China, Germany, the UK and elsewhere. With exports of around 211,000 vehicles totalling $7.4 billion in sales, BMW is one of the largest vehicle exporters by volume and value in the country. Production this year has been at a similar pace to that of 2012 through November.

With high volume expected to rise, and with an increasingly global and complex supply chain, logistics effectiveness has become even more important to BMW at Spartanburg, according to Marcus Wollens, vice-president of logistics planning for the BMW Group, who is based at the carmaker’s headquarters in Munich.

BMW, which has a closely integrated management structure for the Spartanburg plant and its central logistics and purchasing teams in Munich, has recently undertaken a number of initiatives to reduce logistics costs and the carbon footprint for production distribution at the plant. For example, the company has recently switched to lower cost rail transport for import drayage from its entry port in Charleston, South Carolina, and has also introduced a new inland container port that speeds up port transfers for imported material. Spartanburg is also the first plant to employ BMW’s new small parts warehousing concept to help improve velocity for its in-plant logistics.

To meet domestic and export demand for the SUVs it produces, BMW is introducing measures to reduce logistics cost and complexity at its Spartanburg plant, writes Anthony Coia.
For outbound logistics, the carmaker is also using rail to move its vehicles to the port of Charleston for global exports. It exports Mexico and Canada-bound vehicles from the port by short-sea ro-ro shipping.

**North American inbound network**

BMW sources or picks up most of the material for the Spartanburg plant in the US as part of a huge trucking network that involves more than 700 trucks per day. For the North America supply chain, Wollens says the company’s priorities are to maintain and improve the quality of its trucking providers in areas such as on-time delivery.

For US suppliers, the average distance to the Spartanburg plant is around 180 miles (290km). A large number of North American suppliers use full truckload (FTL) transport, especially for just-in-time (JIT), just-in-sequence (JIS) and a high volume of what BMW calls ‘direct montage and assembly’ parts (DIMO). The latter are parts delivered directly to the assembly area, but not in sequence and without a definite time stamp for use at the assembly line. Wollens says that JIT, JIS and DIMO parts account for about 80% of Spartanburg’s inbound volume.

Most of the remaining domestic and North American volume is consolidated through warehouses and distribution hubs before arriving at the assembly line. The consolidated logistics network also ships stock parts from across North America.

BMW Spartanburg receives about 740 trucks daily, which consist of 400 JIT/JIS, 300 bulk trucks and 40 sea containers. Its delivery frequency depends on the type of material. For example, JIS deliveries of parts such as seats or bumpers arrive hourly, while stock parts arrive as consolidated freight two or three times a week. Wollens emphasises that BMW aims for a high delivery frequency, but also wants to avoid air freight, which is why it consolidates its shipments. Wollens adds that by focusing on a high fill rate of more than 95%, with a reasonable delivery frequency, BMW can use more direct shipments and avoid using more milkruns.

Whether it ships by FTL or by consolidation centres, BMW uses various logistics providers for its inbound services. Such services include transport, but also route planning management and pick-up optimisation for the truck network. The carmaker’s inland port storage is also outsourced. However, BMW contracts directly with all of its logistics providers and does not use third party logistics providers to manage carriers, according to Christoph von Patow, head of logistics planning at BMW Spartanburg. Von Patow adds that BMW handles all its logistics functions with in-house staff, such as sequencing.

**Global supply chain management**

While the supply chain for the vehicles built at Spartanburg has a strong concentration in North America, a sizeable amount of content is also imported from international and

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**BMW’S NORTH AMERICAN INBOUND BY MODE**

- **Milkruns** (10%)
- **Consolidation** (7%)
- **Sea freight** (5%)
- **Air freight** (<1%)
- **Direct shipments** (78%)

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BMW's Spartanburg plant receives around 740 trucks daily from various providers, consisting of 400 JIT/JIS, 300 bulk loads and 40 sea containers.
intercontinental sources. In terms of supplier pickup locations, BMW sources more than 90% of its parts from the US, 5% from Europe, 3% from Mexico and 1% from others, such as Canada and China. However, the supply chain’s manufacturing origins reveal a more global mix, as a number of suppliers build their products in Asia and ship to local warehouses in the US. BMW considers these suppliers to be part of its US sourcing and Wollens and Von Patow maintain that such content ranks in the mid-single digits percentage-wise.

As BMW’s production and supplier network grows across the world, Wollens says managing cross-regional and intercontinental supply flows has become more complex. “External sourcing is becoming more globalised. This creates challenges not just with costs, but also with ensuring supplier competency,” he says. “In the past, BMW’s plants were mostly standalone. Now, they may produce as many as eight models per plant. This creates greater complexity and the need for a high degree of flexibility in manufacturing since it increases the number of parts needed line side.”

From Europe, BMW consolidates its material bound for Spartanburg in a variety of pick-up methods. For higher volume equipment, the carmaker uses the ‘sea direct’ method, in which ocean containers are loaded at single supplier locations and move by truck to the port of export. This method, used for commodities such as engines, currently accounts for about 37 containers per day. Small parts and lower volume shipments are picked up by milkrun at suppliers, consolidated into sea containers at a centre in Wackersdorf, then delivered by rail to the port of Bremerhaven, where they are loaded onto ocean carriers. The Wackersdorf consolidation centre currently ships about three containers per day, according to Wollens. The sea containers arrive at the port of Charleston, about 215 miles from the plant.

From Asia, in early 2013 BMW established a direct supply network for both sea and air freight which Wollens says means the Spartanburg plant is now fully integrated into BMW’s global sourcing network.

Wollens expects that the supply chain will become even more complex and globally diverse. “We are sourcing more overseas and from more countries. Our overseas sourcing of 5-7% used to be 99% from Europe and 1% from other countries. Now and as it evolves, our overseas sourcing is about 45% from Europe and 55% from Asia. We are sourcing small parts globally,” reveals Wollens.

**Switching to rail for inland flows**

BMW’s inbound logistics network in North America has recently undergone some significant improvements. Chief among them, in late 2013, was a plan to use rail transport for sea containers that arrive at Charleston. The carmaker switched from truck to rail to move the containers to a new customs-bonded, multi-user inland terminal in Greer. The terminal, which is in a designated Free Trade Zone, will handle all customs clearance for BMW’s container imports.

BMW currently reserves 700 container spaces at the Greer terminal. “Our main reason for using the new facility is to get sea containers off the road and store them in the lot. The idea is to maximise storage in the container – not in the plant – by keeping [material] off-site as long as possible,” explains Wollens. “From the Greer terminal, containers are delivered to a dock door either at the assembly area or the inbound logistics centre. The additional space that will become available will enable future growth and development of the Spartanburg plant.”

As well as saving space, BMW expects to achieve an

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**SERVING GLOBAL MARKETS**

As intricate as BMW’s inbound logistics network is, the **outbound logistics** system from Spartanburg also entails a complex global network, with exports to 150 countries worldwide, according to Mathias Wellbrock, general manager of vehicle dispatch and distribution for the BMW Group.

“Approximately 30% of our total volume [from Spartanburg] is destined for Europe and we export about 25% of our total volume to Asia. We export the rest of our overseas volume to South America and Oceania,” he says.

BMW generally expects to move about 20-30% of its production volume to the North American market, with more than 95% of this volume staying in the US. The deliveries to Canada and Mexico move on ro-ro ships.

From Spartanburg, BMW now moves about 70% of its finished vehicles by rail and 30% by truck, with most of the rail headed to the port of Charleston for export. The percentage of rail was relatively stable during the plant’s huge production increase, which has seen output rise from 123,000 units in 2009 to the latest figures of more than 300,000 units.

Among the OEM’s main outbound challenges are capacity peaks and the reallocation of vehicles that need to be covered by the transport provider’s capacity.

“The challenge is limited supplier investment in transport capacity,” says Wellbrock.
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overall cost reduction by storing its import containers at the Greer terminal and calling them out as JIT deliveries.

Wollens says that by the end of 2013, almost all imported containers were scheduled to move by rail, which will help the company reduce CO₂ emissions in transport. Only containers that are particularly urgent upon a vessel’s arrival in Charleston will move by truck. Wollens predicts that the latter should account for about 10% of the total. He adds that the Greer terminal will also make it easier for BMW to have visibility of its inbound logistics for receiving, storage, picking and delivery.

**Integrating plant and warehouse**

BMW’s warehousing strategy in the US is integrated with its IT protocol. Wollens says it uses SAP standards for its entire warehousing and delivery process, including automated call-offs from the assembly line, which trigger trailer call-offs from the yard to replenish stock. BMW’s SAP warehousing system manages all of its storage locations, captures all material and scans it to a defined location.

BMW receives the material, processes it to its defined storage type and location, then maintains it as SAP master data. Wollens says that, based on call-offs, the material is packed in the warehouse either in bulk, piece, or sequence and then handed over to a defined distribution point in the warehouse. Parts are scanned from the material train at the distribution point and then transported line side and scanned for delivery to the individual tact.

BMW relies on real-time tracking and tracing of its shipments. Its IT system provides updated tracking and tracing information as the sea container passes predefined checkpoints that are set up along the vessels’ routes through GPS and satellite signals. Truck drivers use mobile scanner devices on pallets, racks, and boxes to provide information about current activities. The pick-up list is updated with possible changes when the truck driver arrives at the supplier’s location.

Wollens notes that the driver can only scan and pick up
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the correct parts in the correct quantity. Each driver’s activity is transferred in real time to logistics providers and to BMW, which allows for an immediate reaction in case of a delay or error. The shipment’s ETA is updated automatically and an exception report is generated for the material planner if it exceeds predefined thresholds for standard processing time and safety lead times.

**Improving in-plant flows**

For its in-plant logistics, BMW has embraced the trend of using small boxes line side. “We are moving more toward designing how parts are delivered to the line side,” says Wollens. “Small boxes hold smaller parts. The concept is about carrying small boxes to the line side efficiently.”

BMW has created this system by implementing a new, fully automated small parts warehouse, which is a roughly 4,200 sq.m attachment to the plant’s existing logistics centre. Wollens says Spartanburg is the first BMW plant to use such a warehouse, which handles a flow of 700 boxes per hour.

“The key advantage of the small parts warehouse is that it reduces the number of manual handling steps from six to just two, thus creating a more efficient materials flow,” says Wollens. “In the entire small parts warehouse process, the boxes and parts are only touched twice – in the receiving process at the depalletising station, and when feeding the flow rack at the assembly line.”

Another of BMW’s objectives is to use just one storage location for each part number within the plant, which would minimise handling. From storage, BMW delivers the part directly line side and does not store it a second time, such as in the assembly area, for example. Furthermore, BMW wants to improve its packaging and labelling quality to avoid the need for repacking and re-labelling. Wollens points out that cardboard packaging from overseas tends to fall apart because of the humidity in sea containers or the lack of careful handling.

“Automated label scanning requires the labels to be in good shape, which is not always the case with overseas packaging,” he adds.

**Logistics evolution**

BMW is planning to implement a more efficient process for receiving trucks at its plant and a more transparent yard management system that uses RFID and GPS technology. “Within the next year, we will roll out SAP for yard management. At this point, part of our network still uses an old IT system, so we will integrate it more into the SAP system,” says Wollens.

“To be honest, some of our competitors are a bit more advanced in RFID,” admits Wollens.

BMW’s plans for automated data collection will facilitate its evaluation of logistics providers’ performance and their adherence to KPIs, which is something the carmaker monitors with vigour. The BMW logistics team provides regular reporting of its KPIs to the logistics providers, along with countermeasures and trend analysis to help them improve.

As it looks to the future, which will include the rollout of a new model in the plant and an increase in production capacity, BMW Spartanburg has plans for increased supply chain transparency that are geared toward improving both inbound and outbound velocity. The recent adaptation of a small box flow was an important step for its in-plant efficiency, while increasing multimodal transport at the same time as increasing JIT and JIS deliveries will increase the plant’s overall productivity. Logistics, it is clear, remains a major focus as BMW increases production for Spartanburg.

Spartanburg is the first BMW plant to use a fully automated small parts warehouse which can handle 700 boxes per hour and reduces touch frequency from six times to two, thereby creating a more efficient materials flow.
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Tier one suppliers in North America are facing both global and regional supply chain challenges. As vehicle production grows across the continent, particularly in the southern states of the US and Mexico, suppliers are reevaluating their own production and logistics flows to accommodate increased demand within wider and more complex networks. Many tier one suppliers have extended their reach beyond North America to serve the expansion of global production platforms and modular strategies among carmakers. To manage this growing complexity, some tier ones are relying more on advanced IT systems to increase their supply and network visibility, as well as the expertise of third party logistics providers.

Higher demand has meant capacity has generally been tighter in recent years in the North American supply chain, according to Dave Andrea, the Original Equipment Suppliers Association’s (OESA) senior vice-president of industry analysis and economics. Andrea says that although capacity shortages are not systemic, they exist in pockets among some commodities and processes. The result, he says, has been more pressure on managing a tier supplier’s inbound and outbound logistics. “Since the industry is running lean, with lower inventory, it increases pressure on logistics for just-in-time (JIT) deliveries,” he says.

“We need logistics improvements across the board for two primary reasons,” he adds. “One is that new production programme launches add volatility to the supply chain and the other is to handle incremental volume increases.”

Jim Barnett, vice-president of the automotive sector for the Americas at Ceva Logistics, points out that, particularly since the financial crisis, OEMs and tier one suppliers have reduced their breakeven point for production in North America, but assembly and output has since recovered to reach record levels, despite only a few new plants being added. A good number of plants and OEMs have switched to three-shift production, for example, and there have been some constraints in supply and logistics.

“Everyone wants to get the maximum production without adding bricks and mortar or permanent staffing,” he says. “This has resulted in a rationalised footprint for the automotive industry in North America that is massively more efficient than it was five years ago. At the same time, volume increases have resulted in capacity constraints.”

As production grows, carmakers and tier suppliers are once again investing in factories, however. Andrea points out that the greatest amount of new capacity will emerge in central Mexico, where by 2017, about a quarter of all North American vehicle production will be located. “Two-thirds of the suppliers that we surveyed plan to add incremental capacity in Mexico,” he says.
Barnett adds that tier one suppliers are also moving southward so as to better match their production footprints to the development of new transplant OEMs in Mexico and the American southeast; many are also doing so to take advantage of lower labour costs.

Despite these shifts, it should be noted that production has risen strongly among Detroit-based manufacturers in plants from the Midwest to Texas. According to Barnett, there is a need for creative solutions to support tier one suppliers that are working three shifts and maximising production. Perhaps more than ever before, suppliers need more pan-North American strategies, which extend beyond one part of the country and include both localisation in certain regions, as well as cross shipping between locations.

Shape shifting in North America
Shape Corporation is among the tier one suppliers that is increasingly developing such a broad logistics strategy. A manufacturer of bumper beams and related products based in Grand Haven, Michigan, Shape has seven plants in the state. It has also begun pre-production, including the final weld and application of E-Kote, a black rustproof paint, at a plant in Texas that serves General Motors’ Arlington plant, which it currently ships to from Michigan. “We will begin operations and truck takes six days,” he says. “We balance the need for JIT deliveries with the cost per pound.”

The use of transport mode depends on the volume of a product and the distance it will move, says Wickering. He says a trend toward aluminium bumpers has led Shape to combine more steel with aluminium or plastic to get the most density out of both the weight and volume of its loads.

Total cost considerations at Draexlmaier
Another tier one supplier that has an increasingly integrated North American logistics strategy is Draexlmaier Automotive of America, a German supplier with two divisions in North America. For its electrical segment, Draexlmaier has one plant in Nicaragua and four in Mexico. A distribution centre located in Duncan, South Carolina, serves BMW’s Spartanburg plant. The firm’s interior section has a plant in San Luis Potosi in central Mexico and one in Duncan, while it also shares the distribution centre in Duncan with its electrical segment. In San Luis Potosi and in Duncan, Draexlmaier maintains two off-site inbound warehouses, which manage the delivery of material into the production cells.

Heiko Laessig, senior manager for logistics, says Draexlmaier’s Interior Segment has made a significant effort to localise its supplier base, with about 90% of its suppliers at the end of December when GM introduces its new model,” says Kevin Wickering, logistics manager of purchasing.

Shape also has a plant in Mexico, in the north-central state of Queretaro, which mostly supplies car production in Mexico. For this plant, Shape’s transport modes include truckload, less than truckload, intermodal, 18.3-metre boxcars and flatbed trucks. A majority of flows in Mexico move by intermodal and boxcar rail. Wickering notes that four semi-trailer loads fit in one boxcar, which makes the mode quite efficient by weight despite its longer lead times.

Within the US, Shape ships by intermodal and boxcar methods, except to GM’s Arlington plant, where it uses trucks, flatbeds and intermodal transport. Movements from the US to Mexico also include intermodal flows. “A 60ft boxcar takes 18-19 days to reach Mexico, while intermodal takes ten days local in North America for both segments. The remaining 10% of material comes from Europe and Asia. On the electrical side of the business, Draexlmaier still receives 60-70% of its raw materials from Europe.

Laessig says Draexlmaier works carefully to evaluate the total cost of the network by taking space and investment restrictions into consideration. The supply chain must balance these factors as well as the need for fast-moving flows. “In our strategic planning process, we make sure that long lead time elements such as infrastructure, big machines, etc. are available,” he says. “For short-term changes, we have created some mechanisms to flex our capacity. For example, our inbound warehouses are off-site and we also negotiate a set price with our logistics service providers.”

Flexibility in response to capacity crunches
The production growth in North America has tested both Shape and Draexlmaier’s logistics networks. Wickering says that Shape has seen capacity issues spike in the last six months of 2013 and the company’s expectations are that the situation will worsen in 2014. The supplier has looked to a number of ways to help buffer these capacity issues, including outsourced warehouse and off-site locations.

“Our current challenge is to maintain sufficient manufacturing space,” says Wickering. “We need space for inventory control, work-in-progress material between

Who we spoke to:

Dave Andrea, senior vice-president, industry analysis and economics, Original Equipment Suppliers Association (OESA)

Jim Barnett, vice-president, automotive sector, Americas, Ceva Logistics

Kevin Wickering, logistics manager, Shape Corporation

Heiko Laessig, senior manager, logistics, Draexlmaier Automotive of America

Rich Grant, director of strategic clients, east coast region, Seko Logistics

The automotive industry in North America is massively more efficient than five years ago, but volume increases have resulted in capacity constraints – Jim Barnett, Ceva Logistics

[Image of a person]
plants, finished goods material and empty returnable containers,” he says. “Thus, we have opened warehouses where we lease space to manage our finished goods inventory and containers.”

Shape also uses warehousing in which its logistics providers do the material handling, which frees up space at its own plants and warehouses. “At these facilities, we have invested in scanning devices and wireless capacity for our own terminal. This makes sense since manufacturing space is much more expensive than warehousing space,” he adds.

As production demand increases, Draexlmaier is watching developments in the trucking industry and the growing business in Mexico carefully. “The rising average age of truck drivers is a big concern to us. This is likely to lead to an increase in truck prices,” says Laessig. “In order to deal with this, we have developed strategic relationships for key lanes with asset-based carriers.”

Mexico, as mentioned, is among the locations where production has grown most, and where supply and logistics capacity is expected to be the most strained. Laessig points out that Mexico is attracting more and more industries and companies, while the logistical infrastructure is not growing at the same proportion, resulting in longer times for border crossings. As a result, Draexlmaier is developing alternative modes and is using less-congested routes to cross the border.

Our current challenge is to maintain sufficient manufacturing space... thus, we have opened warehouses where we lease space to manage our finished goods inventory and containers

– Kevin Wickering, Shape Corporation

The company has also developed innovative packaging designs that have reduced its expenses substantially, he says. “In particular, packaging for interior leather products is very sensitive. Yet, a higher pack density reduces transportation costs and handling costs. We have saved between $12m-$15m.” Barnett says that customers are consistently asking Ceva Logistics to be more flexible in its operations because of both complexity and capacity issues in the supply chain. “Because of their length and complexity, supply chains are much more fragile today than they have been in the past,” he says. “As we have seen in recent years, natural disasters can have a huge impact on suppliers’ and OEMs’ supply chain and bottom line performance, and we need to respond better.”

Localising with global production platforms

Another factor influencing tier suppliers’ logistics networks in North America is the expansion of global production platforms. Wickering points out that General Motors uses shared platforms with different variations for North America, Europe, and lower cost countries. Some components are unique to each region, while some are common to all, depending on evaluations of what GM calls ‘total enterprise cost’, including logistics, capital, tooling, labour, duties, tariffs, taxes and trade agreements, as well as supply chain risk. Shape is also using such considerations in its production and sourcing decisions.

“In the past, we produced it all here [North America] and exported it,” says Wickering. “Now, we must have a local presence [in global markets]. In the past year, we have added [facilities or suppliers] that are more localised to the customers in order to do the finished work.”

Wickering says that in China, Shape is a supplier of the last component. It serves a Toyota plant that is located about 12 hours from Shape’s production facility. “Although our steel bumper beams pack densely and weight out, the bracket attached to the beams causes us to lose pack density,” he explains. “Therefore, if the logistics costs become high or the distance is long, we want a manufacturing partner to provide stamping or E-Kote that is closer to the customer.”

Not every tier supplier has seen global platforms alter its logistics strategies, however. Laessig says that Draexlmaier provides a significant amount of sequenced content. Since most of its parts are individual to each car line, he does not see a big change. “However, for some parts, our customers direct us to choose certain non-localised suppliers, which is in line with the OEM’s global platform strategy. These include doors and centre consoles, which differ per car line,” he says.

Barnett adds that Ceva has seen many operations move from a domestic focus towards supporting programmes for exporting and importing vehicles and parts that make up a global platform. “More of our customers are asking us for a complete supply chain solution,” he says. Ceva has responded to these demands with solutions such as the Ceva Matrix platform, which allows global visibility of inventory levels.
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**IT developments**

In some cases, global platforms have led to greater demand either for sophisticated IT systems or for 3PLs with stronger IT specialisation. For example, Shape exports 10% of its products overseas, material which the company is looking for a 3PL to provide more visibility over ocean exports, according to Wickerin. “Here, IT capacity is a bigger part of the equation. With a transit time of three to five weeks, the ability to provide visibility distinguishes 3PLs,” he states.

The rising average age of truck drivers is a big concern to us. This is likely to lead to an increase in truck prices [so] we have developed strategic relationships for key lanes with asset-based carriers – Heiko Laessig, Draexlmaier

Shape began working with global 3PL Seko Logistics this year. “We can use Seko’s web-based system as our own for shipment documentation and customs clearance. It offers a lot of flexibility and interactive capabilities,” says Wickerin.

Another of Shape’s challenges has been the need for new yard management technology. Wickerin says that its extra warehouses created a lot more in-transit product between its plants and warehouses as well as more inter-plant shuttles.

On average, Shape has 70 trailers moving between seven or eight plants, using 125 docks. Shape's use of YardView yard management software enables the driver and dispatcher to see which trailer is in which dock. The driver uses an electronic tablet to record their shipment as delivered and then receives instructions to their next stop. “This will save us money by requiring fewer trucks and drivers,” explains Wickerin.

At Draexlmaier, Laessig says all of its facilities operate within the same IT landscape, which links inventory and production to the tier supplier’s trucking providers. In general, Draexlmaier develops in-house all of its systems that interface with customers; Laessig says this approach helps to guarantee adaptability to customers' needs. However, he sees scope for the company to develop or purchase more advanced systems or transport routing and optimisation.

**A merging logistics landscape**

Another factor influencing logistics network design is the continuation of mergers and acquisitions among tier suppliers, a process that accelerated during the economic downturn and has continued in many areas. As a result of these mergers, a number of the leading tier one suppliers have gravitated toward decentralised purchasing and logistics systems.

“...The trend, however, is toward more centralisation for direct materials as well as indirect purchases,” says Andrea. “It is about balancing local expertise and flexibility to scale and efficiency driven by centralisation.”

There are advantages to decentralised logistics networks as well. At Seko Logistics, Rich Grant, director of strategic clients for the east coast region, warns that a centralised logistics network can risk losing local and historical intelligence. Decentralised approaches, which give more flexibility and control to individual plants or divisions within a supplier, tend to focus more on performance and are often able to react fast to problems or changes in manufacturing and supply.

Grant also observes that there have recently been more mergers and acquisitions among tier two and three suppliers than among tier ones. He has also observed changes in the high-tech sector, which has seen more partnerships among companies as well as more localisation. “We are seeing more joint ventures between technology providers and tier one suppliers, including branding with Microsoft and Sysco. There has been more near-sourcing in high-tech to get closer to the customers,” he says.

Barnett says that merger and acquisition activity has had some major impacts for Ceva Logistics, mainly as a result of its customers' merger strategies. He notes that the supply chain department is often responsible for delivering some of the expected cost savings through synergies in operations.

Ceva's first task is to help that group achieve savings as soon as possible, he says. Some areas where that might need to happen include combining existing logistics networks to gain synergies and expand the services and systems scope to include better visibility and control. Barnett says that this involves unifying customer processes and touch points across operating divisions. It also entails re-pricing the entire network to take advantage of increased volumes.

Mergers and consolidations, together with shifting geographies and global demand, continue to influence North American tier suppliers. As the continent sees both growth and new supply flows, there is little question that such complexity for the suppliers’ supply chain will also continue to change their logistics, sometimes dramatically.
Informing, networking and doing business - globally and regionally

Breaking down barriers in the global automotive supply chain

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An industry on the advance

In China’s complex automotive landscape, logistics is crucial, but OEMs and 3PLs still face a steep learning curve on which they can help each other, writes Christopher Ludwig

China’s vehicle sales and production growth has been explosive for much of the past decade, booming nearly tenfold between 2001 and 2010. When the rate of expansion slowed in 2011 and 2012 to the low single digits, officials and economists suggested it was part of a wider shift in the Chinese economy, one geared towards stability, service and consumption rather than investment and government-stimulated growth. Leading logistics companies and supply chain managers in the country echoed this, emphasising that stable growth meant China could improve on its high logistics costs by adding more value-added services and multimodal transport.

By any standard but its own, however, China’s growth has again risen high, if not completely taken off. Sales and production are up close to 15% for 2013, with passenger car growth particularly strong. Some carmakers, such as Ford, have seen sales rise by 50% or more. IHS Automotive expects the year’s passenger and light commercial vehicle production to approach 20.5m and rise at a healthy clip for several years, surpassing 30m units by 2020. The government’s official outlook is even rosier, with China’s State Information Consultancy Centre predicting ten more years of 10% annual sales and production growth.

Investments in capacity show no signs of slowing down, as new plants come online across China’s major and emerging industrial centres. The Volkswagen Group is opening seven plants by 2018, including the new factories it added this autumn for FAW-VW in Foshan, south of Guangzhou and for Shanghai VW (SVW) in Ningbo near Shanghai, and in the far western city of Urumqi. In 2015, SVW will open a new factory in Changsha, in the central province of Hunan. GM will open four new plants by 2015, including a Shanghai-GM plant to build Cadillac vehicles in Shanghai. In Changshu, near Shanghai, new carmaker Qoros recently started production, while Chery Jaguar Land Rover will come online there in 2014. In Chengdu, southeast China, cars are now rolling off the line for Geely-owned Volvo Cars, while a second plant in Daqing in the northeast will go live in 2014. Changan Ford is adding a third factory to its base in Chongqing, in central China. Finally, Renault has just received approval to form a joint venture with Dongfeng, Nissan’s partner in China.

Despite all the investment, IHS sees a low risk of overcapacity, at least among most of China’s joint venture OEMs. Volkswagen aims to have production capacity for 4m vehicles in China by 2018; IHS sees the carmaker’s sales and production hitting that level by 2020. Japanese OEMs may still take several years to recover following a political spat with China, while the outlook for homegrown Chinese brands is somewhat less certain. However, most global players in China look set to ride the rising tide. Some are already warning that logistics capacity might struggle to keep up with demand.

Learning the language of reform
So is there a gap between the aims of the central government to rebalance China’s economy and the tremendous expansion of the automotive industry? Officials still talk very much about automotive logistics in the context of ‘development’.
Cai Jin, vice-president of the China Federation of Logistics and Purchasing (CFLP), speaking at a recent conference on automotive logistics in Xiamen, used language drawn from China’s current five-year plan, stressing the need for reform, stability, innovation and the balancing of supply and demand. “The speed of China’s economy should be generalised in one word: stability,” he said. “We need to press down on excess capacity to achieve stable development. Automotive logistics should enter the era of quality instead of quantity.”

Talk of reform has accelerated following the so-called ‘Third Plenum’ conference in Beijing in November. The government set out to make a raft of economic changes, from liberalising finance and credit to cleaning up state-owned enterprises. Today, the words echoing out of Beijing from party members to middle management are that the market will now play a ‘decisive’ rather than a ‘basic’ role in allocating economic resources. The reforms themselves could indeed be significant for automotive logistics, from currency appreciation to plans to open up inland borders, but only time will show how and if they are actually implemented.

When it comes to improving logistics efficiency more immediately, any visit to leading carmakers and logistics providers in the country reveals that, whether by design or competitive necessity, supply chain management in China has become much more sophisticated – and has already advanced beyond the words of officials.

**The era of complexity and innovation begins**

For starters, China’s automotive growth has not only been about volume. Although Chinese local brands have grown this year, most have lost market share to higher value, foreign brands. Those foreign carmakers have integrated China firmly into their global production and supply networks, if not put it at the centre. The Ford models built today in China, for example, are global products that share platforms and components across multiple continents. Volkswagen has recently introduced its MQB platform in China, which includes models like the new Golf, on which it expects to produce millions of vehicles.

For GM, China has become the lead development market of Buick, for which some models share production with the US or may even be exported there, according to IHS’s Boni Sa, manager of China light vehicle production forecasting.

“We expect that the next generation of Buick products, such as the Regal, which have been developed by SGM, could be exported to the US,” he says.

Producing global products makes the supply chain more complex, often requiring co-ordination across continents where suppliers have not localised, or to respond quickly to material constraints. Such products also allow more standard processes for material flow, packaging, in-plant logistics and assembly line processes. Both Volkswagen’s new FAW-VW plant in Foshan and its SVW plant in Ningbo have been built and designed with the group’s global processes and standards in mind. That includes more uniform containers, automated guided vehicles and IT within the plant, while for inbound logistics it includes more inbound material consolidation and standard parts handling processes in logistics centres and warehouses.

The amount of new production, plants and even new brands in China is also giving automotive logistics the opportunity to introduce innovations. SVW’s plant in Ningbo has a large supplier park at which suppliers and providers carry out a range of production and logistics activities. Qoros has implemented a supplier park close to its plant in collaboration with the local government in Changshu, which has helped suppliers perform operations like sequencing as well as to lower their investment risk.

“We have two areas designated for suppliers, one which is provided by the local government, and the other where suppliers have primarily bought the land,” says Paulina Chmielarz, Qoros’s senior manager of logistics planning.
“Where suppliers have made a larger investment in manufacturing, they usually choose to invest in the land directly, while suppliers with operations like sequencing may prefer to have less risk by using the land from the local government.”

In terms of other innovations, Qoros has also introduced a higher proportion of kitting than most other plants. According to Mike Dickinson, director of order management and logistics, such kitting will allow manufacturing to swap models and frequency on the line very quickly. It also requires fewer assembly line workers, according to Chmielarz.

Although Qoros is currently only producing one model, it plans to launch a second next year and hopes to add more as the plant moves towards its 300,000 unit annual capacity. Dickinson believes the kitting will help the plant to be highly flexible. “The kitting makes manufacturing changes invisible to assembly line workers,” says Dickinson. “Most OEMs have a manifest on the hood of a car coming down the line with 35-40 parts on it. For Qoros, we have five. The reason is that there is no need for manufacturing to check the parts since they have already been verified during the kitting.”

### Supply chain design

Carmakers in China have made other advances, including more focus on logistics engineering and supply chain design. Sources at one major joint venture say the carmaker has taken over more direct responsibility for inbound deliveries (which is relatively rare in China, where tier suppliers arrange the supply chain to match the manufacturing processes in the plant. “We wanted complete engineering of the supply chain for every single delivery,” says Chmielarz. “We were then able to have much more raw data, which allowed us to then go back to the plant and re-engineer. We didn’t want to have any break in between the plant and the inbound logistics.”

This planning is particularly important for Qoros because it has chosen, similar to many other OEMs in China, to source parts on delivered terms, with suppliers arranging transport to the plant. However, the PFEF data establishes a full specification for inbound, including what truck type and mode, frequency, pallet and container should be used. Such specifications are also updated and changed regularly to respond to production and supply changes, says Chmielarz.

Dickinson says the decision to contract the supply chain this way was a matter of resources as the carmaker launched its plant. Given the proximity of the supply base, he says the company decided that taking control of inbound transport was not a main priority. “We do plan to change that, and I

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### Kitting makes manufacturing changes invisible to assembly line workers...there is no need to check the parts since [logistics] has already verified them – Mike Dickinson, Qoros

most transport to OEM assembly lines), leading it to invest further in tools and skills for better designing transport and consolidation flows, rather than relying purely on its logistics provider. As has also been seen in North America and Europe, there appears to be a trend among some OEMs in China towards centralising logistics routing and engineering.

Qoros, in launching its greenfield plant, has taken a highly integrated approach to logistics engineering and planning, manufacturing and sourcing. As a result, the shape of the carmaker’s supply chain, in which about 50% of suppliers are located within 300km of the plant, is no accident.

“We have worked closely with all suppliers in negotiating their locations and delivery parameters,” says Chmielarz. “In cases where a supplier was in Shanghai, we might determine that there won’t be a warehouse in Changshu. Some suppliers are far away or abroad, but often that was because we didn’t want to have a new manufacturing location for an off-the-shelf part.”

“Purchasing doesn’t source unless we [logistics] agree,” adds Dickinson. “We do the ‘plan for every part’ (PFEF) data together with material purchasing.”

Qoros’s logistics planning team also worked to engineer think that down the road we can look at adding an inbound arm for transport and containerisation, but we’re not there yet,” he says.

### Are 3PLs keeping up?

One area often cited as needing development in China is its third party logistics market. Here, the prevalence of in-house logistics providers, most owned by state-owned Chinese automotive brands, has set China apart from other major automotive markets. These companies serve not only their owners’ operations, but their joint ventures too, often in JVs themselves (the largest example being SAIC’s Anji with Ceva).

Executives acknowledge these companies do have some gaps in expertise, equipment and technology. The in-house model also leads to some political sensitivity in the automotive logistics market, with some OEMs bound to in-house providers for particular plants. Transport networks are arguably not as efficiently run as they might be under independent 3PLs or in a truly open market.

However, the logistics processes among these providers have become more sophisticated, including a high level of value-added services, from parts supermarket
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management to line feeding. SVW outsourced its in-plant logistics and parts inventory management to Anji-Ceva a decade ago, and the provider has grown to perform these services for a number of OEMs outside the SAIC umbrella.

Ford, meanwhile, has been working with Changan's provider CMAL (a joint venture with APL Logistics), to help it to play more of a 'lead logistics provider' role, similar to how the carmaker works with Penske in the US or DHL in Europe.

While China's automotive logistics market may not be entirely open, the pace of expansion has led to opportunities for private and foreign companies in China. Sources say that OEMs such as SVW, SGM, FAW-VW and Changan Ford are all expanding faster than their providers can keep up with, which has lead to an increase in the use of subcontracting. In a sign that the logistics market may genuinely be falling behind automotive growth, sources say that some OEMs are considering bringing more competencies back in-house, such as warehouse and in-plant functions. However, the in-house model at state-owned companies means that making wider changes can be difficult for carmakers.

Looking for a shared vision
Qoros provides an interesting example of how providers in China may be struggling to keep up with the industry's changes. According to Dickinson, Qoros put out a tender last year with the intention of outsourcing its warehousing, material flow and in-plant logistics. However, for him it was important that any 3PL (the bid went out to Chinese, joint-venture and global providers) would be willing to work closely with Qoros on new processes. “We have developed an idea of how we want to run our business and we were looking for more flexibility on the exact terms and conditions,” he says.

The first challenge for the young carmaker was that it was an unknown player, with current volumes low and uncertain. Dickinson admits that, for the larger providers, Qoros would initially be a “rounding error” in their business. However, he felt the real issue was that providers had a set idea of how they would run logistics. “It was challenging for providers to accept that we wanted to do things differently, and it was hard for us to accept that this spirit of co-operation wasn’t there,” he says.

“All of the big traditional players turned their back on us.”

Qoros eventually decided to keep this business in-house, which Chmielarz says has been an advantage for the carmaker in developing its own processes, including the high level of kitting.

“We didn’t want to give up on our idea of how we wanted to structure inbound logistics,” she says. “We still work with a lot of companies on the engineering, but that has been in very established frames of work. Until now, we are still searching for partners who share our vision of what the supply chain might eventually look like.”

Export potential
Vehicle exports are an area in which the logistics industry has held great hope, but whose growth and development has certainly been far behind that of the domestic market. That could change as a few global OEMs use China as an export base along with more traditional exporters like Chery, Geely and Great Wall. GM has said it would increase exports to 300,000 units over the next few years. Most of these cars, such as the low-cost Buick Sail, will go to emerging markets, but some vehicles may go to the US. Volvo Cars has also recently suggested that it could export from China. Qoros has already started exporting in small volume to select markets in Europe.

Qoros has introduced a high proportion of kitting to allow it to swap models and frequency on the line very quickly and minimise assembly line staff. While it is currently only producing one model, it plans to launch a second next year as the plant moves towards its 300,000 unit annual capacity.
The outlook is uncertain for many China-based exporters, however. While overseas vehicle and knockdown kit shipments surpassed 1m units in 2012, they fell in 2013 as some important markets faced instability (particularly in the Middle East) or erected further trade barriers, such as in Brazil and Ukraine. Aside from market conditions, exports are an area in which logistics needs further development and investment, including services for knockdown kits and spare parts logistics.

Jenny Jin, vice-president with responsibility for supply chain at Geely International Corporation (GIC) notes a strong trend towards semi-knockdown and complete knockdown kits (SKD/CKD) as countries change their import duty rules. Whereas in 2012 Geely’s export mix was nearly 70% finished vehicles, in 2013 that shifted to a 50-50 split between vehicles and kits for Geely’s 120,000 exports. GIC logistics manager Prince Chen expects that trend towards kits to continue.

Important CKD markets for Geely include Russia, Belarus and Egypt and the company has also recently invested in a CKD operation in Uruguay.

According to Jin, Geely uses a third party provider to do the packing and consolidation of CKD parts, which is managed by Geely’s plants, but connected to GIC’s systems. Jin notes that there are challenges sometimes in maintaining effective packaging, stacking and handling over the kits’ longer supply chains, especially overseas. “Stacking parts correctly is very important, especially because of the very poor road conditions in some markets,” she says. “In general we see better quality in markets where we use rail.”

Jin says that Geely tends to have the best quality in markets where it has invested in its own facilities and sales companies, such as in Belarus and Uruguay, where it can implement and oversee its own processes more strongly.

Long lead times for spare parts

The balance between investment and price is equally true for Geely and other Chinese carmakers when it comes to aftermarket logistics and spare parts networks. According to Chen, Geely uses one parts distribution centre in Shanghai to serve its global markets. About 50% of parts move by sea and 50% by air.

Like other OEMs in China, Geely faces long lead times in dispatching parts. For 2014, it has been able to reduce the time between receiving orders and the parts leaving Chinese ports, but it still takes several weeks. Including transit time overseas, spare parts delivery can stretch to nearly two months.

However, Jin and Chen agree that an overseas distribution centre is not necessarily the right move yet, although Geely continues to do feasibility studies. “If you have over-investment, then the customers will get the part sooner, but at partly seen in the export market. Officials and executives are right to call for reform and development.

However, if redressing skills and expertise shortages is necessary for improvement, China’s potential remains high. At Geely, for example, Jenny Jin says the company has begun to work more carefully with Volvo Cars on CKD processes, as the carmaker’s new Chinese plants have a variety of knockdown operations for parts arriving from Europe. “We are trying to get closer to Volvo’s systems and to learn from them, as they are globally tested and effective. We are already communicating very closely, and we will make regular visits to share information and to check operations,” she says.

Such sharing should be part of the next phase of China’s development in automotive logistics. Besides the ownership links between Geely and Volvo, China’s automotive landscape is a web of interconnected OEMs and joint ventures. Recently, sources say that there has been more communication between the various companies and joint ventures. That would not only be an advantage, particularly as production and supply networks strengthen, but arguably it is necessary given the rising complexity of the supply chain in China. To borrow some words from the government, in the next phase logistics could be decisive for the automotive industry.

OEMs in China are expanding at such a rate that some logistics providers have struggled to keep up, and carmakers are bringing some functions such as in-plant logistics back in house a higher price, which our customers may not be ready to pay yet,” says Jin.

A decisive role for logistics

China’s automotive logistics industry is far from perfect. Aside from the infrastructure gaps and lack of services such as intermodal, experts point to low productivity, high labour turnover and a shortage of skilled management staff. There is an aggressive, perhaps damaging focus on price, which can be

Stacking parts correctly is very important, especially because of the very poor road conditions in some markets. In general we see better quality in markets where we use rail – Jenny Jin, GIC
### Southeast Asian countries are intensifying their logistics networks to accommodate growth in sales and exports, writes Anthony Coia

Additional reporting by Marcus Williams

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**Gaining power through diversity**

As automotive production rises in the Asia-Pacific region, Southeast Asia has emerged as a frontrunner in assembly, export and sales growth in a number of markets. The ten-member Association of Southeast Asia Nations (ASEAN) is perhaps the most important trade bloc in Asia, representing a population of more than 600m across (from largest to smallest) Indonesia, the Philippines, Vietnam, Thailand, Myanmar, Malaysia, Cambodia, Laos, Singapore and Brunei. The average annual growth in vehicle production for the region is forecast to be about 8% over the next five years.

Regulations that mandate certain levels of local content and manufacturing are prevalent in the ASEAN region, making production and supply chain structures more complex; Thailand currently has at least 16 joint venture automotive manufacturers, for example, while Indonesia, which produces fewer than half as many vehicles, has 20. However, plans to lower more trade barriers and add more free trade agreements could unlock potential within the ASEAN trade bloc, as well as with important neighbours such as China and India.

Despite this potential, the region suffers from an underdeveloped supply base in some countries, along with limits in infrastructure and poor IT communication. Logistics as a percentage of overall cost is high across ASEAN – more than 15% in Thailand and 13% in Indonesia – compared to Japan, for example (a country in which the region is competing for production volume). For example, Ilhami Arslanoglu, vice-president of automotive, Asia Pacific at DHL Customer Solutions and Innovation, points out that urban and rural areas are not connected sufficiently by road across the region. Thailand’s production is in the south, but serving the north means crossing hilly terrain. Congestion is also a big factor in Bangkok and Jakarta.

**Thailand takes the lead**

Thailand is the region’s automotive powerhouse, selling and producing more than 2.4m cars and commercial vehicles per year. Indonesian vehicle sales and production were expected to top 1.2m vehicles in 2013, while Malaysian sales were expected to rise 6% to

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more than 660,000 units, while its vehicle production could approach 600,000.

“During the past decade, Thailand became the production hub of Southeast Asia,” says Rinaldy Sudyatmiko, senior director automotive Asia and Europe at APL Logistics.

Toyota, Honda, General Motors have increased production across the region, particularly in Thailand, despite the disasters of 2011 and sporadic and severe flooding from July to October 2013. The country is also a significant export hub, especially for Japanese OEMs. Mitsubishi exported 230,000 vehicles from Thailand in 2012 (compared to 303,000 from Japan), with major flows to other Southeast Asian nations, but also to Europe, the Middle East, Australia and New Zealand (see Finished Vehicle Logistics p16 for more).

While Thailand is currently king of sales and exports, DHL’s İlhami Arslanoglu predicts that Indonesia will close the gap at least for sales, given the rising middle class in its population of 240m. “It will happen, but when is a bit uncertain,” he says.

Several new plants are planned in Indonesia, including Geely in 2015 and Volkswagen and Mitsubishi in 2017. Other manufacturers are expanding their capacity; GM reopened a plant in the country earlier this year, while Toyota is building a new engine plant to serve local and global vehicle assembly.

Thailand’s parts network
Third party logistics providers have built strong networks in the region, with Thailand again in the lead. TNT Express Worldwide provides storage, fulfilment, express shipping and just-in-time delivery of automotive parts in Thailand, and also has networks in Malaysia, Vietnam, and Singapore. Managing director Alan Miu says 30% of its transport is by road and 70% is by air, which reflects the strong demand for expedited services. TNT Express operates 14 nationwide depots, drop-points and hubs in major cities in Thailand.

Beside Thailand, TNT operates its own B747 all-cargo aircraft in Singapore, Shanghai, and Hong Kong, and a day-definite road transport service in Singapore, Malaysia, Thailand, Cambodia, Vietnam and southern China. In the past five years, TNT has invested more than €8m ($10.8m) in the development of road networks, according to Miu.

DHL provides inbound and aftermarket services in Indonesia, Thailand, and the Philippines, domestic aftermarket for most other countries as well as ocean and air transport. Arslanoglu says it was recently awarded a contract with a European truckmaker’s joint venture near Bangkok to handle inbound logistics at its plant, including receiving, storage, and packaging. Up to now it has been providing aftermarket transport for this manufacturer.

“A few months ago, we also acquired and expanded milkrun services for a major carmaker in Thailand,” adds Arslanoglu.

In Indonesia, DHL began handling inbound shipments from port to plant in 2012. For the aftermarket, it handles international shipments to local parts centres. “For example, for several German OEMs, we ship by air from Germany to regional facilities in Malaysia and Thailand. We also serve another European truck manufacturer from a distribution centre in Singapore,” explains Arslanoglu.

At Ceva Logistics, Robert Strain, vice-president automotive for Asia Pacific, says approximately 75% of its automotive business in Southeast Asia is managing contract logistics, including warehousing and distribution services. He adds that Ceva’s automotive network is the most developed in Thailand and is growing rapidly in Malaysia and Indonesia. Ceva also offers in-plant services, a range of aftermarket storage and distribution and vehicle logistics services, including PDI, yard management and delivery.

Rinaldy Sudyatmiko says that 80% of APL Logistics’ parts shipments in the region are for production and 20% are aftersales – mainly inbound milkruns from the supplier to the warehouse. Domestic shipments are 60% of its automotive business, which is primarily by truck, and international shipments account for 40%.

By deep sea, APL ships mostly from Thailand and also Singapore, Indonesia, Malaysia, the Philippines, and a small amount from Vietnam.

“Forde and Mitsubishi are our anchor customers in Thailand,” says Sudyatmiko. APL also provides warehousing, sequencing, and crossdocking via the port of Laem Chabang, south of Bangkok.

Nissan operates a global production hub at its plant in Bangna, near Bangkok, Thailand, which is the Japanese

Helping Typhoon Victims
Southeast Asia is an area vulnerable to extreme weather events, most recently seen in the devastating impact typhoon Haiyan had on the central region of the Philippines when it hit land on November 8th last year. Automotive manufacturing and logistics was largely unaffected, being centred more than 500km to the north around Manila, but carmakers and logistics providers were quick to respond with humanitarian aid in the form of donations, the provision of vehicles and other resources.

Agility, Maersk, TNT Express and UPS were among those to offer warehousing, transport and logistics support to ensure that critical relief supplies reached those affected. All four companies make up the Logistics Emergency Teams (LETs), a cross-company partnership that supports humanitarian relief efforts during natural disasters.
carmaker’s global source for pickup trucks. From Thailand, it exported around 120,000 finished vehicles to more than 100 countries in 2012; 20% of these exports were to Asia and Oceania. Nissan’s largest export destination from Thailand was Japan, followed by Australia and the Middle East, according to spokesman Shiro Nagai. Nissan also produces in Indonesia, Malaysia, Vietnam and the Philippines; most of the major markets are served domestically and the logistics process is not as sophisticated as markets such as Australia, Hong Kong, and Singapore, admits Nagai.

To optimise automotive supply chains in Southeast Asia, we have integrated what used to be independently contracted and managed [networks] by facilitating standardisation of KPIs and service levels – Robert Strain, Ceva Logistics

Nissan’s plants in Indonesia and Thailand are seeing strong demand for vehicle logistics services in the region. The carmaker hopes to sell 500,000 vehicles in ASEAN by 2016.

In 2013, volume fluctuations in the region have made it more difficult to secure transport capacity, Nagai says. Nissan expects upcoming ASEAN Economic Community regulation changes to have significant impacts on its logistics efficiency, allowing it to move goods more freely throughout the region.

APL Logistics began providing vehicle deliveries from OEMs to dealerships in Indonesia. Sudyatmiko points out that the country’s vehicle production is only in the Jakarta area in west-central Indonesia, but there is a lot of inter-island traffic; the situation is the same for the Philippines.

The company launched its Auto Direct Service in October 2012 using Trans-Rak International’s car racking system in 40ft sea containers, which hold four cars. The containers ship door-to-door from plants in the Jakarta area to eastern Indonesia. “We are just starting to see flows from Jakarta to Menado in north-central Indonesia. About 80% of our Trans-Rak vehicles go to Indonesia and the others move from Thailand to Malaysia by land,” says Sudyatmiko.

Within Southeast Asia, 70% of APL’s vehicle shipments move by water and 30% by land. This reflects the unique geography of the region, as the two largest countries by population, Indonesia and the Philippines, are each composed of thousands of islands. The provider currently ships finished vehicles in Trans-Rak containers to Thailand, Vietnam, Indonesia, and Laos. For the latter, it ships from the port of Yantai, China to Bangkok and then by truck to Vientiane, the capital and largest market in Laos. In 2014, APL plans to ship 4,000 units from Malaysia to Thailand.

Network integration and trade policy
Ceva’s Robert Strain says there is a trend to integrate supply networks more in Southeast Asia. Thailand has the most complex and developed supplier footprint, he says. Indonesia and Malaysia, although highly regulated on local content, depend on imported content, and are expected to use more material from other ASEAN countries following further free trade agreements.

Aftersales logistics in Southeast Asia is also quickly moving toward an integrated model, with few or no single country models. Strain says that finished vehicle logistics networks are the last bastion to integrate, thanks largely to their dependency on government oversight. For example, the use of haulaway equipment varies from country to country and may be affected by governmental regulations.

“In order to optimise automotive supply chains in Southeast Asia, we have integrated what used to be independently contracted and managed [networks] by facilitating standardisation of KPIs and service levels,” says Strain.

Sudyatmiko says APL Logistics has been integrating its automotive services within Southeast Asia with respect to seamless door-to-door service, including customs clearance and last mile delivery. It is working more in the customs clearance area and finding options for maintaining good service levels. “For example, if a customer wants more domestic tier one suppliers, we try to set up milkruns,” says Sudyatmiko.

“However, the region has a long way to go. Thailand has a strategy, but Indonesia is a distant second because it imports many parts. The number of suppliers there are one-third to one-fourth the number in Thailand. We need more physical integration as well as information technology,” he explains.

Indonesia may eventually emerge as the region’s primary market, which would further change ASEAN logistics
networks. Indonesia has recently benefitted from inflows of investment, with Honda, Volkswagen, Suzuki, and GM building new plants and others, such as Nissan and Toyota, expanding their capacity. Sudyatmiko says the main challenge is infrastructure, since road capacity is limited. Jakarta’s port handling capability is also an issue since it is very congested.

TNT Express’s Alan Miu points to other difficulties besides infrastructure, including high customs fees, particularly in Thailand. As a means to address issues such as high customs fees, the ASEAN Economic Community (AEC) is the most comprehensive effort to drive trade integration for the region. Strain says this is a positive development for the logistics sector and provides opportunities for Ceva to develop cross-border services.

Malaysia poised to advance
Perhaps the most complex regulatory environment is currently Malaysia’s, which experts say has been a big drag on the country’s supply chain potential. Although Malaysia hosts 11 vehicle assemblers, the industry is highly protected, with domestic Protona and Proton brands capturing 30.1% and 22.5% of the market share, respectively. Malaysia has eliminated most tariffs for ASEAN countries, but high excise duties and taxes on cars and components restrict foreign manufacturers, and make production in the country among the most expensive worldwide.

“Protectionism is reducing Malaysia’s long-term competitiveness,” says Dr. Javad Feizabadi, assistant professor, director of academic research at the Malaysia Institute for Supply Chain Innovation. Malaysia’s logistics costs represent 3.6% of total sales, which is lower than Thailand but still relatively expensive. High taxes and duties drive costs higher. Feizabadi points out that with full implementation of the ASEAN Economic Community (AEC) in 2015, many inter-country tariffs will be eliminated, however, enabling opportunities for logistics efficiency improvements. Malaysia’s implementation of free trade agreements with Australia, New Zealand, Chile, and Japan should also bolster its automotive trade, he says.

Feizabadi says that Malaysia expects to expand its role as an export hub for serving neighbouring countries such as Indonesia and China. The import market is also likely to grow as Malaysia’s government brings the industry in line with its ASEAN counterparts, but it will struggle to retain some protective measures.

“By opening up the AEC, the automotive supply chain will become longer, which implies higher supply chain costs for transportation and storage costs, although production costs are likely to decrease due to a larger scale of production and larger pool of potential car buyers,” says Feizabadi.

As its logistics infrastructure develops, Malaysia’s role as a transshipment hub is also growing, thanks to the country’s location. In 2012, transshipment accounted for 22.5% of its total sea cargo throughput. The road and inland waterway sectors play a major role in Malaysia’s logistics network, while rail offers a freight connection between Malaysia and Thailand. However, Feizabadi says that, even with its multimodal transport options, Malaysia’s logistics system is weak, inefficient and fragmented. Port congestion is a major problem even before an expected rise in trade.

“The main challenge for Malaysia’s automotive supply chain after AEC implementation is to increase the importance of time and place value for the customer; delivery efficiency will become one of the main concerns of the market,” he says.

Looking further ahead
Another country that is on the rise is Vietnam, which has a low-cost production base and is expected to reach 50% growth by 2018. The country’s underdeveloped supply chain has restricted vehicle production growth, although a slow turnaround is taking place with investment from major brands such as Bosch and Akebono Brake. Malaysian Tan Chong Motor Group recently opened a plant in Da Nang.

The Philippines receives a relatively small vehicle volume, which may make it difficult to justify another plant, but on the positive side, the country is expected to reach 50% growth by 2018 (although the long-term impact of the recent, devastating typhoon is uncertain).

Perhaps one of the more surprising developments has been in Burma, known officially as Myanmar. Nissan is building the country’s first car plant for $75m. APL Logistics also ships a small quantity of 500 cars from Thailand, while Ford has opened dealerships in the country. These developments signal a slow opening of the country to the outside world. With Myanmar opening up, there is also an opportunity to link Malaysia and Thailand to India and China by road. Sudyatmiko says that although Thailand has a head start here, Malaysia could also expand its export markets and supply base, particularly for serving Indonesia.

The diversity of countries in Southeast Asia has played a strong role in determining automotive logistics networks; even if there is now a push to connect these services better, taxes and regulation have still driven costs higher. With upcoming changes designed to foster trade competitiveness, as well as a push to improve infrastructure and logistics services, the countries have opportunities to develop more competitive supply chains as a group.
In an assembly plant somewhere in Detroit, there’s something going on that, according to conventional automotive industry custom and practice, shouldn’t be. A semi-automated arm is reaching into a crate and pulling out steering arms shipped from China, ready for installation on the assembly line.

The big no-no? The packaging in question is expendable, single-use cardboard. Carefully designed so as to enable the semi-automated arm to pick up the components as easily as possible, the switch to expendable packaging is credited with delivering a $3m saving.

It’s a move that’s emblematic of some counter winds that continue to blow through the automotive industry. As far back as the dark recessionary days of 2009, a one-day AIAG conference on reusable packaging heard that the need to make cost savings was prompting a re-think of the virtues of returnable packaging.

“All bets are off,” summed up a report of the event. “According to participants from Ford and Chrysler, each part is now analysed on its own merits and if cost savings cannot be identified by moving to reusable packaging – especially for low-volume or globally-sourced components – then they can now be delivered to the line in disposable packaging.”

So, has the industry been back-pedalling from a ‘no expendables, no exceptions’ mantra? Although the preference is still towards returnables, several trends are tipping the balance towards expendable, at least for certain flows, or often in combination with returnable packaging. Not just in logistics parks or crossdocks, where the components inside will be unpacked, then re-packed into returnable containers for the short leg to the assembly lines. Some experts see efficiencies in moving expendable packaging all the way to the line, which would strip out the added cost of the unpacking and re-packing operations.

While the long-term protection and efficiency benefits of multi-use packaging make it a clear winner in many ways, expendable has a niche. What’s important, say industry insiders, is that manufacturers are flexible, and consider all their options when engineering a packaging system.

Returnable reasoning
The automotive industry’s traditional antipathy towards expendable packaging going line side is rooted in three, well-grounded axioms – one to do with cost, one to do with quality, and one to do with operational efficiency.

From the cost perspective, says Camille Chism, supply chain packaging engineer at Johnson Controls and a former packaging engineer at Chrysler, there’s no denying that in an industry striving to be lean and low-cost, the use of throw-away packaging represents an obvious waste. From the point...
of view of the overall supply chain, it’s a waste of resources. Compared to reusable containers such as totes, a decision to use expendable packaging means the supply chain is buying something, using it once, then throwing it away. Secondly, she adds, expendable packaging consumes labour and organisational resource. Instead of returnable containers simply being subsumed – almost for free – within the reverse leg of the logistics flows that delivered the inbound parts to the line, an extra outbound material flow is introduced, requiring people and equipment to handle it.

In terms of quality, cardboard generates a lot of dust, says Rodney Salmon, European commercial director at Macro Plastics. Accordingly, automotive manufacturers prefer to keep cardboard packaging out of their plants to avoid the possibility of dust and contamination that can affect sensitive electronics, powertrains and vehicle finishes.

Finally, returnable packaging in the form of plastic and metal totes and stillages is generally considered to be more ergonomically efficient for presenting components to the line, points out Chism. Expendable packaging, on the other hand, tends to be multi-purpose and, if made of cardboard, may lack the integral strength to support components of any weight in a particular orientation.

It’s easy to see why returnable packaging holds such sway within the industry. It has considerable longevity, is built with line-side efficiency in mind, presents fewer contamination problems, and ‘piggyback’s on the existing reverse logistics flow to return to source at minimal cost.

One-way packaging ticket for long-haul journeys
Anyone who has worked in container management and done the maths of missing or damaged containers, knows that managing returnable loops is not always easy. For some supply chain flows, it’s just not suitable at all.

“The general rule is: the longer the logistics leg, the less practical it is to return returnable containers,” notes packaging expert Felix Meyer-Horn, a former chief executive at packaging firm Groupe Dusogat, and now chief executive at advisors Damorin. “Look at most returnable packaging in the automotive industry; you’ll see it circulating around very short loops. Try and do the same thing in respect of parts sourced from China, and it won’t work.”

The distance imposes much less certainty as to when – or even if – those returnable containers will return. Equally, the time taken to ship containers over the distance involved means that automotive companies must invest in building a considerable fleet of returnable packing, to cater for all the containers on the ocean at any one point in time. Finally, the assumption of a low-cost or free return leg doesn’t hold: while freight costs to China are relatively cheap, that isn’t the case in respect of freight routes from China.

“The length of the supply chain is a key determinant of the choice of packaging,” agrees Ian Milne, business development manager at expendable packaging specialists IPS Lando. “The further away you are as a supplier, the less comfortable you will be relying on returnable packaging that is exposed to all the costs and risks of shipping returnable packaging back from North America or Europe.”

When you’re putting lots of small parts in a box – 150 to 200, say – then there’s not enough scale to make returnable packaging a worthwhile option – Dan Roovers, Orbis

Those costs and risk don’t just apply to trans-ocean distance, adds China-based Milne. Look at logistics flows occurring within China or within other emerging markets; and the quality and nature of the transport infrastructure between customer and supplier can also predispose trading relationships toward expendable packaging, especially when considerable distances separate customer and supplier.

Finally, not all automotive trading relationships actually have a return leg, which is an obvious problem for returning containers, as there won’t be a ‘free’ reverse logistics leg to piggyback upon. Examples of such one-way automotive trading relationships include complete knockdown kits (CKD), as well as spare parts, especially those sent over long distances, or to emerging markets.

“It’s the issues that the industry has with returnable packaging that make the case for expendable packaging,” sums up Richard Wilding, professor of supply chain strategy at Cranfield University School of Management. “The more problems you have with returnable packaging, the more you’ll go for expendable. It’s not just the cost of return transport versus the cost of disposal, there’s also the cost of managing the whole returns process to be factored-in.”

Flexible design
While the arguments in favour of returnable packaging are compelling over shorter distances and simpler trading relationships, they’re far from universally applicable. In an industry undergoing a considerable process of globalisation, those exceptions aren’t going to go away any time soon.

However, the arguments in favour of expendable packaging aren’t simply that it’s a cheap alternative to returnable
Packaging in those instances where returnable packaging presents problems. Duncan Murcott, sales and marketing director at IPS Lando, points out that compared to standard returnable totes and containers, the use of expendable packaging can sometimes make it easier to maximise the cubic utilisation of known cubic spaces such as shipping containers and trucks.

In other words, he says, a level of cubic utilisation that would be acceptable over short domestic logistics legs could well be regarded as unacceptably expensive if a decision was made to source the components in question from overseas. If purpose-constructed packaging is being designed to suit the needs of particular components and logistics flow, he says, it makes sense to design the packaging so as to optimise multiple parameters, not just cubic utilisation.

“In such cases, our goal is to design packaging so as to minimise total cost,” Murcott explains. “It’s about maximising the cubic utilisation, minimising damage, minimising re-packing, choosing the right material, then reducing the production and handling cost when placing components into packaging and taking them out. It’s generally the taking out that is regarded as the most important, as it’s the automotive vehicle manufacturers themselves who are doing it.”

In the case of smaller components, expendable packaging also finds a ready niche, say packaging experts. “When you’re putting lots of small parts in a box – 150 to 200, say – then there’s not enough scale to make returnable packaging a worthwhile option,” says Dan Roovers, vice-president of automotive sales at specialist packaging manufacturer Orbis, where automotive industry sales account for around half the company’s revenues. “In that situation, shipping in expendable packaging might make sense.”

Hybrid packaging solutions

Similarly, the growing use of pooled returnable packaging, with packaging fleets operated by specialist such as Macro Plastics, Chep, and Surgere, creates a niche for expendable interior dunnage to hold and protect components within standard-sized returnable totes and boxes, he adds.

Die-cut corrugated plastic dividers, moulded foam and sewn fabric bags also have their places as interior dunnage, says Roovers, and can easily be reused. However, the more difficult it becomes to organise that return, the more likely it is that manufacturers will combine pooled returnable outer containers with expendable interior dunnage, with the dunnage in question being either plastic or cardboard.

Wood, too, has a role to play, says Damorin’s Meyer-Horn. Not only are there instances of wood displacing plastic in automotive use (as a renewable resource, wood is greener than plastic, he points out), but it also has several other advantages over the materials conventionally used for returnable packaging, such as steel and plastics.

“Wooden packaging can easily be dismantled and repaired, and while cheap, is sturdy enough to use as frames for heavy items, such as engines and gearboxes – and also then be able to fit in other things around that frame,” he notes. “What’s more, wood can easily be combined with other forms of expendable packaging, such as cardboard, to form a combined solution that can be readily dismantled for recycling.”

Indeed, he adds, wood’s low-tech characteristics make it easily adaptable to other purposes, especially in emerging markets.

“Here in Europe, we assume that wooden one-way packaging will be crushed or dismantled at its destination,” he points out. “We don’t think of it being adapted by low-cost labour, but look closely and you’ll see examples of one-way wooden packaging being repurposed in just this way. In Brazil, for instance, I’ve seen wooden packaging used for one-way CKD shipments being adapted to form returnable packaging for spare parts distribution.”

It’s precisely such flexible thinking that the automotive industry needs when evaluating returnable versus expendable packaging, says Tim Nickel, vice-president of operations at packaging management specialist Surgere.

“Too many automotive companies have a standard packaging specification, which they view as gold, and from which they won’t and don’t deviate, even when they should,” he says. “Routinely, the industry is bringing in components in expendable packaging and repacking them into returnable containers deemed suitable for line side. Instead, they should be saying: can we design expendable packaging that is actually suitable for line side? That would mean components don’t need to be repacked in a warehouse or crossdock a mile away.

“Having a standard is great; the trick is in knowing when to deviate from it,” he said.

Nickel, a former global manager of packaging engineering at Visteon, gives the example of when the supplier switched from using a 40ft containers to import interior components from China, to a ‘high-cube’ container. Moving to a hybrid solution involving custom-made expendable cardboard packaging saved several million dollars a year.

“The cost of shipping the individual container was higher, but with custom-sized expendable packaging it was possible to achieve a higher packing density, thereby delivering a lower per-piece cost,” he says. “But you don’t see such opportunities unless you look at the total cost – the cost of the packaging material, labour cost, transportation cost, and storage cost. Aggregate to a total baseline cost, then look at what you can do to drive that baseline lower.”
next issue
The last mile

Adding value to growth

Logistics will be a crucial differentiator as competition in China increases, writes Christopher Ludwig

There is a new wave of factory openings across China. While the joint ventures for the Volkswagen Group and General Motors are the most aggressive, with plans to increase annual production capacity to 4m and 5m units respectively, others who have or will soon open plants include Ford, Nissan, PSA, Hyundai, Jaguar Land Rover, Volvo and newcomer Qoros. The government has also recently approved Renault’s joint venture with Dongfeng.

Following two years of low growth, sales have climbed 13% in 2013 compared to 2012, with passenger cars up 18%. IHS Automotive expects light vehicle sales and production of 30m a year by 2020; the China State Information Centre has predicted passenger cars alone will be 27m units by that time. With these expectations, such investment may not be too ambitious. Wang Zeng, senior analyst at IHS, identified Fiat as one of the few foreign OEMs who may face overcapacity.

However, China’s local carmakers still have up to 10m annual units worth of unused capacity, and continue to lose market share. Their production is tied closely to state finances, with municipalities either owning OEMs or priming private factories with incentives. Consolidating this overcapacity is a central government target, while foreign or private investment in the plants could even be an outcome of recent reform pledges, but such changes will be politically sensitive.

Wang believes stronger Chinese brands will play an important part in the future too, particularly as they close technology gaps. Great Wall’s SUV sales are up close to 30% in 2013. Long-term joint ventures should also help SAIC develop more upmarket vehicles, as should Geely’s ownership of Volvo.

Logistics will factor heavily in all this growth. Competition is putting pressure on prices in China, while land, labour and material costs increase. Efficiency at every level of production and distribution is essential for local and JV factories. SVW’s new factory in Ningbo, south of Shanghai, for example, features a large supplier park that will increase just-in-sequence deliveries and improve inbound consolidation.

Production and sales are also moving beyond the east coast. Volkswagen’s ‘Go South’ and ‘Go West’ strategies include factories in the southern provinces of Guangdong and Hunan, and in the central-west city of Chengdu (where Volvo’s factory is) in Sichuan province. SVW has also opened a knockdown kit plant in the far western Xinjiang province. GM is opening factories in central China in Wuhan and Chongqing. Such extended production networks require longer logistics routes, more multimodal transport and increased focus on supply chain engineering.

There will be increased pressure to shorten lead times, particularly for spare parts distribution. Vehicles sold during China’s massive sales boom of 2009-2010 are coming to the end of warranties, increasing aftermarket demand. The recent introduction of the ‘3R’ regulations (repair, replace or return) also mandates spare parts availability for new vehicles. If OEMs are to compete with independent distributors in China, they will need to develop the dense, fast-moving parts networks prevalent in Europe or the US.

There are also intangible factors for the supply chain; concern over pollution is rising faster than sales and China’s strict environmental rules could further restrict driving (not to mention trucks) in cities, impacting car use and logistics.

While most forecasts trace an upward arc for China, there are alternatives mooted. Perhaps the most extreme comes from Christian Hohenberger, a well-known futurist in the German-speaking world, who sees China’s central government collapsing and the country breaking apart into 20 separate states by 2025. “We see signs that China’s provinces are becoming more important and this could lead to a breakup,” he said at an event held by Magna Logistics Europe in Austria.

That may seem improbable given China’s ancient history and its rise as a world power, but this is a country with more economic and cultural divisions than a single-party system can always unify, while its population is getting rich enough to want improvements. Economic reforms, particularly those targeting corruption at state-owned enterprises, have partly been aimed at ensuring social stability, but more radical changes, as well as widescale resistance, cannot be ruled out.

Such risks are a long way off logistics, but given the scale of investment, any disruption could lead to significant whiplash. Carmakers have already planned more flexibility, including quick adjustment of output or swapping models on the assembly line. The supply chain must be able to react in sync, adjusting delivery frequency and routing, while communicating order changes up and down stream. Responding to growth as well as change must be part of the next phase of China’s development. ☛
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