

AUTOLOGISTICS EUROPE 2005 REPORT

This year's conference, in the stunning setting of the Montreux Palace Hotel, was even bigger than last year's event, with 226 delegates attending – an increase of nearly 60. It kicked off with a lively cocktail reception, sponsored by Panalpina, which everyone used to start the networking process.

The first day saw presentations from senior executives in the automotive industry and highlights included: Kazumi Nakada's blistering tour of the application of the Toyota Production System to Delphi; a presentation from Karl May at BMW about building the Leipzig plant to order for



The luxurious Montreux Palace Hotel was the setting for this year's conference

logistics processes; Johannes Fritzen from VW Transport on avoiding transportation; and Bruno Sidler, CEO of Panalpina, on the role of LSPs. The busy day ended with a cocktail reception and Gala Dinner at the historic Alcazar Theatre in Montreux.

Following the success of the strategy last year, the second day of the conference was again divided into two separate streams, enabling those attending to get the most out of the expertise on offer. The special Finished Vehicles forum in the smaller

of the two conference rooms excited some lively debate and the packaging and service parts sessions highlighted some pretty fundamental issues that need to be tackled by logistics providers and OEMs.

Our thanks go to all the sponsors who assisted *Automotive Logistics* in making this year's event memorable – G-Log, the Flanders Foreign Investment Office, Panalpina and P&O Nedlloyd Logistics.

If you have any feedback from this year's conference, contact Maxine Elkin or Louis Yiakoumi. Your opinions help us to continuously improve this event.

OEMS MUST COOPERATE FOR FINISHED VEHICLE COST SAVINGS

At the special Finished Vehicle Logistics forum a panel of experts was given the opportunity to try and reinvent precisely that part of the supply chain. The resulting discussions highlighted some significant problems that need to be addressed by the industry as a whole.

Bert Bong from Ford bemoaned the amount of doubling up that goes on in finished vehicle logistics with processes such as quality checks. He said: "I had a discussion last night with Jorg Mosolf, and we talked about how OEMs all send people to their compound and evaluate how the compound looks. But once the Ford guy is gone another guy comes and asks the same questions – what a stupid process. It should be enough for us to get together and send one guy a year and whatever is good for Toyota or Porsche should be good for Ford as well. I think we generate a lot of effort

and waste by not having a common approach here. The same goes for documentation of damages... If we put it all together in one pot of data and did the number crunching... we could all avoid cost in this environment."

Mike Sturgeon from Toyota agreed: "If we had a clean piece of paper we would do exactly that, we would all put our heads together and come up with a solution that was optimal for everybody. We know what we should be doing and we probably have a fairly good idea about how we could get there, but somehow we just don't seem to manage to take even the first step on that journey. And there is a huge amount of waste in everything that we do. With standardisation, whether it's by standardising ways of working and systems environments, if we had an industry standard it would... enable everybody to work together more effectively and

the cost and waste it could take out of the system [would be] simply phenomenal."

Kay Ewaldsen, MD Werner Egerland and VP of ECG joined the discussion, complaining that: "The biggest impression I get from this industry is the high amount of un-productivity. We have hundreds of trucks moving around empty every day because they are in the wrong place. We have wagons of different types moving around Europe that are passing one another, but both are empty because one can only carry one type of car and the other can carry only the other. We have a principal problem of never having the right amount of assets. We either have too many trucks, or not enough trucks, [and the] same with wagons. One of the reasons for this is that the numbers of cars to be transported and the direction they are transported in is highly unpredictable. If we were working on an

improvement of information flow, we could definitely try to optimise the resources we are all operating with or we could optimise the dispatch. We could find sub-contractors, we could form partnerships; at least we could make the whole thing more economic. I think the whole issue can only be solved if it is put on a higher view level, where we look further into processes than into the short-term budget results."



Mazda's Jørgen Oleson placed responsibility for identifying cost savings firmly with the suppliers – "Don't ask us for the data, you collect the data you already have and come to us...it's much easier to make decisions based on data than discussions," he told Kay Ewaldsen

REDUCING INVENTORY REQUIRES MORE AGILE LOGISTICS

Kazumi Nakada, executive director of Lean Enterprise for Delphi Corporation, opened the Lean Manufacturing session with the statement: "I would like to propose a new collaboration between the manufacturing side and the logistics side."

Drawing upon 18 years working for Toyota in Japan, Nakada described how, when Delphi began looking at its European operations in 2002, manufacturing was the first point of implementation for the principles of the system. He said: "Many companies have tried to implement the TPS, but companies often make a mistake. Our most important priority is to make the right choice at the right time."

With build-to-order programmes being rolled out, efficiency can seem key, but getting the right product in place at the right time with high quality standards will bring efficiency. "All the cost savings in the world won't make up for a loss of customers," he said. "Our job is as quickly as possible to meet the customer's expectation and with minimal gap."

Delphi has 216 wholly owned plants, 42 joint ventures, 32 technical centres and operates in 41 countries, so the challenges



Our job is to meet the customer's requirement as quickly as possible – Kazumi Nakada, Delphi

for logistics are immense.

Lean scheduling and logistics must work together with lean manufacturing, a process Delphi started in 2002. "We began trying to implement best practice in plants in 2002 in Europe with the aim of then copying and pasting the system globally."

At La Rochelle, where Delphi manufactures diesel injectors, inventory in the clean room has dropped from three days in 2002 to between two and three hours now. This kind of reduction in inventory puts enormous pressure on the logistics processes to be efficient, dependable and lean, reducing the amount of inventory in the logistics "pipeline".

Nakada called for a paradigm change in logistics. Looking

at the inbound logistics for Delphi from its French suppliers to Delphi's manufacturing operations in Tangier and Cadiz, the three weeks of inventory in the system wasn't lean. The lean way is to use cross docking at the French and Spanish docks to reduce the three-week inventory to a three-day inventory. "Because the manufacturing side has shaped up we don't need a one-day inventory, we need one-eighth inventory. That's the message."

The challenge for logistics companies is that how to support this complicated materials flow.

Nakada also highlighted the need to use trucks better, describing the approach of carrying goods cheaply by moving in bulk as "Stone Age logistics". The key is to remove inventory for the supply chain to support the lean manufacturing in the plants. "Inventory is a sample of our system, like a blood check. This inventory will show up your problems because it is a comparison between the production and the consumption. If you have a gap here, you have a shortage or overproduction and from this you can start to fix the problems."

EUROPEAN RAIL – USE IT OR LOSE IT

In day two's first session of the Vehicle Logistics forum, Frank Blochman from TX Logistics, argued that the reason Europe does not have a good railway system is because we simply don't use it enough. He said: "Very often when I ask potential customers why they don't use railways to a larger degree, they answer that the service is not adequate. After five years I am almost convinced that to a larger degree, it is the other way round. We don't have the service because we don't adequately use the railway

system, so to a certain extent it is our own fault that the service is not the one we expect.

"There needs to be an alternative to the monopolistic structure, we all agree on that, but, more importantly, we have to develop an industry solution for the auto logistics transport industry in Europe. We all have to cooperate much more than we do today if we want to change things," he continued.

"Railways needs three things: they need volume, they need distance and they need balance. Added to this

they need interoperability and internationalisation – interoperability in terms of new wagons that can be used for different types of cargoes. Otherwise we will not have the type of bundling that an efficient infrastructure for logistics needs.

"Railways needs distance and we have to look at Europe as if it were one country. Why are the railways so successful in America? Because it is a big country and they have distance, they have volume and they have balance; they can even double stock wagons," he concluded.

THE BEST CONFERENCE QUOTES

"Customers expect their cars to be handled and processed exactly as agreed in the contract. The question is, how do we ensure that the care and the coordination of the resources happen and that we never drop the ball, and that we do it all more cheaply? It almost seems impossible doesn't it? We get better and faster but for less money, and I think that is the role of IT, and intelligent workflow plays a role here." – Stephen Jones, Vehnet

"Applying lean principles to the logistics supply chain is not bad news for the logistics partner because we collaborate and we share the benefits." – Kazumi Nakada, Delphi

"I don't think the customer wants to be involved in tracking their own vehicle, unless you are having a €250k-plus car hand-built somewhere in a very expensive factory, they just want to know this is what I bought, when can I have it? We can build a system where customers can look at where their car is but I can guarantee you the hit rate will be very low." – Jørgen Olesen, Mazda

"The change from the former system took almost three years, the reasons for this were we didn't have our own track-and-trace system and changing a Porsche system was too expensive and time consuming. In the past there was no standard transport system – each subsidiary managed this task in its own way. You can imagine that it was extremely difficult to convert all the different companies and make them agree to one common, standard system." – Hartmut Rath, Porsche

"We have now got suppliers who are saying to us – 'I don't need to enter into a long-term agreement with you because I can sell as much as I produce and I can name my price! So now we are running into issues where we are actually struggling to secure product to continue manufacturing some of our components.'" – David Henderson, Cooper Standard

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"You have to go to a place where you find an educated workforce. This is an important factor when you launch a new plant... which portion of our costs is really driven by labour, which portion by investments, and which portion is driven by purchasing wages? You discover that maybe wages are important, but they are not everything; we didn't get a similar flexible agreement in any other place in the world other than Germany, believe it or not. In the US you get every flexibility you ask for, for a 50 per cent surcharge! The interesting thing is getting the same flexibility at the same cost level!" - Karl May, BMW

"Just bringing down logistics costs is very often low-hanging fruit, we need to go down into the supply chain." - Caroline Stolze, Schenker

"My plan is to earn the right to manage our customers on an end-to-end basis. My wish is that more customers were willing to work that way." - Dan Ellerton, Exel

"Isn't it about time that the industry started to agree a definition of what 'good' looks like. Then you will be able to sell on value and not on price, and get the longer contracts that you are seeking." - John Stephenson, Cat Logistics

"I would like to thank the people from Flanders for an excellent lunch but I think it is quite an insult bringing Belgian chocolates to Switzerland! I agree that you might be great as a car producing area but nothing beats Swiss chocolate!" - Bruno Sidler, Panalpina

"Be careful what you say because *Automotive Logistics* magazine publishes this wonderful column, 'Best Conference Quotes'. Last year I made the mistake of admitting to closing down Jaguar's factory on three occasions in one week. I started working for myself around four years ago and last year was the worst year of business yet, so thanks Louis!" - Bob Ashkettle, consultant

TESTING THE LINKS OF THE LOGISTICS SUPPLY CHAIN

The role of logistics service provider seems like a straightforward topic for discussion, but what emerged from the conference session was a divide between the expectations of LSPs and that of their customers. This is not surprising when manufacturers are targeting logistics as a cost-saving area, but Bruno Sidler, CEO at Panalpina argued that this situation doesn't encourage cooperation and transparency.

"We have been able to reduce costs for our customers not just by getting costs out of the supply chain, but by reengineering processes. It is hard to do that because it is an upfront investment in resources and time, and the payback, unfortunately, only comes later.

But without being able to do that it is going to be increasingly difficult in the future to deliver the cost discounts you need."

"On an operational level we do what we are told to and only when we can move into the tactical level are we really going to address the process change - that is where we will deliver most of the benefits in future. We have not reached this level with any customers in the automotive industry."

Dan Ellerton, President, Automotive Worldwide, Exel, told conference delegates that, to survive as an LSP, "you have to be very good at what you do and managing your business. We have a period in which individual links in the supply chain are being squeezed...and

there is still more to go. But it is a law of diminishing returns and we must now [identify where] the opportunities are and look at end-to-end solutions."

He called for LSPs to align their goals with their customers. This, "creates the right behaviour and breaks down the silence. I won't mention any names, but some of the biggest relationships we have are still measured on transportation costs. Even if we take days and days out of plant inventories, spare parts inventories, they are not allowed as savings in our relationship because the logistics director is the transportation director and manufacturing gets the saving on inventory. That's the way we engage and it's ridiculous."

HONDA CALLS FOR MORE ACCOUNTABILITY IN AFTERMARKET

During the Service Parts Forum, Ray Runza, operations director of logistics at Honda Logistics Centre UK, said: "The level of accountability in the transport industry for service providers is so incredibly low that I struggle to see how you survive as a business."

He called for more visibility of transporters' performance, a reduction in the number of partners and better information from providers. "We would like to actually know the results on the day of delivery," he said, "so we are aware of our customer's satisfaction before they tell us of their dissatisfaction. We would like you to accept full liability: If you lose it [a carton] we expect you to pay for it. If you damage the product we expect you to inspect it and tell us it is damaged; why should we claim that with our insurers?"

"I would like to emphasise that we don't want one euro



Honda's Ray Runza, Ford's Helmut Nittmann and John Stephenson from Cat Logistics discussed accountability for service providers

from any provider, we just want you to do your job. In the area of spare parts, nearly all of our partners have accepted these conditions."

Runza revealed that Honda is building an integrated transport system to enable Honda to know how to manage its 62 partners in Europe. He admitted, however, that Honda is bad at organising return freight, a key area for cost savings, which is one reason why it has just signed Norfolk Line as its new single partner in Europe. The new contract aims

to cut Honda's aftermarket logistics costs by 8.5 per cent in three years, by "improving load returns and combining Honda traffic with other Norfolk Line business. [This way] we can get better pricing and shared utilisation."

John Stephenson from Cat Logistics highlighted how model complexity has led to massive proliferation for the parts business. He warned: "You start to question whether proliferation is affordable, for both parties - OEMs and their dealers. Holding all those parts for all those years for the customer is questionable as a sustainable strategy. Something has to change substantially."

Helmut Nittman from Ford described how the company met the challenges in the US of 10-15 year service life policies by first asking suppliers to retain the liability for servicing parts after they go out of production, and by maintaining the tooling to reduce inventory in the supply chain.

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"Like any company in business we would like to achieve cost down and performance up, but most importantly we want to improve customer service, and again, to be very frank, I think in the whole of yesterday I heard the customer mentioned once or twice. For a service-led industry, once or twice? Please." - Ray Runza, Honda

"Some people say the logistics provider should provide the packaging and manage it because they are dealing with all parts of the supply chain, but not many logistics providers purchase the packaging." - Rodney Salmon, Linpac

"We have a huge competitive advantage because we have this integrated transport network, so we don't wake up asking 'will we have the trucks today?'" - Laurence Capieau, Gefco

"The development to the east, which is creating longer flows of transportation with the new production sites in the east of Europe, this will all support and foster the climate for increased volumes (of finished vehicles) on rail." - Ralf Janhncke, Transcare

"Transport costs are not the big issue - we want to do more in the supply chain than just bringing down transportation costs. How do suppliers themselves restructure their processes? This is where it gets interesting." - Caroline Stolze, Schenker

"If you are squeezed to the bone, if you have a margin left, you try and hide it from your customers. I was going to meetings and customers were telling me that we weren't proactive enough. At first I was annoyed and felt they were unfair, but the truth is we are not proactive enough. It needs a culture change and that can only come if we sit with manufacturers and LSPs at the same table, at the same level, and discuss the solution. [We need to] find a way to compensate the provider in a fair manner, totally transparent, with a share in the gains." - Bruno Sidler, Panalpina

MAGNA TACKLES EUROPEAN CONSOLIDATION

According to Michael Druml, director of Supply/Logistics at Magna Steyr, the company faces complex challenges similar to those of vehicle manufacturers, with some 1,800 deliveries a day going into its Graz plant alone, from 2,600 suppliers. In addition, the company faces challenges dealing with OEMs with different systems. It has less schedule stability and the product development cycle is different.

Druml told the delegates that all of these factors "don't help to standardise logistics concepts. Our goal is individualisation versus industrialisation." The solution? To increase direct

shipping, which Magna has formed a special team to investigate. It has also recently started to try to consolidate its European logistics operations. Magna plants have traditionally been run as independent profit centres, leaving little room for optimisation across the network. The project, called MOTE, is in the process of setting up a database where every plant provides transportation data to which everyone has access.

As Druml put it: "You shouldn't ask for help [from logistics providers] if you don't know what you need. Not even our service providers could combine shipments because

individual companies were using different service providers."

This drive to communicate data between OEMs and LSPs is key, and he agreed with the other speakers in the Cutting Transportation session that logistics needs to be integrated into the planning stages.

He said: "Everybody talks about integrating logistics in the planning stages, but this is not the truth. Do we know if the engineer is even aware of what this means?"

"This awareness is not really there, we need to talk to engineering and tell them what we need," Druml added.

MODERN LOGISTICS IS MORE THAN JUST SHUNT AND GRUNT

Michael Storey, Group Sales and Marketing Director, NYK Logistics, spoke to the conference about working with lean manufacturing systems from the point of view of the logistics provider.

He said: "If you are going to embark on a lean manufacturing programme there are things to think about. It is only going to work if you have got data and this is critical. Having the responsibility to get from supplier to point of fit means you are absolutely dependent on decent data regarding what parts you are dealing with, what the variance is, how many go in a box, what sort of box it is, what's your cycle, and what's your kanban time. For organisations that are changing from a push mentality to a pull, you may not have people in the environment who are going to answer those questions directly. A great deal of time and effort has to be expended on getting the information you are going to start with... without the data you are not going to succeed."

He explained: "As a very simple thing, plants will have



NYK's Michael Storey emphasized the importance of decent data in implementing lean manufacturing

scheduling systems which show that the following things are going to be delivered on the following days. Sometimes, what they may not realize is that their suppliers aren't open on those days. As a result, if you are going to a lean manufacturing system you can put something like 20 per cent variance into your transportation network because someone is automatically in arrears because they are shut on 6 January and your plant is building. If you don't consider those things at the start it makes it very difficult to manage a lean manufacturing system without giving a rationing control back to the LLP."

The automotive industry is not an ideal world, Storey said: "If someone does purchase a part from 'penguin land', you can bet your bottom dollar that the person responsible for getting that part from penguin land through to the point of fit is going to have an issue with it. It is going to drive all sorts of other criteria into the planning. And often the decision is made without any recourse at all to what that provider has to do - given the space they have, given the packaging cycles they have got. I think it really is a case of being participative... it is not purely the logistics sector and it is not purely manufacturing activity," said Storey.

"When you are supplying these services you end up in areas of the business you didn't previously think you belonged in. You thought you were a trucker, or someone who shunted and grunted in a warehouse, and you end up doing lots of extra activities. It has helped a company such as ours because our skill base is far wider and far greater than it was when we started."

VW'S FRITZEN PROMISES BENEFITS TO SUPPLIERS WHO AVOID TRANSPORT

Asking a group of people who work in logistics how to avoid transportation "is like asking a dog to watch a sausage," according to Johannes Fritzen, president of Volkswagen Transport, and the first speaker in the second session of the conference. But in an age of increasing complexity of model types, it has to be considered. He said: "In a nutshell, the variety of models goes up, individualisation goes up and hence the complexity goes up. At the same time, the number of vehicles goes down, product cycle times and manufacturing throughput times go down." The Golf V consists of an average of 6,000 modules from a range of about 25,000 build parts, a seat assembly alone consisting of an average of 70 build parts from a spectrum of about 510 parts. As for

the variants available to the customer, these add up to a staggering 300 million possible permutations. In these circumstances, when different departments within a carmaker and logistics company don't communicate, "there can be a lot of empty trucks moving around the supply of the model".

Fritzen told delegates that for the production of the Golf V, VW Transport entered the process shortly before the start of production, which is the norm, but he argued: "The supply was fixed, all we could do was to optimise transport by combining the cargo." The difference in design and size between the radios for the Golf IV and the fifth generation nearly doubled the overall transport costs.

Fritzen called for logistics to be integrated with purchasing

and even design if costs are to be reduced in the logistics supply chain.

He revealed another way that VW is tackling this issue – asking suppliers to "come up with a new way of thinking. Contractors are being asked to identify where transport can be avoided. This may come as a shock to some of our providers... but we guarantee you that what you give up, you will gain down the road. These partners will have an increased volume of work."

Christian Zbylut, Executive VP - Network at Gefco, began by saying: "It could seem strange to tell logistics providers to avoid transportation, but this is exactly what we have been doing for the past few years, working out how to reduce empty space on roads and rails." He argued that it is for

the logistics provider to take the initiative, commenting that vehicle makers and suppliers "cannot optimise at the same level as a logistics provider can". He identified the increase in volumes moving to and from Central Europe and warned: "Transferring production can generate economies but will increase transport costs... be aware of the logistics cost."



VW Transport's Johannes Fritzen called for the approach to logistics to be integrated with purchasing and even design if costs are to be cut in the logistics supply chain

AUTOMOTIVE PACKAGING INDUSTRY CALLS FOR A COMMON APPROACH

Standardisation seems to be the buzzword in packaging at the moment and yet no one seems to achieve it said Rodney Salmon, head of sales and marketing for Linpac. "Standardisation? I would like to turn round to you as a packaging supplier and say 'you've got no chance', everybody wants their own type of packaging."

Durable packaging is becoming more popular with the new emphasis on waste-free environments. Yet costs for raw materials, particularly resin, polymer and steel, are going up. "In the past 12 months steel prices have doubled and polymers have gone up something like 65 per cent; these are huge increases."

Increased oil prices have also affected packaging costs in an indirect way, so while manufacturers may appreciate the cost savings brought



Standardisation? I would like to turn round to you as a packaging supplier and say you've got no chance – Rodney Salmon, Linpac

by standardisation, getting packaging considerations into the planning stages for new models isn't happening. In an earlier session Johannes Fritzen from VW Transport detailed how the logistics cost for the radio unit of the Golf V nearly doubled because the unit design changed.

In spite of these factors,

there are ways to get cost down, said Salmon, like using nesting and folding boxes, as the retail industry does. "It doesn't take a genius to understand the huge savings you can get in logistics costs, but also in storing and warehousing."

Gilles Cudia, Sales and Marketing Manager, Gefco, suggested that container management on a global scale is the way to cut costs, though sharing transport. "It is difficult for our customers to reduce costs when each one has his own containers. Container management has to be centralised to have a global view of the market. The fact that we can share enables us to reduce costs." This enables Gefco to return containers to the nearest centre, rather than always returning them to the location of origin, a strategy that can produce huge

cost savings when transport distances are being extended far beyond the traditional manufacturing areas.

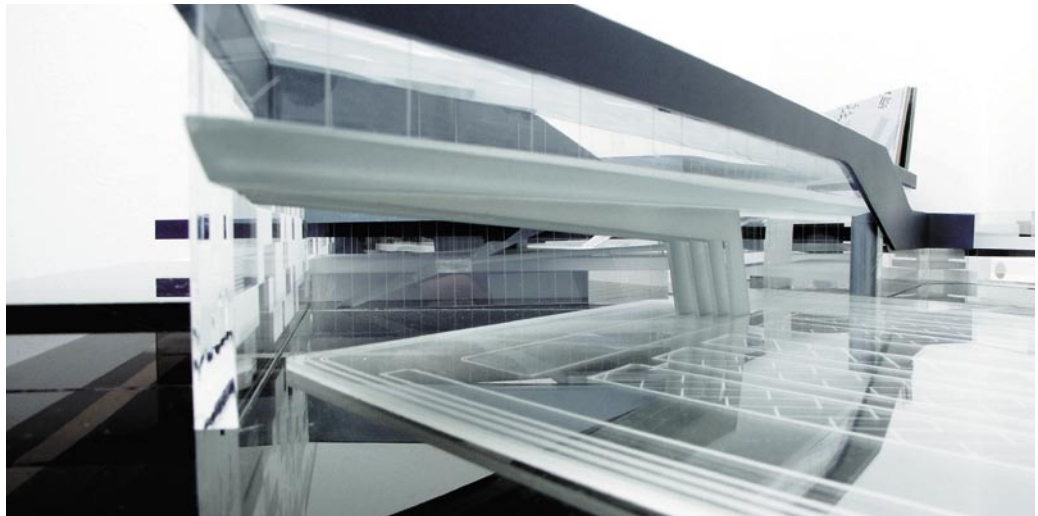
Visibility and the enhanced track and trace in the system is important, but Laurence Capieue, Business Unit Manager, Gefco, stated that there is only about three per cent invisibility in the Gefco network at the moment for track and trace and that putting systems in place to tackle this will cost money. He said that processes like this were not the way forward and that cost saving in the industry should focus on getting rid of the existing waste in the supply chain, like the lack of pooling of resources across customer brands and even industries. And it should tackle the problem that too many reusable containers being moved around the network empty.

BMW'S LEIPZIG PLANT DESIGN BOOSTS LOGISTICS AND ASSEMBLY-LINE EFFICIENCY

The day before the start of the conference, the first car left the assembly line at BMW's flagship Leipzig plant, which is due to open officially on 13 May 2005. In his presentation to Montreux delegates, Dr Karl May, Vice President, Logistics Planning and Transport Logistics at BMW, outlined how logistics considerations shaped the design of the manufacturing facility and how the company had designed the plant to be flexible for the future. He said: "It is a plant that is driven by a lot of logistical ideas and principles. Last year BMW sold about 1.2 million cars. We have some 26 manufacturing points and, as you can imagine, that is a logistical challenge and we had to integrate that new plant into this network.

"When you have the chance, once in a lifetime, to really build a new factory, to really go with a greenfield approach, and you are not restricted by existing conveyors and existing infrastructure, you have to think very clearly what you are going to do.

"When you move into a new factory you have to be very careful that some elements are stable. You have a sort of triangle between processes,



Long-term logistics considerations shaped the design of BMW's flagship Leipzig plant, which will officially open on 13 May

product and structures, and if you try to change everything at once that is a challenge you can't meet, so we tried to have a product which is proven," he said.

May described how starting with stable processes and a proven product allowed BMW to build in more flexibility for model variation and potential developments at the plant.

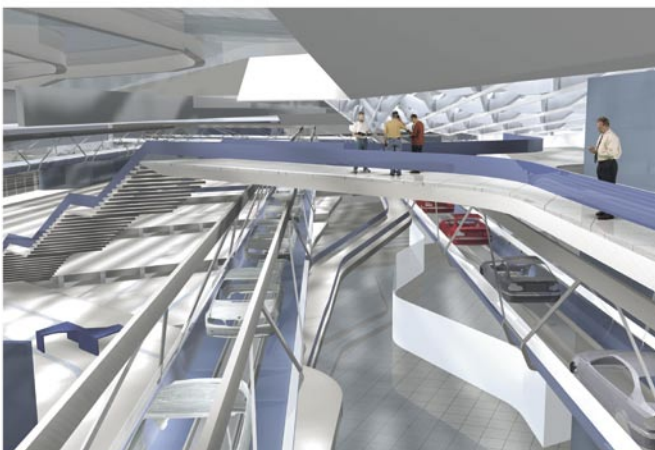
"We live in world that is changing faster and faster, so we have to make sure that we have structures and that we are organised in a way that enables us to cope with that change. The only answer to the volatility around us is

flexibility and that has to be in terms of capacity. A lot of you have probably read about the web time agreements we have for the Leipzig plant... and we have to be flexible in terms of product, because you can't build the plant for just one product, you have to build it for at least the next 30 years. Plus you don't know what the products you build in 20 years will be like, so you have to have flexibility.

"We decided very early that we wanted a supply centre on site. Another logistics consideration was that we needed direct access to the assembly line. We want to maximise our opportunities for direct deliveries, that is the most efficient process you can have without having to go through a warehouse of sub assembly. In old structures that is impossible because you just can't get into the building at the right point. Clearly we had cost targets, with lean processes we are set to make a major jump in terms of productivity. Another premise, which is important in terms of logistics, is that we have a stable sequence in the assembly, which is very important for

sequence supply. And we wanted to have late module configuration in the supply centre."

Leipzig has also been set up to encourage supplier competition from LSPs. May said: "We have two supply centres on site which ensure we have some sort of logistical competition there. We have the two centres operated by different service providers, so we are not too dependent on one logistical company, we always have a second company on site which knows our processes and, at the end of the day, we will be able to step in if the other company doesn't work properly. I think that is a very important point psychologically for both companies. In those supply centres we have module assembly, module manufacturing from external suppliers, and from internal suppliers. So there are BMW component manufacturers in a certain area in that supply centre and in other segments of the centre there are Tier One suppliers. This is a very flexible concept because for the next product lifecycle you are able to segment the supply centre in a different way."



When you have the chance, once in a lifetime...to really build a new factory... you have to think very clearly what you are going to do - Karl May