



## CaseStudy

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**SyncroTESS**  
Efficient Logistics

## From assembly line to dealer

The SyncroTESS transport management system controls and optimises finished vehicle logistics of Volkswagen in Mexico. Over 440,000 cars of Audi, Bentley, Porsche, SEAT and Volkswagen are handled each year in ports and yards.

“He has already covered 10,000 kilometres without having to drive on himself”, jokes the VW dealer in Germany. Together he stands with a customer in front of a new Golf Variant, which now can be picked up. VW produces not only the Golf Variant, but also the New Beetle and the Jetta in Mexico, Puebla. Every year, 16,000 employees roll out more than 400,000 vehicles for the worldwide market from the assembly line here. And this is where this article starts. Right after checkpoint 8 (CP8), after the handover of the finished car from production to logistics.

For the effectiveness of the global supply chain of finished vehicles the most thorough transport planning possible is of crucial importance. VW Mexico faces the challenges of both production types: The cars for the European market are mostly built-to-order (BTO) whereas the cars for North America and Mexico are mainly built-to-stock (BTS). Therefore the demands are quite different: The BTO car has to arrive at the agreed delivery date in the right country and the correct dealer. In contrary the dealers in North America want to have sufficient attractive cars on stock, so the customer can choose from a wide variety of models and configurations.

For this purpose VW maintains three operations in Mexico. A big yard at the plant in Puebla, an operation for import and export in the port of Veracruz and an export operation in Acapulco. VW is working hard to constantly optimise the operation in this supply chain, which is done mainly by two departments: Traffic and Transport manages the daily operation and the group of Björn Beckmann is responsible for logistics planning. In 2005 both departments came to the conclusion, that the strongest benefits for further optimisation could be gained by the introduction of a supply chain management system, which should provide the following benefits:

- Highly integrated in Volkswagen IT
- Central system for all operations; stop using various different systems from 3PLs
- Process and system owner should be Volkswagen to assure independence from 3PL
- AOS = automise, optimise and synchronise to generate savings, by doing more with less

This is a complex task, as a look at the figures shows. The yard in Puebla has a capacity of 11,500 cars, added by 8,000 spaces in an “external yards” close to the plant and the yards of the ports, which provides in Veracruz for example 12,000 more parking spaces. These yards are constantly filled with roughly 1,700 cars of the production in Puebla and by import vehicles which arrive mainly from Europe and South America by vessels in Veracruz. Looking at these numbers the need to constantly ship vehicles out of the yards to their final destination is crucial to the operation. “We ship about one train per day with 600 export cars to North America and one to the port in Veracruz”, explains Hector Romero, responsible for the yard management

in Puebla. On top of that about 80 to 100 trucks are loaded each day to ship trucks to mexican dealers or to the ports. These so called “Madrinas” are giant trucks with a capacity of up to 15 vehicles. “As a result of the big numbers of cars leaving and entering our operations most cars do not remain longer than 1.5 days with us in the yards”, explains Beckmann.

After an in-depths analysis of the processes and demands of both departments in 2005 VW compiled a requirement specification, which was used for a request for proposal with international software vendors in 2006.

After a careful examination of all proposed systems, the best solution was found by utilising the VW-own system TOMCADS, which was already developed in Wolfsburg for the global planning of vehicle routes and SyncroTESS, a standard system for finished vehicle logistics. TOMCADS provides the global routes, like Puebla -> Veracruz -> Emden -> Dealer together with all necessary vehicle information, like destination, model, etc. Then SyncroTESS utilises the information in order to manage each single process step inside the yards and between them in Mexico. Thus the people of the daily logistics can concentrate on the use of SyncroTESS as the main Supply Chain Execution system in place. Only if the general setup of a transport relation needs to be changed, the configuration of TOMCADS needs to be adapted as well.

“Only SyncroTESS could truly fulfill all needs of the AOS strategy” says Björn Beckmann: “After receiving a car in SyncroTESS, the system generates automatically the correct workflow and creates the different jobs, like inspections, moves, loading, maintenance and so forth in the right sequence.” Then the jobs are assigned by optimisation algorithms to the users. “Furthermore the transport management module and here esp. the trip optimiser provides savings, by planning the trips for the over 500 cars shipped daily to the domestic Mexican dealers. “Similar optimisers are used by SyncroTESS also for ground handling at airports or the movements of containers inside a container terminal”, explains Matthias Berlit, INFORM’s head of industrial solutions and responsible for the system’s introduction in Mexico, “only a computer system with highly sophisticated algorithms is capable of optimising these complex processes in an efficient way.”

In September 2007 the solution with the internal project name Vehicle Distribution Network has been implemented in Mexico. “The first goal was to establish a central system which manages all transport stages within Mexico transparently in one system”, says Björn Beckmann, “furthermore we started with the yard management in Puebla and shortly after in Veracruz”.

#### **Intelligent yard management**

For cars which are produced in Puebla the process starts right after checkpoint 8. Approximately three to four hours before, the car was already announced by TOMCADS to SyncroTESS. After CP8 the car is first subject to a reception inspection in which the condition of the car is scrutinised. “In case of any defects or damages, the car is returned to production and SyncroTESS re-plans the car’s route under consideration of the necessary repairs”, says Beckmann. After a successful reception, the car receives protectors and is provided with bypack like the manual (right model, country and language) and other items. Afterwards the car is stored into the yard, where SyncroTESS stacking optimiser decides about the best possible space by taking several characteristics of the yards and the car into account (destination, expected transport mean, slow mover, fast mover etc.). Is the car already considered for a trip in the near future, the system may send the car also directly to the appropriate load lane. Further processes which are part of the system are Pre Delivery Inspections (PDI) and the important damage handling processes.

#### **Efficient transport management**

The transport management includes all relations between the different operations and the trips to domestic dealers from Veracruz or Puebla and the trains heading with export vehicles to North America. “With the optimisation of trips we want to compile the best possible transport routes, which shall ensure an efficient and on-schedule delivery of all cars”, says Beckmann. “Besides special requirements by some dealers or cars, the general rules for the optimisation of dealer trips are: As short as possible and utilise the trucks a high as possible.”, explains Beckmann.

“In order to utilise the transport means as efficient as possible we have to consider the right sequence of provided cars already



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when removing the cars from stock”, says Beckmann, “for example, we have a capacity for 17 cars in our rail wagons. But if the cars are in the wrong order during loading, we loose capacity or have to rearrange the sequence manually and find an appropriate car.” “Now the correct sequence is ensured by the load configurations saved in SyncroTESS which trigger the move orders exactly in the needed sequence”, adds Berlit.

The organisation of import/export cars has another complexity. “Here the synchronisation considers the in- and outbound flows of each operation and optimises the volume between the operations with respect to capacity of the yards, arrival and departure of vessels with thousands of cars leaving or entering the operation and the available transport means”, explains Beckmann the demand of VW. The optimiser balances for example the import transports from Veracruz to Puebla with the export transports from Puebla to Veracruz.

## Successful implementation

With SyncroTESS VW now has a highly integrative system which synchronises and transparently controls all these processes. "Moreover, the system is easy to configure and operate. The GoLive support could be concluded after 4 weeks only! For such a critical and complex task a very short time", explains Hector Romero, who was working jointly with the staff of INFORM and TOMCADS in the implementation phase. "After the normal fears the people had in the beginning we have now a high acceptance of the system by all our users" he adds.



VW and INFORM have been awarded the elogistics award 2008 for innovative solutions in logistics by the German Automotive Congress AKJ, a group of industry experts working on concepts and solutions for optimization of automotive supply chains.

Altogether, about 200 people are working simultaneously with SyncroTESS today. The overall number of users is of course much higher due to the 3-shift operation.

In spring this year the phase 2 of the project will provide a web portal for the carriers in which their trips are shown and data can be entered already a day in advance (pickup time, truck number etc.). Furthermore SyncroTESS will get an interface to the trucks onboard units and GPS, which enables SyncroTESS to display the position of a truck, but also to communicate with the driver or to generate automatic alerts if a truck will be late.

The introduction of the system has already paid off for VW. "In the past, we had different individual yard management systems, which came along with our logistics providers. These systems were only collecting the data, but did not manage nor optimise the workflow", says Beckmann. "First of all we have now a system which works centrally and contains all information online. Second we are able to optimise each process and synchronise them over the operations and third we have less manual work because of an automated workflow and a highly integrated system. Besides the higher quality of the operation, the monetary aspects are of course of highest importance." Beckmann adds: "We expect a return on investment of about 24 months, which is a short amount of time considering the amount of infrastructure which also had to setup."

But not only VW profits from the new system. Also the dealer and customer have a benefit from the faster and more secure delivery process.

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