LeanCor LOGISTICS

Lean Inbound Logistics: The Key to an Advanced Supply Chain

White Paper

In this comprehensive white paper, LeanCor CEO Robert Martichenko shares 10 proven insights from his early days supporting Toyota that have paved the way for today's advanced supply chains.

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Introduction

"When the student is ready, the teacher will appear." – Buddhist Proverb

I suppose there comes a point in every person's life when it's appropriate to check in with oneself and ask, *"What have I been up to over the course of my career?"* This notion came to me recently and I became somewhat reflective of the path and work that many supply chain professionals have chosen to pursue.

It seems like only yesterday that I graduated from university with a degree in mathematics. Upon graduating, I was surprised to find how few companies were looking for graduates of mathematics! Fortunately, I was given an opportunity to learn at a progressive, entrepreneurial trucking, and logistics company in Cambridge Ontario, Canada. My days at Challenger Motor Freight were formative ones. After several years working in the Canadian trucking industry, I was offered a position with a third-party logistics company responsible for supporting portions of the inbound logistics processes for Toyota Motor Manufacturing. My role would be to lead the efforts for my organization on site at a U.S. Greenfield Toyota facility. As a young professional in the logistics industry, I was aware that this was a great opportunity. In hindsight, I did not realize this experience would be a catalyst to define who I am today, both personally and professionally. Even though this experience is now approaching the twenty-year mark, I continue to learn from memories of conversations, tactical experiences, and strategic principles I learned along the way. In fact, the experience of supporting Toyota Motor Manufacturing provided the foundation to build LeanCor Supply Chain Group.

As a young professional born in Northern Ontario, moving to the Midwestern U.S. was quite a big deal. When I arrived at Toyota's Greenfield production plant for the first time, it was literally a huge steel building set in the middle of cornfields. I was immediately given a tour of the "will be factory" in process, including the strategy deployment room ("Hoshin planning") where the timeline for the entire factory construction and implementation was being managed on one wall. This was my first experience with lean tools such as "red" and "green" visual status indictors, and the Plan; Do; Check; Act (PDCA) cycle relative to the entire project. From that day, it would be another 10 months of work before the first Tundra pickup truck came off the new line. I can sincerely say that my learning started that first day.

The factory and all construction sites were clean and clearly embracing a culture of safety culture. People took time to introduce themselves to me and made sure I knew how to contact them if I needed assistance. The "open office" concept for desks and work stations was startling – a sea of desks in one room seeming as large as a football field. A busy hub of collaboration and teamwork hummed and moved with what looked like planned chaos and great purpose. I was surprised to see the plant president's desk right in the mix with all other leadership and team members. In that first day, I saw (but did not yet understand) the essence of 5S (safety), Hoshin planning (strategy deployment), teamwork, waste elimination, visual management, and other lean principles of the Toyota Production System (TPS).

I will readily and sincerely admit I was intimated, wondering if I would be able to meet the standards and add value to this incredible operational start up.

Purpose: The Beginning of the Work

Lesson 1: *You must have guiding principles in place to support supply chain and logistics strategy.*

The core purpose of the factory was to meet customer expectations by building the highest quality vehicle at the lowest possible total cost, all while respecting team members and the community and world at large. My team's purpose was to play our part in this greater vision by connecting the supply base to the new factory with an inbound logistics system based on TPS guiding principles: *safety, pull replenishment, velocity, leveled flow, lead time reduction, stability, standardization, quality at the source, waste elimination.*

When implemented, these principles would help drive a stable inbound supply chain. What I remember most about the first part of my work was the steadfast focus on these guiding principles. Not once did I hear, "our job is minimizing transportation cost" or "we need to only buy supplier parts in truckload quantities." That is not to say that we ignored transportation cost. Quite the contrary, as managing transportation costs became an obsession. However, it was not the guiding principles, or primary driver, of our work.

I define a guiding principle as something that you just believe. There's no data required to support your belief, you just know it's the right thing to do. This was my first lesson supporting Toyota Motor Manufacturing. You absolutely need guiding principles to guide your supply chain and logistics efforts. In subsequent years, I've learned that the absence of guiding principles only serves to create a business environment where senior leaders continuously tamper with the business by changing strategies and directions as frequently as business conditions change. This, in my opinion, serves only to confuse customers, team members, and all other stakeholders in the supply chain.

TPS Guiding Principles

Safety
Customer Focus
Pull Replenishment
Velocity
Leveled Flow
Lead Time Reduction
Stability
Standardization
Quality at the Source
Waste Elimination

Collaboration

Collaboration: A Necessity for Success

Lesson 2: *Supply chain collaboration is about understanding the strengths and weaknesses of all supply chain partners while teaching and working with them.*

I worked for a Third-Party Logistics (3PL) company to which Toyota outsourced portions of its logistics operations. At first I was surprised to learn that Toyota outsourced portions of their logistics processes – namely, network engineering, transportation, and cross docking management. (Is Toyota not the best of the best in most industry standards for logistics?) I quickly learned that Toyota's idea of outsourcing is very different than other organizations. I have seen many companies outsource functions simply because they don't understand the process and just want to avoid it. Nothing is further from the truth with Toyota. They strategically outsource processes they feel other companies can operate successfully, however, they're never removed from the process from a thought leadership point of view. It may not be a Toyota truck going down the road, but Toyota and TPS thinking have been a part of where the truck came from, where it's going, and what's on it. This is true collaboration. While it may not always be fun for the 3PL, the successful relationships are those where the 3PL embraces what it can learn from its customer. I personally tried to learn as much as I could from Toyota on the job through reading and through asking questions. I learned quickly that an environment where people are focused on problem solving is an environment where, *if the student is ready, teachers will appear* in all corners of the building.

People & Planning

Lesson 3: *People development and process planning are critical to initial and sustained success of any operational undertaking.*

When I arrived at the factory, I was the second employee on site representing my company. The first was a talented young logistics engineer who was laying the ground work. He helped me immensely in understanding our task and the Toyota culture. Between the two of us, combined with excellent support from our corporate offices in Canada and the USA, we had to go from a team of two to a team of over 50 people within six months. Those 50 people would need

Building the Team

experience in logistics engineering, transportation, fleet management and, most importantly, truck driving – as it's the truck driver who is responsible to pick up and deliver inbound parts from the supply base.

Building the team was the most important part of our work. It was my first lesson in understanding the principle of "quality at the source." In other words, get it right the first time. We were in a hurry, but we tried not to be hurried. We interviewed people several times before we made a decision. Leaders from corporate came to the factory to support interviews. We reached out to universities and asked for their "star" players. We knew that if we hired the right people up front then we would be successful with our operations and processes. Brilliant processes do not run themselves; people are required to implement and sustain them.

Over the first few months, Toyota expected us to hire and train the team we would need in place for Start of Production (SOP). We brought people into the operation – including truck drivers – when there weren't actual routes to run and no freight to pick up yet. Why? Because teaching and educating our team members on TPS and planning was part of our culture. Many would criticize that there may have been too much planning, but I never saw it that way. I have been involved in many projects since my Toyota experience where the people and planning side was not taken seriously. In these cases, the lack of results was obvious very quickly.

Engineering: The Start of Lean Inbound Logistics

Lesson 4: *For any big initiative, develop a cross-functional team and perform the process manually the first time.*

With people and processes being developed, our first real "logistics" task was to create a route design to connect the supply base with the factory. This was set up as a week-long focused initiative in a conference room with a cross-functional team from Toyota and my organization.

We started by outlining our purpose and plan for the week, then set up tollgates for each day of the week. The below are the high-level steps of the process we used. (Note: much of this process was manual with limited aid from computer programs).

1. We plotted each supplier on a map of North America (it was nice to see that Toyota embraced domestic sourcing).

2. We identified the projected volumes per day and week for each supplier.

3. We ran the projected volumes through our packaging file (PFEP) to get "cubic" volumes from each supplier. This allowed us to understand how much space each supplier would require on a trailer.

4. We regionalized the suppliers into geographical clusters for multi-stop milk run routes, direct routes to the plants, or routes run through a cross dock with parts ultimately heading to other Toyota factories.

5. We targeted the number of pickup and delivery frequencies we wanted for each supplier.

6. We finalized the routes, named them, and began the work of running miles and developing route specs (standard work for our truck drivers) to ensure a driver or team of drivers could safely run the route and adhere to all rules under the Department of Transportation regulations.

While the above list of steps may seem simple, it was far from trivial. During that week, we routed hundreds of suppliers supplying thousands of part numbers combined. The task did not only include getting parts to the plants but also getting returnable containers back to the suppliers using the same TPS principles of *pull, velocity, leveled flow* and *lead time reduction.* To say the task was complex and daunting would be an understatement.

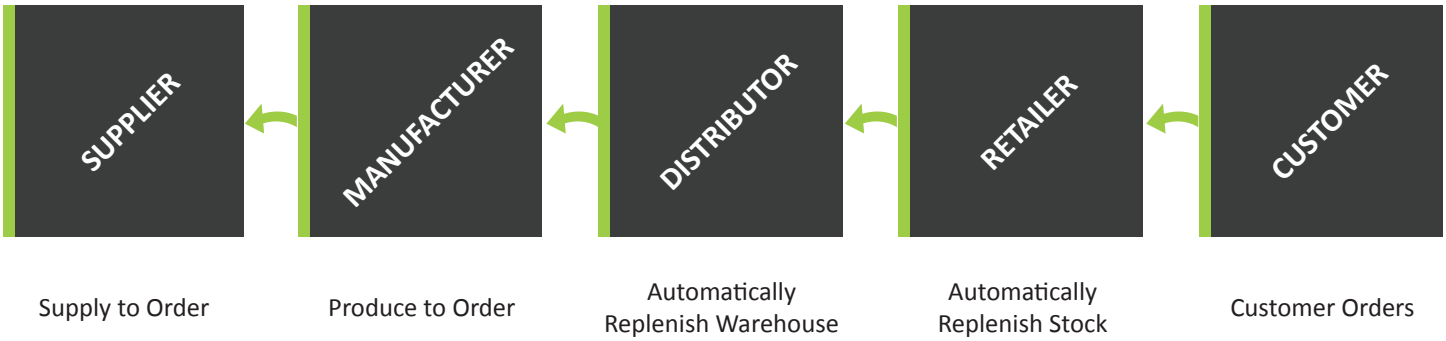
Even though my entire career at the time was in logistics, I had never participated in a route design this large in scale. I remember feeling that "there must be a software package that can do all this for us." However, that was not the point of the exercise. Manually plotting the suppliers ensured we understood the names of the suppliers. Manually plotting supplier volumes ensured we understood the volumes and part complexities for each supplier. Manually building routes ensured we understood each route implicitly. I later learned that forcing a process to be completed manually is known as putting a "finger print" on the process. Simply allowing a computer to do work for you does not allow you to understand the work. That is not to say that over time we did not automate some processes that could be automated. However, when you do something the first time, there is no greater lesson than to perform the process manually.

Pull Replenishment: A Cornerstone of TPS

Lesson 5: *Pull replenishment starts with customer demand and then dovetails into the production schedule and upstream to the supplier.*

Pull replenishment (or "Just in Time") is defined as "replenishing in the exact quantity as was consumed in the previous period and having the replenishment arrive only when the parts are required." I think the concept of pull replenishment has been over simplified by many companies and, because of that, many people feel it is easy. Nothing could be farther from the truth. The essence of pull replenishment, or "pull," is that "if I used it today, then I need to replenish it in the same quantities for tomorrow." The fundamental premise is that "if I used it today, then I will need it again tomorrow." This works for Toyota, yet it seems to elude other organizations. The fact that it works for Toyota is the brilliance of TPS. The heart of TPS is stability. The heart of stability is "how can we make every day look the same?" If every day looks the same (or, our production schedule each day can mirror the day before), then pure pull will work. In other words, if today is the same as tomorrow, and I used parts today, then I will need those same parts in the same

Pull-Based Model



quantity tomorrow. Under these circumstances there are no complicated algorithms (or MRP) required to determine part requirements. Simply order what you used today from the supply base for tomorrow.

It would be naive to say that Toyota (or any other organization) achieves this utopian state of every day looking the exact same. However, this was the goal of the production planning and materials functions during my Toyota experience. It was yet another non-negotiable guiding principle of lean supply chain management.

Our job as logisticians was to take the work of the production planners (who focused on stability) and to connect the production plan to the supply base. At no point did the plan start with the supplier simply shipping parts. It always started with the production schedule, which downstream was connected to actual customer demand, and upstream was connected to supplier replenishment.

Velocity and Lead Time Reduction

Lesson 6: *Reduction of lead time needs to be a primary goal of the logistician. We must believe in "economies of time."*

Velocity is a well-used, yet often ambiguous, word in logistics. When we say "velocity," we are talking about increasing the speed of material and information flow in the supply chain. This is about reducing lead time, a core principle of lean thinking. I often tell people that as a student of lean, I became a thinker of "economies of time" as opposed to "economies of scale." The theory of lead time reduction may seem simple but is far from intuitive. The theory of *economies of time* is fundamental to our understanding of lean.

The worst waste of all is overproduction. Overproduction is defined as *building more* than you need to service customer demand or *building earlier* than you need to meet customer demand. From an inbound logistics point of view, overproduction can be defined as *ordering more* parts than you need or *ordering parts earlier* than you need. Overproduction is considered the worst waste of all because it creates all other wastes. As soon as you have material or finished goods that are not required by the customer, you are forced to store, transport, rework, and wait on those goods to be required by the customer.

Reducing lead time is a core principle of lean thinking

So, if overproduction is the worst waste, why do companies overproduce? Because of *lead time dynamics.*

To answer this, let's review a few definitions of lead time:

- **Outbound-logistics lead time:** The amount of time it takes to stage, ship, and transport an order to the customer upon receiving a customer order.
- **Manufacturing-replenishment lead time:** The amount of time it takes for you to manufacture your product after you receive a customer order.
- **Inbound-logistics lead time:** The amount of time it takes to order and receive material from your supply base to manufacture your product.

With these definitions in mind, we can define total lead time as the amount of time it takes for us to order material from our supply base to when we deliver product to our customer. (A more rigorous definition of lead time would include the time it takes you to get paid from the customer after receiving a customer order.)

If you could design the ideal supply chain, it would be a process where you build to customer order (Build to Order or BTO) only. You would carry no inventories and only initiate your inbound supply chain and manufacturing processes after receiving a customer order. The brilliance of BTO is that you eliminate overproduction because you don't order material from your suppliers or manufacture finished goods until you have a firm customer order. As well, there is no need for warehousing or storage of any kind as you simply flow product to the customer upon completion of the manufacturing process. This is the definition of a pull system, where the customer order triggers all supply chain activities to fulfill the order, resulting in no overproduction. Supply chain professionals need to focus on eliminating overproduction because it creates other serious wastes such as excess inventory, excess warehousing, and excess transportation. BTO also eliminates the need for forecasting, which in turn results in the elimination of excess inventories due to inevitable forecasting errors. Eliminating the need of forecasting is another key area on which the lean supply chain professional needs to focus.

BTO is the perfect solution to a waste-free supply chain, but it requires a specific dynamic to succeed:

Total lead time must be less than customer order-to-delivery lead time expectations.

For instance, if a competitive environment states that customers expect to receive a product in 10 days after placing an order, a BTO process would require you to be able to order and receive material from your suppliers and then manufacture and ship the product to the customer in less than 10 days. Although many of us never will reach the state of perfect BTO, this needs to be the stretch goal for the lean supply chain.

When we are not faster than our customer, we are forced to guess (forecast) what they may need. When we guess, we will likely guess wrong. If we can reduce lead time, we will get closer to our customer demand and will therefore reduce the horizon of guessing. This will result in less waste of overproduction.

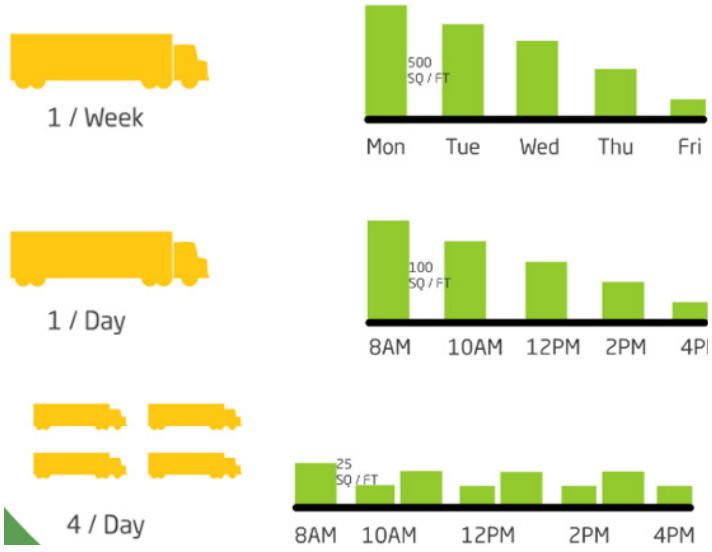
This was a guiding principle of our work on Toyota's inbound supply chain.

Velocity is a powerful tool to reduce lead time. From a tactical point of view, the only way to create velocity and reduce lead time is to move smaller shipments (lot sizes) more frequently. This was a goal during our initial work at Toyota.

We started with a planned minimum factory delivery frequency of four deliveries per day for any and all part numbers. High-volume suppliers (part numbers) may have delivered as many as 16 times per day. At no point, did we simply try to fill up a truck up to minimize transportation costs. The goal was to create velocity in order to connect to the factory and reduce overall lead time. Interestingly, a major benefit of velocity is a substantial reduction in inventory and all related inventory carrying costs.

But sadly, I admit that I was not a believer in velocity at first.

"How could this make sense," was a question I asked myself many times. In fact, I pressed the point to extremes with a senior Toyota coordinator who mentored me during my tenure.



Higher Delivery Frequency

"Show me the math, show me the numbers. This will cost too much in transportation," was a question I asked many times.

"No numbers needed, Robert – just believe it is right," was the answer I continuously received.

I did not relent. One day my coordinator finally got frustrated with me and said, "You want numbers? Look at Toyota's global performance in cost, quality, and delivery!"

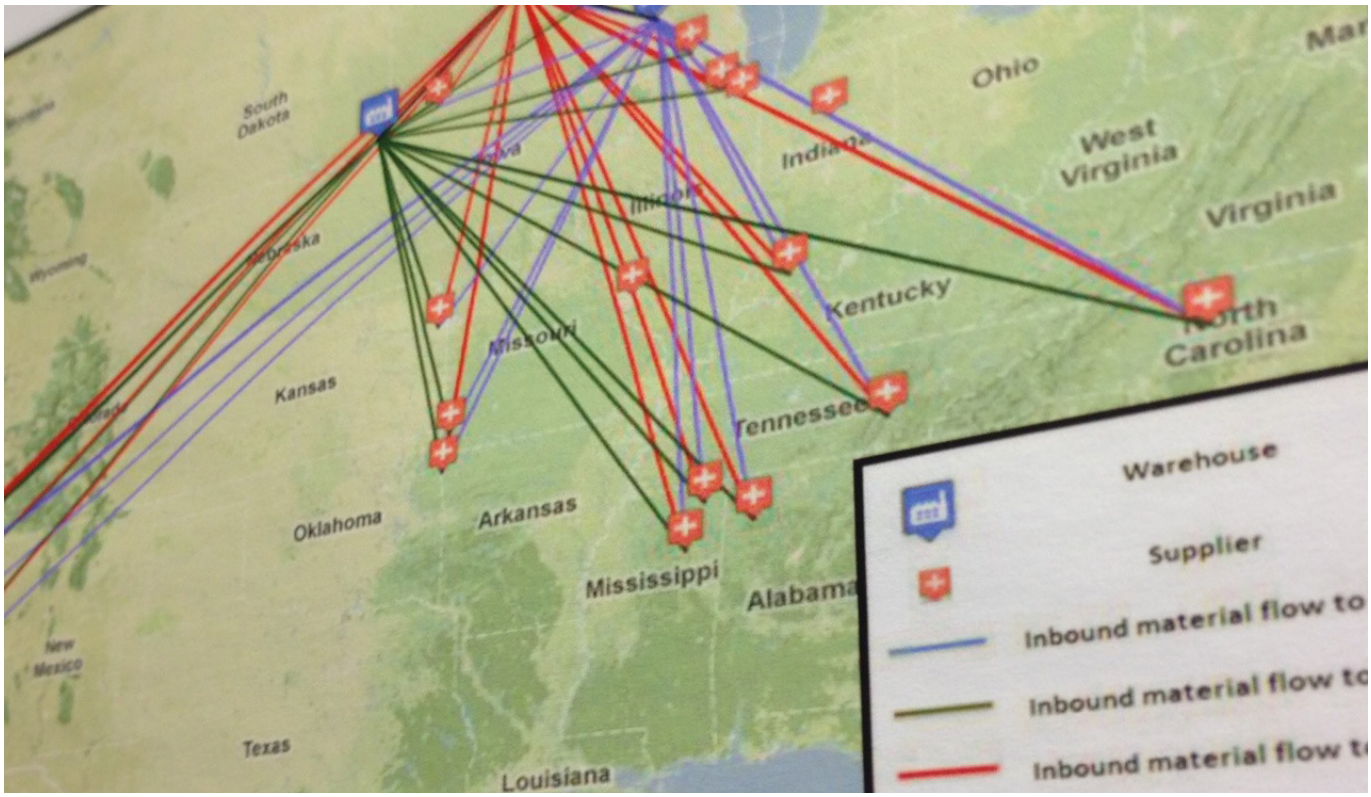
"What does that have to do with anything?" was my initial reaction.

It took years for me to truly learn the lesson. My head was in the weeds trying to solely minimize inbound transportation costs. While this is certainly a priority, my coordinator saw the big picture. This big picture started with customer demand, then went to the leveled production schedule, and then continued upstream to the supplier. The goal was never to minimize inbound transportation costs, but rather to create velocity to connect to the factory and the customer; ultimately to reduce overall supply chain lead time and total cost of the entire system. Ultimately, this leads to a reduction in overproduction – the grandfather of all waste.

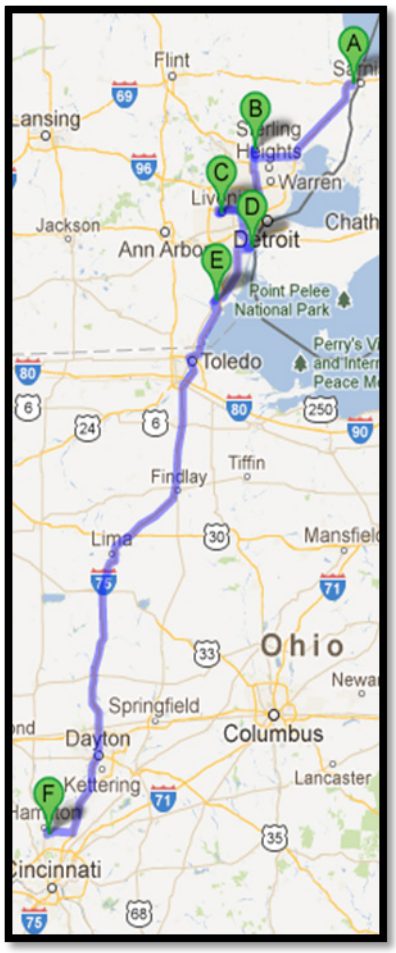
Manufacturing Plant Integration

Lesson 7: *Consolidate all volumes in the entire network and complete the hard work relative to information flow.*

Part cubic volume is the lean logistician's best friend for transportation network design. The more volume we have to build transportation routes, the more flexibility we have in order to consolidate material and drive velocity. While this may sound like "economies of scale" thinking, it's a harsh reality to driving velocity (increased delivery frequency) and managing transportation costs at the same time. In order to accomplish our velocity goals at Toyota, we needed to consolidate all freight that was available in the entire North American network. This meant collaborating with all factories to see the



See the entire network and not simply each factory in isolation



Milk Run

entire network and not simply each factory in isolation. Once an organization combines all volumes, velocity goals can be met and transportation costs can even be reduced in totality. We call this the "triple crown" in lean logistics where we increase delivery frequency, reduce inventories and even reduce transportation costs. In seems completely counter intuitive, yet I can tell you that it is possible. It requires a commitment to the hard work of standardizing processes across an entire organization.

The transportation aspects of factory integration (one network for multiple factories) of supplier volumes include milk run deliveries and cross docks to consolidate and redirect material from suppliers to specific factories. The goal is send one truck into a supplier and pick up all material for all factories that supplier services on the one truck. The truck picks up at the supplier and delivers to a pre-determined cross dock where material is unloaded and consolidated with other suppliers going to a specific factory. In doing so, pick up routes are optimized and line hauls to the factories are optimized as well. We achieve our frequency goals and have full trucks in the supply chain at the same time. Yet, this logistics technique of milk runs and cross docks is the relatively easy part of the work.

The challenging part of the work is not the physical flow of material but rather is in the information flow! Factory supplier codes need to be harmonized, part numbers need to be standardized, and suppliers need to be educated on how to pick and pack parts destined to multiple factories. A high frequency cross dock based transportation network will live and die on information flow. This is where the real work begins. Recognizing the benefits of this important work are immense.

Leveled Flow

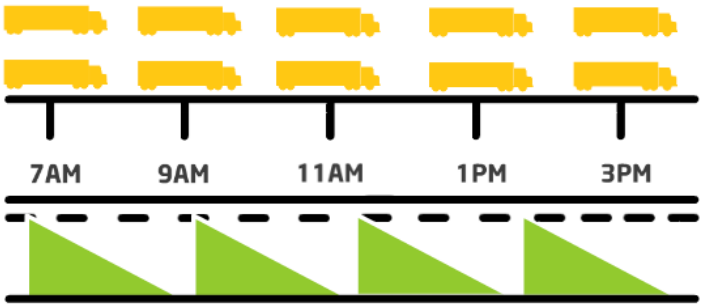
Lesson 8: *Level the flow of materials and implement a disciplined receiving schedule.*

Creating velocity is futile if you don't level the flow of material. For example, what's the point of going from one delivery per week to five per week if all deliveries arrive Monday morning? Velocity will reduce lead time and inventory when we level the increased frequencies over available working time. This gets to the heart of "takt," where we design the inbound network to connect to the factory in rhythm (or cadence) to factory needs.

A simple and powerful technique to accomplish this is the inbound factory receiving schedule. The receiving schedule is a simple tool to level part number deliveries over available working time. If we are unloading fifty trucks per week, we should service ten trucks per day. If we are working ten hours per day, we should service one truck per hour. Once this receiving schedule is built, we design the transportation system and parts to flow from suppliers to the factory using this receiving schedule.

Implementing a receiving schedule is an example of *standard work* in logistics. The point is that all flow of material is planned and coordinated. Plan versus actual condition can be measured and problems can be highlighted immediately. In many respects, the receiving schedule is the true logistics bridge to connect the external supply base to the internal factory. It is a fundamental technique that is required for lean logistics to be successfully implemented.

In my experience at Toyota, the receiving schedule was a fundamental technique to be used. It was non-negotiable and its use was a given. Therefore, I assumed it was basic in all organizations. History has now proven my thoughts wrong. In working with other organizations, implementing a disciplined receiving schedule can prove to be challenging. The main reason is that many receiving departments feel that truck arrival and flow of material is a chaotic process that cannot be managed. Disciplined material receiving requires trucks to arrive only during their scheduled arrival times (windows times). In the event trucks do not run on time, then the entire schedule will collapse. This should not stop us from implementing the receiving schedule to level the flow of material. At Toyota, we recognized this challenge and used the trailer yard to mitigate the disturbances and variances inherent with common-cause variation in the external transportation network.



Level Flow of Material

Trailer Yard Layout & Visual Management

Lesson 9: *Use asset and resource minimization to force process discipline and visual management.*

Of all the lessons I learned while supporting Toyota, one of the most important was relative to the trailer yard. The trailer yard is simply the space allocated for inbound trailers to be placed while waiting to be unloaded per their window time in the receiving schedule. I will never forget when our Toyota coordinators asked us how many trailer spots we needed, as we were required to self-pave these spots so they would be ready for the factory Start of Production (SOP) date.

Dock Portal

Date: Thu, 03/30/2017

Standing Appointment Mgt | Filter | Dock Schedule Visual

Save | Print Paperwork

	ETA	ETD	Load #	Hot	Carrier	Status	Pallets	Weight	Trailer Util%	Root Cause for Incomplete	Arrival	Start	Finish	Cancel?
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Inbound Recieving Schedule

As logistics engineers, we concluded that we needed about 200 spots. Unfortunately, the coordinators said we could only have 100 spots! We were dumfounded and confused. We thought, "How will we ever make this work?" We then attempted to make it work.

Our original request of 200 trailer spots did not require discipline to a process. A trailer would simply show up and find an empty spot in the yard. The approved limit of 100 spots would require an extreme amount of process discipline. Each trailer spot would need to be named. Each inbound route would need to be allocated to a certain spot when it arrived at the factory, and it could only stay in that spot for its allocated time. We would need that spot for another planned route when it arrived to the factory. In other words, we had to "turn" the trailer yard in the same way you would turn inventory in a warehouse. While this may seem ludicrous considering all the space we could have paved in the massive cornfield, having a minimum amount of trailer spots forced us to plan to the smallest level of operational detail.

In addition, visual management was naturally created. For example, if a route arrived and the pre-planned trailer spot was not open, that meant that a trailer had not been shuttled to the factory unloading dock per the plan. Therefore, the trailer yard itself highlighted abnormalities with the receiving schedule, which highlighted potential problems with the material receiving function inside the plant. This was truly a system of visual management cascading into several aspects of the operation. This was my first fundamental lesson in visual management. That is, that true visual management connects people to processes and processes to processes.

Trailer Yard

Quality at the Source & Discipline of Process

Lesson 10: *A lean logistics system focuses on quality at the source and error proofing all critical processes as far upstream in the supply chain as possible.*

Quality at the source is defined as "getting it right the first time." In logistics, this manifests itself in "getting it right as far upstream in the supply chain as possible." In most inbound logistics networks, suppliers receive an order and they ship the order. When the parts arrive at the factory, the factory hopes it receives what it ordered. If it doesn't, then an expedite process will ensue and the factory may shut down. This is not quality at the source. Getting it right the first time means that we have a way to ensure that suppliers are shipping the right parts at the right time prior to the supplier loading the parts on a truck. This process is known as "driver pick up verification."

This verification process is completed by the truck driver who is responsible for picking up the parts. Acting as an agent for the manufacturer, the driver is trained to verify all perfect-order components of the supplier order. To accomplish this, the driver is armed with a manifest that outlines in detail what the supplier is expected to ship that day. Prior to the freight being loaded on the truck, the driver verifies that the order staged for shipping has the right parts in the right quantity in the right packaging with the proper labeling and any other variables critical to quality of the process. By doing this, the driver recognizes any red flags. For example, if the supplier is supposed to ship 20 steering wheels but there are only 18 on the rack, the process is stopped immediately by the driver. Referred to as "Jidoka" in the *Lean Lexicon*, this is the act of stopping the process immediately when

The LeanCor Logsitics Control Center

an abnormality is detected. Hence, we uncover an error and avoid a defect. In this case, the driver would inform the supplier of the parts shortage and a solution would be developed on the spot in real time.

Compare this process to one that has no mistake-proofing mechanism in place. The driver would arrive at the supplier and have the truck loaded with whatever the supplier had ready to ship at the time. The trailer would arrive at the manufacturing facility and, upon inspection, would realize there are two steering wheels missing (if detected at all). However, at this point, it is too late, and a parts shortage will likely result. This could possibly shut down the manufacturing line, and at the very least, result in an expensive expedite.

Quality at the source teaches us to detect errors as quickly as possible. In logistics, this means we need to have mistake-proofing tools in place for all critical processes. In practice, this means we should look at processes as far up the supply chain as possible. The goal is to detect and resolve issues prior to them burdening the organization.

We must develop processes and train our drivers to verify parts on a supplier's shipping dock before the parts are loaded on a truck. While this may seem simple in concept, it can be difficult in application.

For driver verification to take place, we need to collaborate with suppliers, create stability with training, and keep trained drivers on the team. We need a support structure of logistics coordinators to perform the track-and-trace function while managing the routes.

In subsequent years with my work at LeanCor in our 3PL division, we have developed web based tools and technologies that support quality at the source and Advance Shipping Notice (ASN) processes. These processes, combined with logistics control center capabilities, drive stability in the supply chain.

Lessons Learned & Conclusion

It would be a gross understatement to say that my Toyota experience was good for my career. It literally defined who I am today as a supply chain professional and business person. Today, LeanCor Supply Chain Group helps companies drive lean thinking in their logistics processes and supply chains through training and education, consulting, and managed transportation (3PL services). Many of the principles I learned in those days are the guiding principles we apply to other organizations. Processes and tools can be different to meet the unique needs of an organization, but the guiding principles should be consistent in lean logistics. These are ***pull replenishment, velocity, leveled flow, and lead time reduction.***

From a tactical point of view, the lessons I learned and the lessons I urge all organizations to embrace are:

Lesson 1: You must have guiding principles in place to support supply chain and logistics strategy.

Lesson 2: Supply chain collaboration is about understanding the strengths and weaknesses of all supply chain partners while teaching and working with them.

Lesson 3: People development and process planning are critical to initial and sustained success of any operational undertaking.

Lesson 4: For any big initiative, develop a cross-functional team and perform the process manually the first time.

Lesson 5: Pull starts with customer demand and then dovetails into the production schedule and upstream to the supplier.

Lesson 6: Reduction of lead time needs to be a goal of the logistician. We must believe in "economies of time."

Lesson 7: Consolidate all volumes in the entire network and complete the hard work relative to information flow.

Lesson 8: Level the flow of materials and implement a disciplined receiving schedule.

Lesson 9: Use asset and resource minimization to force process discipline and visual management.

Lesson 10: A lean logistics system focuses on quality at the source and error proofing all critical processes as far up in the supply chain as possible.

ABOUT THE AUTHOR

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Robert Martichenko is the Chief Executive Officer and Founder of LeanCor Supply Chain Group, a trusted partner with a mission to advance the world's supply chains. LeanCor focuses on comprehensive organizational transformations through three integrated divisions: LeanCor Training and Education, LeanCor Consulting, and LeanCor Logistics.

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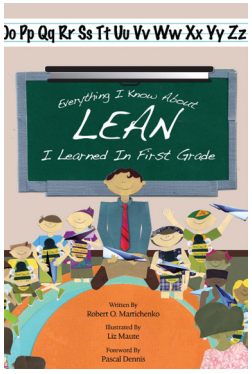
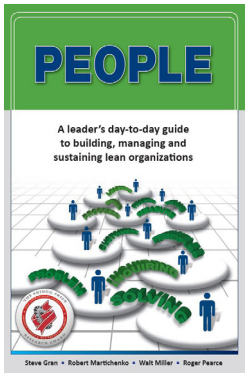
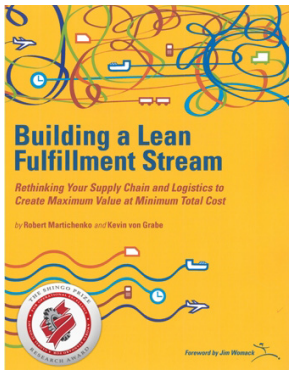


Lean Fundamentals and Leadership Training





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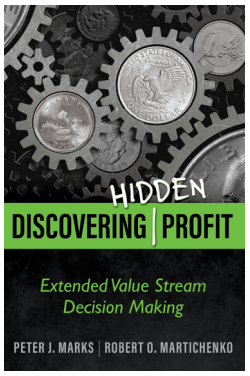

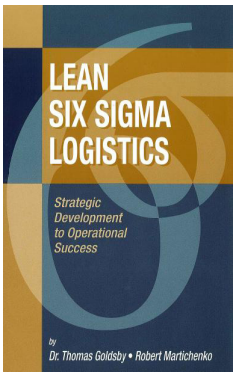

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