

SECORA

Case Study: Automotive Industry

Rail Demurrage

Managing Rail Car Flow and Minimizing Demurrage Costs through Process Optimization



SECORA

Background

This case study describes a project that was led by a current Secora member during his previous career in the US automotive industry. It demonstrates the skill set and methodologies Secora utilizes in its projects.

The project's purpose was to reduce rail car demurrage for the client's company.

Rail cars are used to move material (parts) from suppliers to the automotive assembly plant and supporting facilities. Demurrages are tariff charges assessed for detaining freight cars beyond their specified time limit. Demurrage charges are billed to the assembly plant from the Railroad when rail cars are held at the assembly plant or supporting facilities beyond the contracted amount of time.

Project Objectives

The project objectives were to:

- Reduce rail car demurrage charges by 50%, from \$374k to \$187k per year by:
 - Identifying and reducing process inefficiencies leading to "aged" rail cars in the facility's rail yard which create demurrage charges from the Railroad
 - Developing a control plan to enable the process owner to monitor and manage the flow of rail cars to ensure demurrage charges are minimized
 - Improve usefulness of daily rail reports through better formats and contents
 - Create control charts for tracking rail car flow
 - Improve clarity and usefulness of monthly bills
 - Automate rail dock supervisors rail car selection and tracking process

Scope

The project scope included all rail cars that supported the assembly plant production, some of which were unloaded and reloaded with empty racks at a local Material Support Center (MSC).

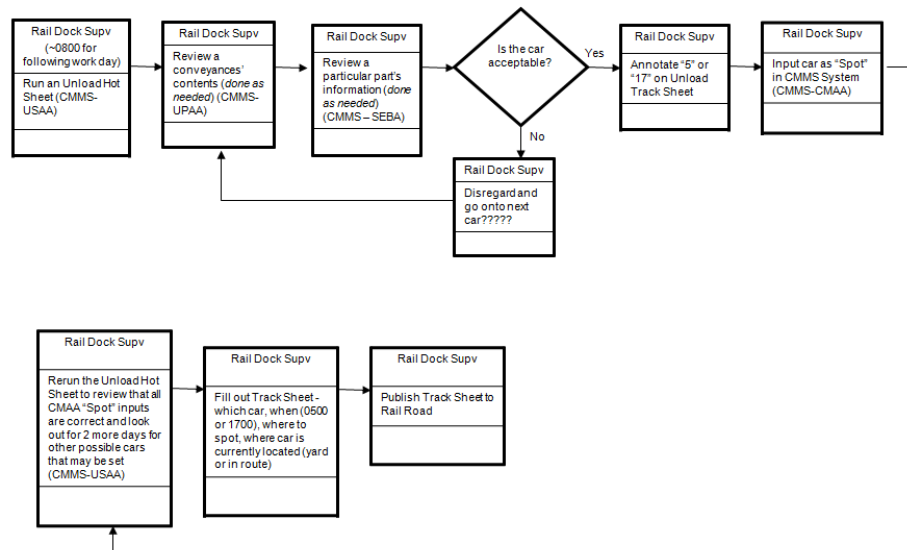
The process steps considered were those from when the rail cars arrived at the local yard, at which point they are accessible to the receiving facility, until the rail cars are released back to the Railroad.

Supplier	Input	Process	Output	Customer
Providers of the required resources	Resources required by the process	Top level description of activity	Deliverables from the process	Anyone who receives a deliverable from the process
		Requirements		Requirements
		Railroad drops rail cars in local yard (which makes cars available for spotting)		
Railroad	car (full of parts)	- release - Supplier production - Railroad	car (full of empty racks)	released 'on time' - no revenue interruption (less than 2 days) Railroad
Material Suppliers	needed parts (not needed parts)	production scheduled	empty racks	racks required for next cycle (rail car full) Material Suppliers
Material Suppliers	asn (no asn's)	proper administration	parts in Assembly Plant records	correct quantity of correct parts Assembly Plant
		Railroad spots rail cars for unload / reload		
Assembly Plant	manpower at Assembly plant	authorization	completed work	no excessive workload Assembly Plant
Railroad	computer program / reports	data/process integrity	bill for demurrage	\$0 dollars of demurrage costs Assembly Plant
Auto Company	computer program Auto Company	data/process integrity		
		Rail Dock Supervisor submits 'release' of cars to the Railroad		

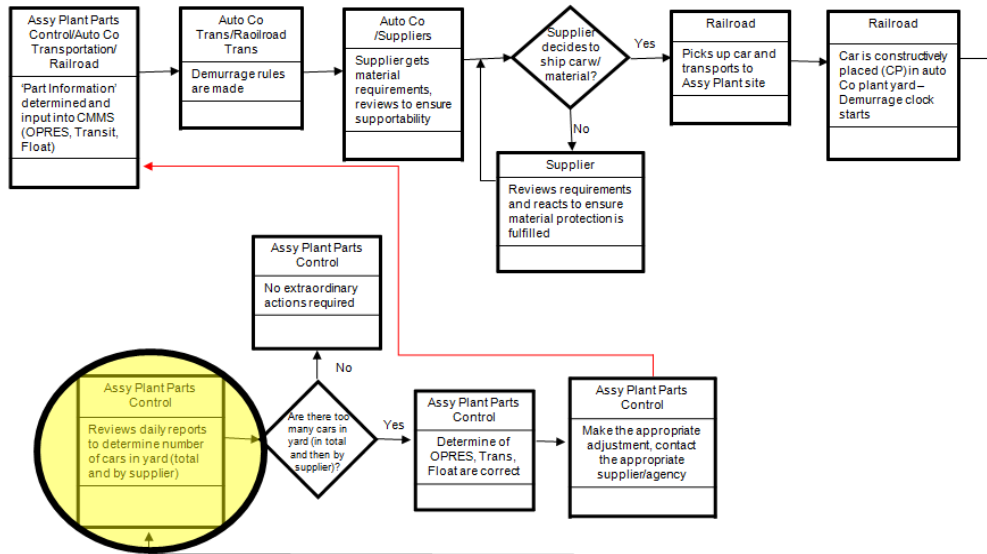
Process improvement

In order to improve the process and to achieve the objectives set by this client, the project team had to review the current process at the main assembly facility. The company had existing process documentation in place which was reviewed and amended:

Process Map (Before)



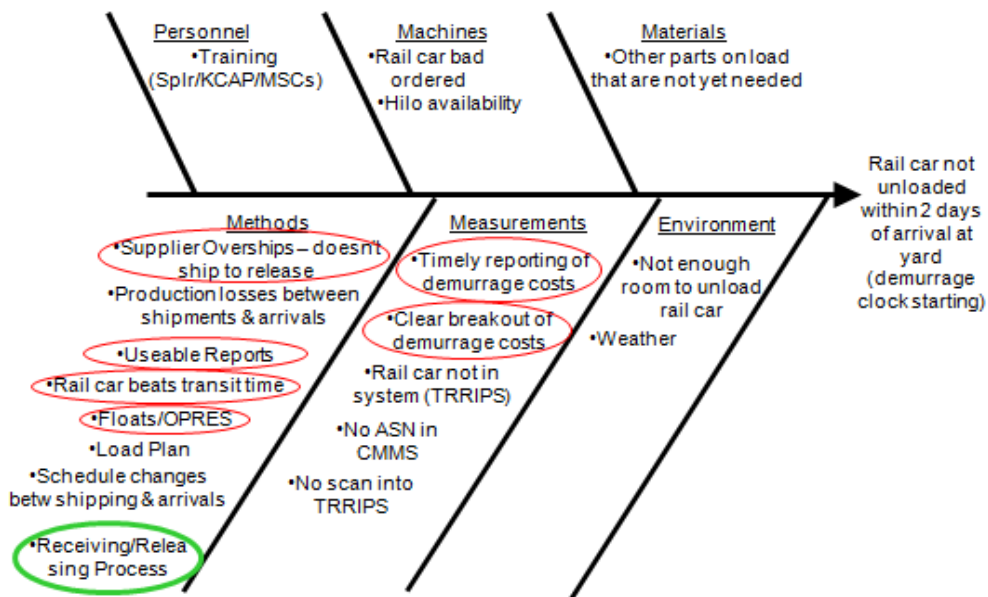
Process Map (Revised - Improved):



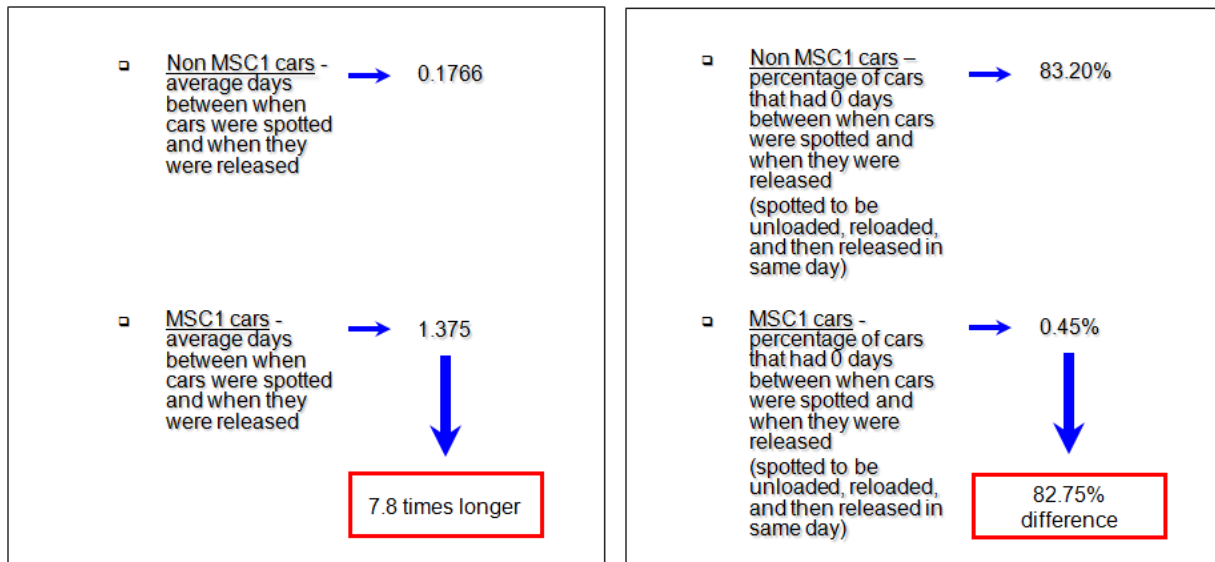
The team decided to collect data that would break out demurrage charges by suppliers and reveal the characteristics of each of the process steps. After gathering and reviewing data the team discovered that the majority of the demurrage charges were occurring at the MSC's.

A cause and effect analysis was completed to determine what part of the MSC's process was likely contributing the most to the problem. The team determined that rail car requesting and releasing steps were likely one of the largest contributors to the problem of cars aging on the demurrage clock.

Cause and Effect Diagram



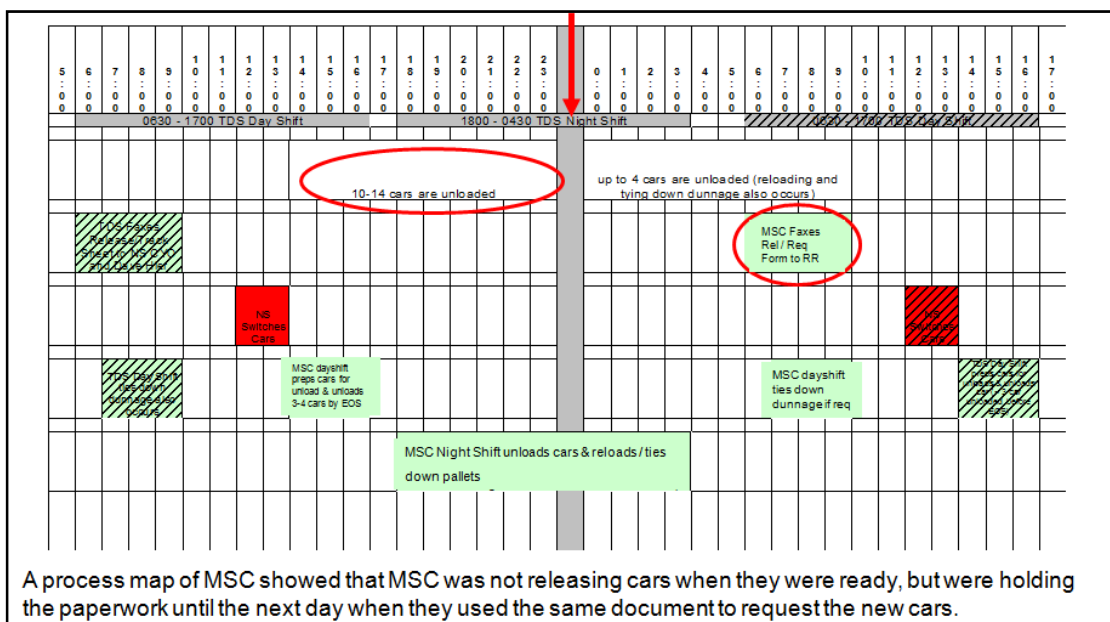
Additional analysis of the data showed that the MSC's were taking 7.8 times longer to request and release rail cars than the main assembly facility (shown below).



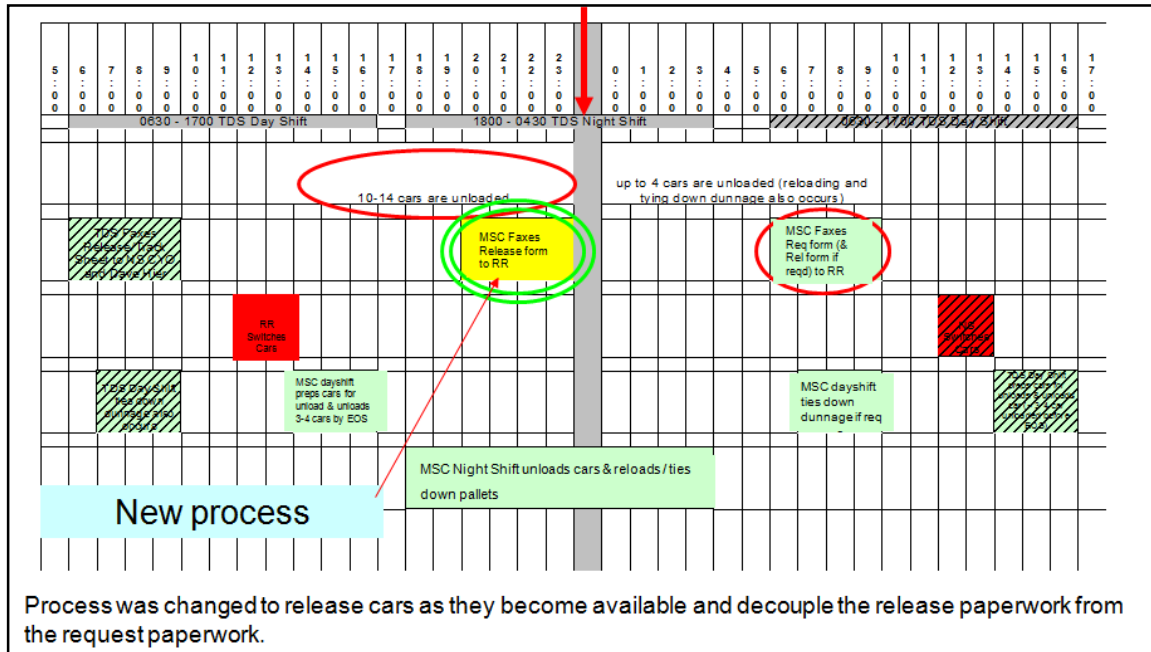
Billing data showed that there was a distinct difference in “paperwork” processes between the Assembly Plant and MSC1.

Next, the team focused on the process of the MSC's and saw that their car requesting and releasing processes differed from the main assembly plant processes. Once this was realized a change was made at two MSC's to align the two processes.

Sub-Process Map (Before):



Sub-Process Map (Revised - Improved):



After this improvement was implemented the demurrage charges were eliminated.

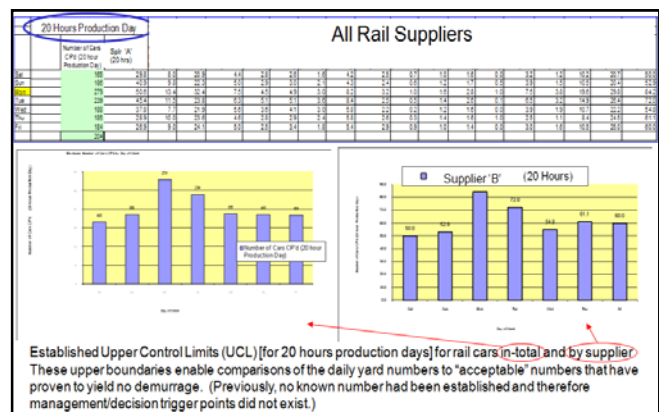
Putting in place controls

The next step for the team was to develop a procedure to enable the process owner to have sufficient vision of the rail car flow to be able understand the ongoing "state of the yard". The process owner would then be able to proactively adjust rail parameters to head off demurrage conditions. With the help of the process owner the team developed a procedure and supporting data requirements.

Process Control Plan

Project Action/Control Plan					
Project: Demurrage Reduction			Black Belt:		
Process Owner: MC Manager			Date: 11 April		
What	How	Who	When	Deliverables	
(Action to Take)	(Action Steps)	(Accountable)	Start	Finish	
Review RR Daily Report to determine if the number of rail cars at site is below Upper Control Limit (UCL)	Receive data in Excel file from Railroad automatically at 05:30 Mon-Fri	Material Control (Process Owner, or Material Control Unit Supervisor in his absence)	0600hrs (Mon-Fri)		
Run Master file Macro					
Determine if total number of rail cars at site violates the UCL for the day of the week by comparing to "Number of Cars CP# Chart"					
If so, use the RR Daily Report numbers to determine which suppliers are over UCL for the day of the week by comparing to "Number of Cars CP# by Supplier Chart"					As needed make changes to CIMMS inputs and/or contact supplier
					Report out at SAM meeting
					Send RR Daily Report to Rail Dock Supervisors, Superintendent, and MPS's
Review RR Daily Report with CIMMS data to identify "lost cars to yard"	Review RR Daily Report as part of daily Track Sheet preparation	Rail Dock Supervisor	0700hrs (Mon-Fri)		Add lost cars to track sheet as appropriate and/or notify Material Control Department to help resolve issue
Release (RE) Supplier A rail cars from yard to RR	Fill out top portion ("cars ready to be pulled" section) of Rail Request Automotive Pull and Spot Report. Use all cars that are to be pulled on the next in-bound switch	MSC at MSC/1 Office	2300hrs (All production/RR unloading days)		Fac D10 Rail request Pull and Spot Report to RR

Process Control Chart



Project Summary and Outcome

The process mapping, data gathering and analysis identified that the processing steps of the rail request forms for the MSC's had built in delays that were causing late releases of every car that was processed at the MSC's.

Additionally, due to poorly designed reports and monthly bills the process owners and users were unable to monitor, understand and manage the daily flow of the rail cars.

The following improvements were made:

- Identified steps in the rail receipt and release process that contained excessive time, and subsequently revised the step to eliminate excessive time.
- Developed a control plan and supporting data tables to enable the process owner to monitor and manage the flow of rail cars to ensure demurrage charges are minimized.
- Revised the format and contents of the daily rail reports to improve the reports usefulness.
- Improved clarity and usefulness of monthly bills. This helped to provide accurate and understandable information to ensure verification that the process is running effectively.
- Automated rail dock supervisors' rail car selection and tracking process. This helped to provide readily available data for analysis.

Applying process optimization methodologies, the project achieved a reduction of demurrage charges by 100% - from \$374k to \$0 per year.