

To: Mattress Recycling Council California, LLC (MRC)
From: Group 50 Consulting
Date: May 2020
Subject: Executive Report on Transportation Project for MRC

Thank you for the opportunity to work on this project with you. This executive report will cover the breadth of the work we have done in California over the last 8 weeks, our observations, and our prioritized recommendations.

Situation Analysis

The MRC is a non-profit organization that provides recycling services for the mattress industry in states that have mandated mattress recycling. MRC relies heavily on third-party vendors to operate the recycling transportation system. Annually, they pick up, deliver, and recycle 1M mattresses and box springs from 200+ collection points in California and deliver to 11 recycling centers. One of the capacity and logistics challenges is the seasonality of recycling which creates inefficiencies between the collection points, the trucking companies, and the recycling centers. MRC believes there are opportunities to improve the logistics involved in this process. As a result, MRC engaged Group50 Consulting to analyze the current processes and make short, medium, and long-term recommendations to continuously improve its operations over time.

Statement of Work

Group50 was engaged to accomplish the following deliverables:

1. Interview MRC personnel in Los Angeles
2. Review of MRC strategy and long-term goals
3. Analyze the logistics planning and execution processes used by MRC staff to properly establish a current view of operations
4. Create a Value Stream map of internal processes
5. Review the use and efficacy of the Re-TRAC Connect data tracking tool
6. Plan visits to recycling centers and collection points in the Bay area, Fresno and Ontario
7. Document processes at each center and collection point
8. Collect data on what works and what does not work in the process
9. Acquire field recommendations for improvements
10. Create Value Stream maps for each area with the intent of identifying common process steps, wasted effort and best practices at each location
11. Identify short, medium, and long-term recommendations for improving operations in California

12. Recommendations for the future

This summary provides highlight of these deliverables.

Summary of Work Conducted

During this project, Group50 utilized 3 consultants, who are subject matter experts in business processes, operations and transportation. During the project period, we did the following things to create an understanding of MRC's business to test our observations and recommendations:

1. Review of data provided by MRC
2. 1+ hour interviews with 12 MRC personnel
3. 2 ½ day kick off meeting with MRC personnel in which we defined the internal processes used by MRC personnel to operate in California
4. On-site visits or interviews with every MRC recycler
5. On-site visits with multiple collection points
6. Interview of primary transportation vendors
7. Meetings with 4 Transportation Management Systems (TMS) companies

During the project we analyzed business process workflows via Value Stream Mapping, which is a process of detailing the workflows in a business process.

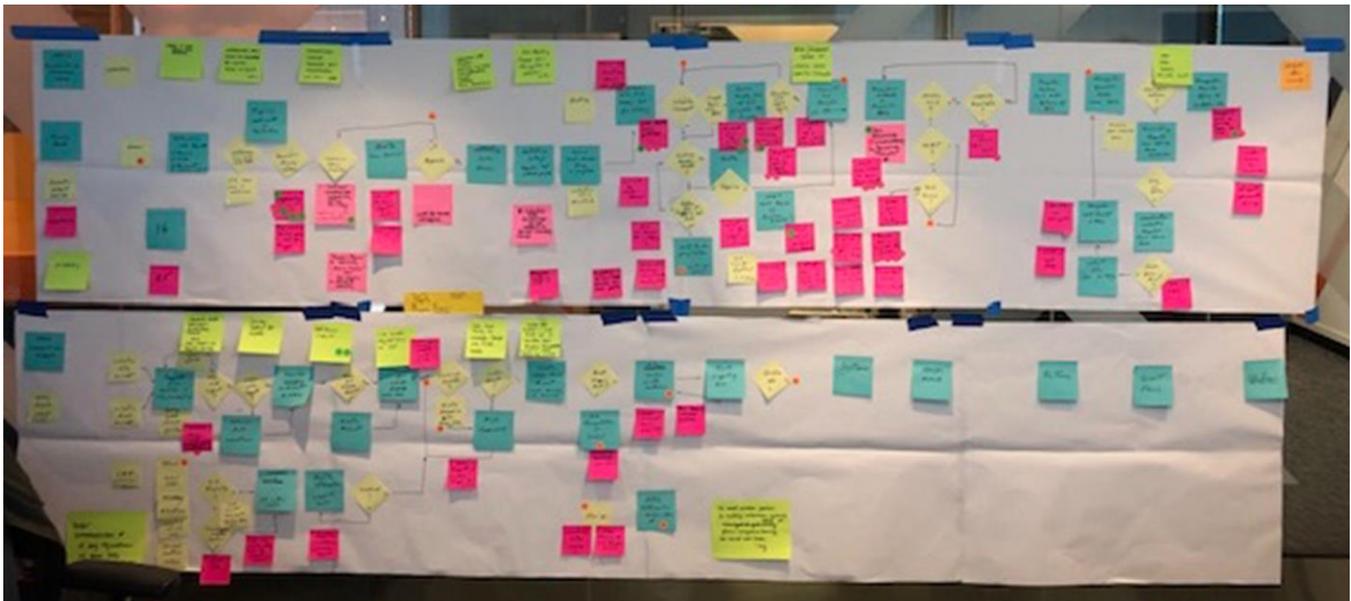


Photo 1: [Value](#) Stream Map defining workflows. Red stickers are the identified improvement opportunities.

Observations from the Value Stream Mapping:

1. MRC Coordinator requires close coordination of site, carrier and recycler to accomplish the activity – there is very little system or automation support to aid in this coordination
2. Coordinator activity is limited to the bandwidth of the coordinator – additional sales or requirements to increase events or site activity is time constrained – Not scalable

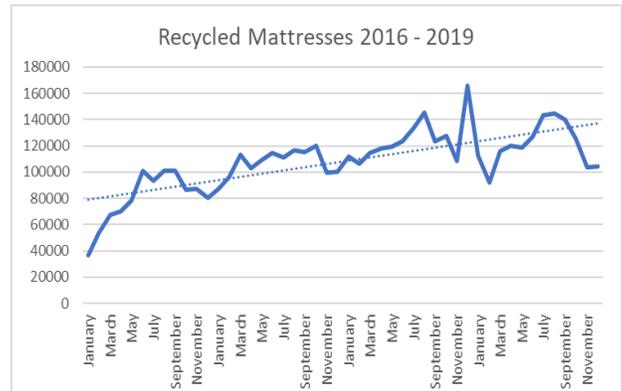
3. Failure of the site or carrier to perform to requirements creates stress on the system and reduces coordinator effectiveness
4. Division of responsibilities is required to improve overall coordinator effectiveness
5. Additional information technology automation support or personnel is required to grow the recycling effort beyond current constraints
6. Documentation of operational processes and procedures must be enhanced, including coordinator training

We also performed a capacity analysis and analyzed data from multiple MRC systems:

1. Salesforce – Customer relationship management software
2. Great Plains – Enterprise level financial and reporting systems
3. ReTRAC – Operations and recycling data collection system.

This information and data analysis form the basis of our report. One of the first analyses we did was to understand the volume and growth of the business over the last four years.

MRC has done a great job of growing its mattress recycling business from 957K units in 2016 to 1.5M in 2019. As with every company, there is a service volume at which the existing systems and infrastructure struggles to keep up with that growth and aren't capable of servicing the next phases of growth. We call these inflection points in a business's sales lifecycle which require MRC to rethink its business processes with a focus on: growth/expansion and reduced friction between MRC, Collection Points, Recyclers and Transporters.



Future growth is not forecasted to be as great as the previous four years, so the slope of the growth curve shown in the graph above will begin to flatten out.



MRC handled 14.4K collection hauls from 220 collection points in 2019. By every measure, this is considered a high-volume supply chain that has many complex variables. During 2019, there were multiple issues such as a fire in a recycling plant and excess supply to available capacity that caused a large number of diversions, which in turn increased MRC's cost and made the

entire system less effective. This is primarily due to the significant seasonality in the supply and demand curve for MRC's business as shown in the graph to the right.

The volume in 2019 ranged from a low of 92K units in February to a high of 144K units in August which is a 56% variation in supply and demand. This variation strained the capacity of the recyclers leading to further downstream issues in MRC's supply chain. Seasonal variations of this magnitude require careful capacity planning.

The workflow for operating the MRC model is that a collection point calls a trucking company to schedule a pickup and the trucking company may or may not call a recycler to schedule a delivery. Even in the case of a scheduled appointment, a brief study showed trucking companies have significant variation in their ability to adhere to their appointments making it difficult for the recyclers to handle the deliveries in an orderly fashion, thereby increasing the cost to MRC and frustrating the recyclers.

In the transportation world, there are multiple key performance indicators (KPI's) that provide insight to the efficiency of core operations and the effective utilization of equipment and resources. The KPI's that we thought were important for this project were: \$/mattress, \$/mile, miles/trip, trip cycle times, % trailer fill rates, % diversions, late/early/no-show by transporter and several others. We wanted to see how well each of the transporters performed for each lane and identify the costliest lanes either by cost per mile, distance traveled or cost per mattress. We were not able to determine these from the data that was provided by MRC.

MRC has three disconnected systems: Great Plains, ReTRAC and Salesforce. The data in these systems are not tied together with a common identifier (such as BOL#) that allows for easy collection and analysis of critical operational performance.

While we were not able to get the KPI's we were looking for, we were able to look at transportation from a different angle. Working with the recyclers and using data from ReTRAC, we were able to create a monthly capacity model for 2019. The ReTRAC data required some modifications and manipulation to accomplish this analysis which should be fixed. MRC has already taken several steps to improve data integrity and visibility.

We typically view full capacity to be defined at 90% utilization of total capacity to account for downtime, unexpected problems, vacations, shutdowns, etc. Several of the recyclers come close to maximum capacity during the busiest part of the year, which is typically July and August, but only 1 is beyond what we would consider full capacity.

Based on this analysis, as volume continues to grow, there will be a need to review the lanes that supply several recyclers during the busy season with planned diversions.

While this is good news, monthly capacity utilization may mask issues on a given day. We looked at the daily capacity utilization rates by recycler and identified the number of times their daily capacity was overutilized.

Every recycler experienced days where deliveries were greater than their capacity except for one. The analysis also shows that deliveries over-capacity were not clustered around a specific day of the week as earlier thought. A recycler's ability to handle deliveries higher than capacity is dependent on their buffer storage. Every recycler has between 3-5 days of buffer capacity to handle over supply on any given day. This buffer capacity and how the individual days are clustered would further refine this analysis.

This analysis indicates that capacity planning is critically important to leveling supply to recyclers during the busy period via lane redefinition or planned diversions.

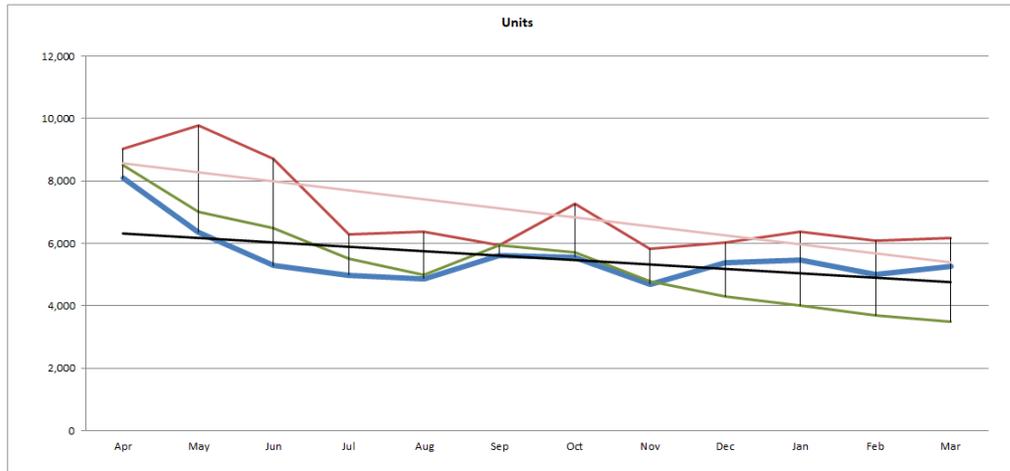
Recommendations

There are opportunities for MRC to streamline and operate its transportation system. In all projects, we find far more opportunities for improvement than can be reasonably managed if taken individually. After studying the inputs and analysis we are making building block recommendations that will allow for an appropriate change management plan to help MRC build for the future. The following recommendations are divided up into short, medium and long-term categories.

Short Term

1. Improved data collection and analysis by tying data in Re-TRAC, Salesforce and Great Plains together via the BOL#, Lane# and % fill or trailer size. The last two pieces of information should be added to every BOL that is reported in Re-TRAC. This will allow MRC to create operational reports and dashboards that will provide better insight to operational performance in line with the KPI's that were recommended earlier in this report. (MRC OPS has already taken initial steps to improve this)
2. Reduce the scope of the coordinator's role to market facing activities focused on business development for collection sites and events. MRC should have an internal expert in vendor management and transportation. This person would be responsible for the next 3 recommendations.
3. Work with each recycler to develop an in-depth capacity model.
4. Implement a Sales & Operational Planning (S&OP) process using Item 3 as the basis for planning supply and demand. In its most basic form, a S&OP process would allow MRC Operations to prepare a supply and capacity forecast on a 12-month rolling basis. Once done, MRC Operations can sit with each recycler and transporter to discuss how each vendor will support the forecasted supply of mattresses for every month. This process would give vendors the ability to plan their resources (people, trucks, equipment,

operating hours, cashflow, etc.) for every month and in those cases where their capacity is insufficient, MRC operations will be able to plan diversions in advance for specific lanes, making the entire system more efficient. An example of a S&OP forecast is shown below:



All Summits	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	YTD	Mthly Avg
Actual Units	8,078	6,350	5,283	4,992	4,869	5,615	5,562	4,690	5,374	5,457	5,007	5,279	56,166	6,241
Plan/Rfcst	9,035	9,779	8,699	6,295	6,369	5,952	7,273	5,834	6,027	6,378	6,080	6,162	71,742	7,971
Forecast	8,500	7,000	6,500	5,500	5,000	5,952	5,700	4,800	4,300	4,000	3,700	3,500		
% to Plan	89%	65%	61%	79%	76%	94%	76%	80%	89%	86%	82%	86%	78%	78%

The above graphic depicts a typical planning method showing actual performance (Units), the dynamic plan/reforecast, the original forecast and the % deviation. This example is for a specific product but could be used for each recycler and transporter. Review of the supply and demand requirements is typically repeated monthly to provide all vendors with the latest supply and demand information. With our help, this could be implemented in 30 days or less which will allow MRC Operations to plan the upcoming busy season.

5. Ask all recyclers to track transporter performance to scheduled dock times and use this information to immediately start discussions with transporters on improvement goals and objectives.

Medium Term Recommendations

6. Complete a feasibility study of payment per pound rather than per unit processed. The study should evaluate logistics for collection site, recycler and inventory management.
7. Create basic service level metrics for each vendor contract so they know how their performance is going to be measured.
 - a. Typical measures for a trucking company are on-time deliveries (dock appointments), cost/mile, surcharge measures, cost reduction goals, etc.
 - b. Recycler performance metrics could include throughput, inventory accuracy and other objectives that MRC would deem appropriate
8. Begin a project to better document all internal and external workflows and processes including onboarding packages for recyclers and collection points.

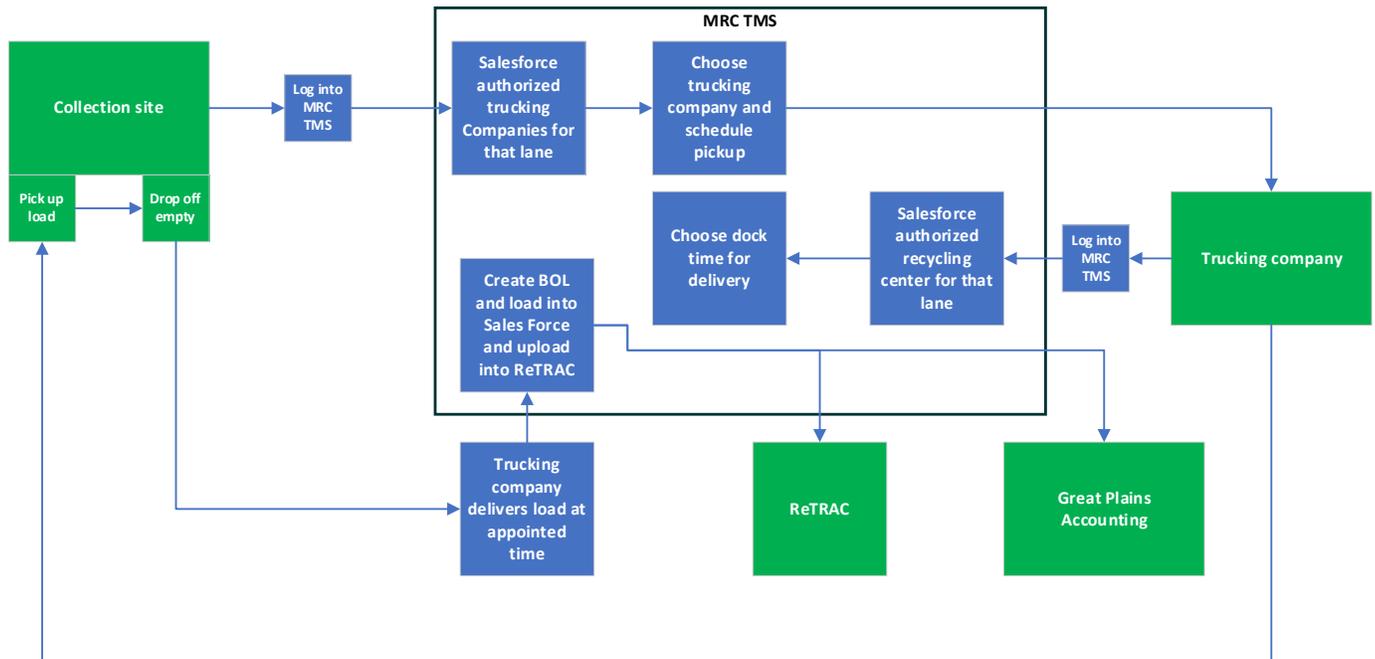
9. Set-up a vendor management program that includes the following:
 - a. Vendor scorecards that record performance to contract and other measurables on a quarterly basis
 - b. Yearly planning meetings with each vendor to define the scope of performance improvements being requested for the following year
10. Complete a new lane study based on two different scenarios:
 - a. The incremental recycling capacity available this year
 - b. Addition of a NorCal consolidation point
11. Create a process for routinely requoting lanes based on cost and transporter performance
12. Work with ReTRAC to develop an automated methodology for uploading BOL's and adding reporting fields

Longer Term

13. Consider adding subject matter experts in transportation and recycling to oversee program and strategies
14. Consider designing and implementing a data tracking approach to integrate the processes and systems that are currently used including:
 - a. Salesforce
 - b. Re-TRAC
 - c. Great Plains (accounting software)
 - d. Collection points scheduling a pickup with a transportation company
 - e. Transportation scheduling with recyclers
 - f. Recyclers setting dock appointments
 - g. BOL procedures
 - h. Human error
 - i. Tracking incremental costs – transportation and demurrage
 - j. Lane cost and optimization

These activities are disconnected with no single point of truth that allows for efficient functionality and real time reporting.

During the project, MRC and Group50 interviewed multiple Transportation Management Systems (TMS) companies to understand the current state of TMS technology and capabilities such as automating BOL's, managing traffic, tracking lanes, etc. Two of the companies had platforms compatible with Salesforce which would make system integration easier. By integrating Salesforce and TMS together, it is very possible that all MRC customers (collection points, recyclers and transportation companies) could, in real time, seamlessly make pick-up requests, see available dock times to make deliveries, automate the creation of BOL's and automatically report them into Re-TRAC. At this point, we are not making any recommendations on who MRC should use for their TMS, because our interviews were exploratory. By taking this approach, MRC could eliminate most of the manual labor that is required by all parties and significantly improve data integrity and operational performance. This would significantly reduce the cost of operations and increase the efficiency of the entire system. The technology architecture is shown below and can accomplish the above recommendations:



- MRC TMS sits on top of their Sales Force instance
- The collection sites log into the MRC TMS and request a pickup which is transmitted to the appropriate trucking company
- The trucking company logs into MRC TMS to find an available dock time at the appropriate recycler. If one isn't available, they check the secondary recycler, etc.
- The trucking company schedules the load to be delivered to the recycling company, takes an empty trailer to the collection point, drops it off and delivers the load at its scheduled dock time
- The recycler receives the load, updates the BOL, enters it into the TMS which then transmits the BOL to ReTRAC
- All transactions are tied to the Sales Force accounts for the collection point, the trucking company and the recycler, resolving data connectivity issues

MRC relies exclusively on the capabilities of their third-party vendors for the execution of collection, transportation and recycling. As the volume of recycled mattresses has grown, this approach is showing signs of strain. We believe that MRC needs to develop a more disciplined approach that does a better job of the high-level coordination of its supply chain and vendors through the implementation of the business processes we have outlined in this report. In the near term, MRC should consider a building block approach. Important building blocks are shown below:

1. Reorganize data
2. Creation of an operational dashboard
3. Completion of the payment on weight vs. quantity study
4. Completion of a lane study because of the new capacity coming online in 2020
5. Adding additional staff to focus on operational performance
6. Design and implementation of a Sales and Operational planning process
7. Creation of new contracts for recyclers and transporters that include service level metrics
8. Creation of vendor scorecards
9. Creation of a requirements document for a TMS
10. Design of the future system architecture

Moving from MRC's current technologies and data integrity to more integrated systems will require a significant amount of work, outside subject matter experts, a project plan and project management.

Thank you again for providing Group50 the opportunity to work on this project.

Sincerely,

Jim Gitney, CEO, Group50