



# Final report

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## Faster Fresher Flows in Red Meat Food Processing

Project code: P.PSH.1376

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Date published: 30 April 2023

PUBLISHED BY  
Meat & Livestock Australia Limited  
PO Box 1961  
NORTH SYDNEY NSW 2059

This is an MLA Donor Company funded project.

Meat & Livestock Australia acknowledges the matching funds provided by the Australian Government to support the research and development detailed in this publication.

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## **Abstract**

Coles RROA proposes to customise TilliT, an open-source suite of applications designed to improve order enhancement through pick and pack integration to achieve faster, fresher, flows in food processing and logistics specific to red meat. The goal of the project is to reduce the order cycle time to retail shelf by one day, with the general business rules and methodologies employed, available to share with the wider red meat industry.

Three phases of order enhancements were planned for RROA's Faster Fresher Flows (FFF) initiative, which included;

Phase 1 – Pick and Pack Integration

Phase 2 – Automated order, inventory and transport optimisation management system

Phase 3 – Inbound capacity increase with associated data integration with 3<sup>rd</sup> party providers

## Executive summary

### Background

Coles RROA facility process over 550 tonnes of red meat each week servicing over 700 Coles Supermarkets across the eastern seaboard. Maximising freshness of meat products and optimising transport is a key enabler to ensure reliable and affordable supply of red meat to millions of customers.

The current approach to order inventory and logistics management for red meat is currently very manual utilising spreadsheets and manual data entry between disparate systems in the supply chain. This causes delays and results in errors which have downstream impacts for fresh red meat packaged products.

It is proposed to develop a customised solution for the red meat industry to cater for the specific requirements. It is proposed to use cutting edge open-source applications as its foundation to tailor an automated solution which will have several benefits.

The benefits of a red meat centric solution would be firstly faster, fresher flows through accuracy improvement of store orders which in turn provide certainty in inventory and risk period reduction. The risk period reduction will result in at least 1 day being removed out of the red meat order cycle, which will result in a significant reduction in markdown waste due to this order accuracy and subsequent delivery improvements with associated weekly cost savings.

Furthermore the solution will release latent capacity through ordering efficiencies of pallet and layer rounding which is projected to improve outbound capacity by 17%. The rounding of pallets will improve robotic palletisation performance, as well as allow multiple stacking of part pallets onto trucks to maximise transport utilisation.

This outbound capacity improvement will result in an enabling the total volume of red meat handled at Erskine Park to increase from 550T/week to 700 T/week. Improved ordering efficiency and better scheduling of orders will also allow transport optimisation, which in turn will reduce greenhouse gases.

The overall solution will be comprised of multiple open-source applications. This approach provides cost benefit advantages over a proprietary custom solution, with the ability to be leveraged by the entire red meat industry in the future. The overall software solution will result in conglomerating these open-source solutions to one application called Tillit. (Customisable specifically for fresh meat requirements).

Compatibility of systems across the industry can be achieved through the adoption of this process by the broader red meat industry especially around open-source methodologies. This project will act as a roadmap for the red meat industry to follow, in order to achieve the same benefits for their businesses.

The first state solution, accounting for business objectives for delivering a consistent platform across Retail Ready Meat processors (Coles Network) and addressing any solution gaps to the FFF Business Requirements Document, to deliver a fully automated solution. Implementation by June 2022.

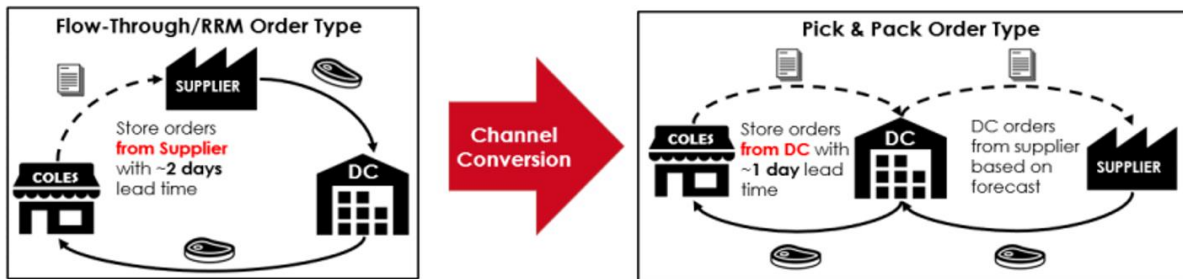
The final phase will focus on an increase in Inbound storage capacity to further facilitate the production uplift from 1150 T to over 1300 T of meat output per week. The new system will be used to integrate with external storage providers for order management and raw material information exchange which will increase inbound capacity by 50%. Implementation by July 2023.

### Objectives

- Development of a license free, open-source application tailored for red meat order management utilising Nukon’s TilliT application suite powered by such applications as Camunda, Grafana, InfluxDB and AWS



- Reduction of 1 day out of the order cycle between customer order, to production execution, to delivery to store from the distribution centre



- Integration between the customer and multiple secondary processing suppliers for store orders to production execution, pick order optimisation, truck load optimisation, and coordination between processors and stores in order to select the best processor based on criteria such as price, packaging format, shelf-life, machine availability etc.
- Data Integration with 3<sup>rd</sup> party storage providers to increase InBound capacity

The above objectives have been achieved for a limited number of SKUs at Coles Retail Ready Operations Australia (RROA) as of May 2023. These objectives are now being fully implemented at RROA across the full range of SKUs, and with the Coles contract suppliers through the May to July period.

### Methodology

Design of the Faster Fresher Flow channels utilising a license free, open-source suite of applications.

Phase 1 – Pick and Pack Integration

Phase 2 – Automated order, inventory and transport optimisation management system

Phase 3 – Inbound capacity increase with associated data integration with 3<sup>rd</sup> party providers

## Results/key findings

Due to the **complexities of the meat supply chain**, with varying weights, varying prices per customer per store, multiple packaging formats with shorter or longer shelf-life and multiple suppliers to select from to fulfill customer orders, **a more holistic and integrated approach was required** to optimise the order to production to delivery process flow, in the supply chain. This meant, in order to achieve the highest level of optimisation, RROA, the Coles DCs and other associated **suppliers**, all needed to be **integrated via the same application stack**. However the benefit of **1 day out of the order cycle** for RROA was achievable without the other suppliers being integrated. Having the other suppliers integrated allowed for the customer, via DCs, to have **more options** to fulfill orders in a way that minimised the order cycle and cost, while maximising shelf-life, **in the face of any particular supplier issue**.

The **customer can utilise information on the supplier sites, equipment, lines and people, by products and packaging format, accounting for shelf life constraints, in order to optimise the supply chain to leverage opportunities and bypass issues**. Information transparency provided to the customer allows the orders to be balanced across the week in order to do such things as produce short shelf-life product or packaging formats, on the highest volume consumption days and optimise across suppliers. The information across suppliers and within the supplier production profiles, informs the business which packaging formats to increase, to **ensure multiple packaging formats are available for the various demand scenarios**. The FFF channels allow site capabilities to be shared with the customer, to allow the customer to **make appropriate orders across time which will optimise the supply chain to deliver the freshest product with the longest shelf life, utilising the transport channels in the most efficient manner**.

## Benefits to industry

This Faster Fresher Flows initiative showed that the strategy of employing license free, open-source development applications, was a very cost-effective way of developing a tailored red meat application stack that integrates store orders to secondary processors, production execution and pick order optimisation at the processor, truck load optimisation, and coordination between processors and stores in order to select the best processor based on criteria such as price, packaging format, shelf life, machine availability etc.

Any other proprietary suppliers can leverage this approach to achieve faster, fresher, flows. Timeframe will be post RROA development.

Other parts of the business have benefited from the solution such as Chef Fresh and non-Red Meat sectors.

## Future research and recommendations

Leveraging the license free, open-source suite of applications tailored for the red meat industry, other Coles suppliers can now be integrated to provide the business with further optimisations across their supply chain.

The wider red meat industry can implement the same strategies and methodologies, to achieve similar optimisations across their supply chains.

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# 1 Milestone Description

## 2 Milestone 1

Faster Fresher Flows in Red Meat Food Processing Milestone 1 Report.

Submit commercial and in confidence report to the MLA along with a public report, for review and approval which should include recommendations for Milestone 2, third party review of findings, impacts and outcomes from the program. Lessons learnt on innovation approaches, growth opportunities, successes, failures and surprises to be included in the public report for industry release.

In Milestone 1, Coles RROA has designed and deployed the following modules within TilliT – Release 1:

- Pick and Pack Integration/FFF Channel Optimisation.
  - DC Order receipt.
  - DC Order Plan.
  - Roster calculation.
  - Import Order Plan.
- Demand Aggregation.
  - Order management / integration
- Alert management.
- Archiving.
- Open-source solution hardening.
- Data creation for optimisation and advanced analytics

## 3 Milestone 2

Milestone 2 report presented Phase 2 of development, specifically:

- Pick and Pack Integration/FFF Channel Optimisation.
  - Testing.
  - Deployment.
  - Implementation OPEX.
- Sustainability.
- Open-source solution hardening.
- Data creation for optimisation and advanced analytics.
- Resultant Truck Optimisation
- 17% Pick Efficiency Interstate
- Zero touch ordering with no interventions required from WM6
- Crating off reductions
- Volume uplifts

## 4 Milestone 3

Milestone 3, specifically:

- Management of Red Meat primals in an external storage provider so content better reflects automated order management (RAND Integration)

## 5 Milestone 4

Milestone 4 continued the development of Phase 2 TilliT development to support the Red Meat Production Planning & Scheduling modules. User interface for data creation, order optimisation, live schedule, parameter configuration and advanced analytics.

Some specifics achieved/experienced in this milestone were:

- Unlock capacity to enable future plant growth
- Improve freshness of red meat
- Transition plan to roll out faster fresher flows initiative for warehouse order optimisation and improved store order lead times starting with Coles, then rolling out to the other Red Meat contract manufacturers (Note: RROA is the only site with multi-channel capacity to de-risk the network transition and give contingency.)
- Flexibility in order rosters enabling holiday benefits
- ASO progress and update
- Continued benefits from pallet rounding increasing truck utilisation
- Live Schedule developed in-house by Digital Officer
- Improved visibility of production schedule against the picking schedule, enabling to the minute live alignment
- Capability for picking parameters: changes to price, shorting product and Minimum Life on Receipt (MLOR) concessions by the production planner
- Lower inventory through better alignment of pick to production
- Faster pick rate and improved availability due to less administration
- Drop in finished goods holdings
- Challenges in the RAND integration (Milestone 3)
  - Design complexity
  - SME departure and project team consistency
  - Integration and multiple solution partners

## 6 Milestone 5

Milestone 5 continued the development of Phase 2 TilliT development to support the Red Meat Production Planning & Scheduling modules. User interface for data creation, order optimisation, live schedule, parameter configuration and advanced analytics.

Some specifics achieved/experienced in this milestone were:

- 10-20 point pick rate improvement in DC grid productivity
- Better pallet builds saw improvement in safety and reduced damages
- Better for stores, higher supply accuracy
- 1 day store order lead time removed from every SKU ordered (grid)
- Better for suppliers, enabling flexible order plans and COGS
- Improving freshness by removing supply chain dwell time
- Improving availability by giving more control and supply levers to the BU's
- Estimating large annualised savings on WMD
- Major change in RRM space in the last 10 years
- Unlock capacity to enable future plant growth
- Transition plan to roll out faster fresher flows initiative for warehouse order optimisation and improved store order lead times starting with Coles, then rolling out to the other Red Meat contract manufacturers (Note: RROA is the only site with multi-channel capacity to de-risk the network transition and give contingency.)
- Flexibility in order rosters enabling holiday benefits
- ASO progress and update
- Continued benefits from pallet rounding increasing truck utilisation
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- Improved visibility of production schedule against the picking schedule, enabling to the minute live alignment
- Capability for picking parameters: changes to price, shorting product and Minimum Life on Receipt (MLOR) concessions by the production planner
- Lower inventory through better alignment of pick to production
- Faster pick rate and improved availability due to less administration
- Drop in finished goods holdings

## 7 Milestone 6

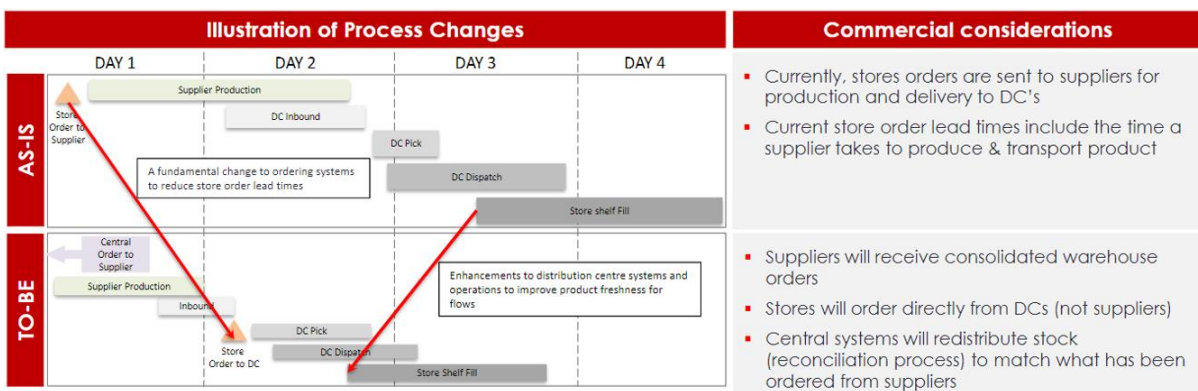
Milestone 6 continued the development of Phase 3:

- Red Meat 3PL Integration.
- Traceability.
- Red Meat Inbound transport and freshness optimisation.
- RROA Red Meat Capacity Growth.

## 8 Background

## 9 Project purpose & scope

The Faster Fresher Flows (FFF) initiative, will deliver a minimum of one day of additional life to customers by optimising stock flow, through system and process improvements across the fresh supply chain.



### Faster Fresher Flows Deliverables

- One day reduction to store order lead times by converting to Pick & Pack order types
- The current fresh supply channel can not maximise freshness and availability due to fundamental limitations in current ordering systems. This solution unlocks the full benefits of easy ordering.
- Improving freshness for customers by changing supply chain Day In the Life Of (DILO).
- RROA and the Meat BU aim to operationalise a tactical solution to enable the transition of “Flowthrough” products to the Faster Fresher Flow process by October 2022. This change will enable the DC Ordering Logic for approximately 30% of RROA’s volume, enabling pallet/layer rounding (level and complete layers) and an estimated 8% throughput improvement for outbound (on the interim state) 17% target for the end state. This will be a critical enabler in delivering future growth for the site.
- Accuracy improvement of store orders by improving certainty in inventory and risk period by one day
- System capabilities to shape demand between suppliers using the POSST system
- Fully automated solution for Faster Fresher Flows in the Coles Network
- Production uplift of over 150T/week increase in red meat capacity
- Transport optimisation with subsequent greenhouse gas reductions

## 10 Outcomes

The value proposition for the Australian Red Meat Industry of enhancing the order management process is likely to be:

- i) An open-source suite of applications as the foundation for a red meat centric product which can be utilised by the entire red meat industry
- ii) Improve store order accuracy through better inventory management thereby reducing the red meat order cycle by 1 day
- iii) Reduced markdown waste at store level by 10%
- iv) Release latent outbound capacity by 17%
- v) Optimise pallet and layer efficiencies
- vi) Reduce transportation costs
- vii) Reduce transport related green-house emissions
- viii) Increase inbound capacity to facilitate a red meat production uplift from 1150T/week to over 1300 T/week

The following are baseline measurables and targets of the project.

### **Waste and Markdown**

**Baseline:** <3%% waste and markdowns of total sales for red meat

**Target:** Reduce waste and markdown levels by 15%

Waste and Markdown account for <3% of total sales for red meat which Represents a high per annum cost and associated customer dissatisfaction. Markdowns occur when a limited shelf life remains on meat packs and the stores are forced to discount the meat, donate it to charities or in a worst case scenario if past use by, they may be dumped. Long distance stores have further challenges as life is lost during transport.

The proposed development of a new integrated supply chain software and order enhancement process changes within Coles/RROA, will work to take at least a day out of the Supply Chain which is expected to reduce the waste and markdown levels by at least 15%.

### **Capacity Improvement – Buffer Chiller**

**Baseline:** 5hrs - Buffer Chiller Breach Delays

**Target:** 0hrs – Buffer Chiller Delays

Currently the Coles/RROA site is constrained by the limited space in the automated warehouse. The result experienced is regular breach of buffer chiller capacity and production interruptions with the need for Operations to buffer crates prior to the buffer and re-introduce them into the Warehouse system when the buffer capacity is available.

### **Capacity Improvement**

**Baseline:** 550 T/week red meat production

**Target:** >700 T/week red meat production

### **Labour Cost**

**Baseline:** 50 personnel to double handle crates of meat for 5hrs/week

**Target:** Elimination of crate off

Buffer capacity breaches not only cause delays to production but require personnel to crate off and on crates.

The new TilliT programming will address this bottleneck through live predictive modelling of orders/production output/ auto pick sequencing, allowing the automated warehouse and robotic system to commence picking multiple orders and channels at predefined points instead of waiting for the full quantity of products to become available, thereby reducing the total crates in the buffer at peak times and eliminating crating off.

### **Transport**

**Baseline:** 85% truck volume utilisation

**Target:** 95% truck volume utilisation, with associated transport cost saving

Currently some store orders result in uneven pallet configurations resulting in under-utilised transport. Pallets with incomplete layers of swing bar crates cannot be double stacked and result in the under-utilised trailers.

This is particularly expensive for interstate transport, which accounts for 50% of the total volume produced at RROA Erskine Park. Typically trucks are around 85% utilised due to uneven palletisation.

The order enhancement section of the upgrade will ensure that orders are rounded off to a full layer to maximise truck utilisation to an estimated 95%.

A 10% improvement in truck utilisation of interstate transport will result in a saving equivalent to 2B doubles per week, which represents significant transport cost savings.

### **Greenhouse Emissions**

**Baseline:** 28 B-Double Interstate trips/week = 1,330T/year CO<sub>2</sub>

**Target:** 2 B-Double reduction/week = 95T/year CO<sub>2</sub> reduction = 481 trees

## 11 Success in meeting the Milestone

### 12 Milestone 1

Milestone 1 has been successfully achieved through the development and deployment of TilliT Release 1 which has delivered a 1 day reduction in the order cycle for several red meat SKUs, improved transport utilisations by 15%, achieved outbound optimisations and enabled rapid rollout to Red Meat Distribution partners leveraging the TilliT design foundation for a fraction of the expected cost.

The following sections will detail the development and deployment of TilliT Release 1 and the outcomes delivered for the Faster, Fresher, Flows initiative.

### 13 Development of TilliT Release 1

RROA's system for pick and pack order management was previously managed by an Access Database and excel spreadsheets. This represented a very manual, labour intensive and restrictive system. The move to an open-source application foundation has resulted in a platform which utilises a modern but license-free database, with tailored algorithms that have optimised the order execution process to deliver shorter cycle picks and packs along with many other optimisations and efficiencies.

### 14 *Design Scope*

The development of the TilliT Release 1 application was comprised of the following application features.

- Pick and Pack Integration/FFF Channel Optimisation.
  - DC Order receipt.
  - DC Order Plan.
  - Roster calculation.
  - Import Order Plan.
- Demand Aggregation.
  - Order management / integration
- Alert management.
- Archiving.
- Open-source solution hardening.
- Data creation for optimisation and advanced analytics

The RROA Digital Officer and Production Planning team developed the application design specification for TilliT Release 1 to achieve the Faster, Fresher, Flow initiative's outcomes, and provided these to our technology execution partner, Nukon and Coles IT.

**Appendix 3** details the design development process including assumptions, decisions, application features and their target outcomes.



## 15 Agile Software Development

Using the Atlassian software tool, **JIRA**, the RROA and Nukon teams were able to manage the software development of TilliT. ***Managing sprints and tracking and resolving bugs through raised tickets.***

### **Main Sprints**

- TP2 - Production Planning #1
- TP2 - Production Planning #2
- TP2 - Production Planning #3

There were several pre and post-production iterations in each sprint and several hundred tickets raised through the process.

See **Appendix 4** for a sample of the following tickets within the sprints:

- **TP2 - Production Planning #2** – Production Schedule Sequence Field
- **TP2 - Production Planning #1** – Resource Group SubTotal
- **TP2 - Production Planning #2**-Duplicates in Notes column for Specials
- **TP2 - Production Planning #2, Post Production Iteration 11**-Maintenance job creation for future dates
- **TP2 - Production Planning #3**-Innova Order Status Production Quantity column
- **TP2 - Production Planning #1**-Default change-over time added per item in a production line
- **TP2 - Production Planning #2**-3 different schedule printout templates for 3 main user types
- **TP2 - Production Planning #1**-View Innova Production Schedule button
- **Post Production Iteration 9, TP2 - Production Planning #1, Post Production Iteration 10, Post Production Iteration 8**-Number of pieces per tray adjustment by Planning Users
- **Post Production Iteration 2, Post Production Iteration 9, TP2 - Production Planning #3, Post Production Iteration 10, Post Production Iteration 1, Post Production Iteration 8**-NSW bulk order priority dispatch with configurable time
- **Post Production Iteration 2, TP2 - Production Planning #1, Post Production Iteration 1**-Default change-over time
- **TP2 - Production Planning #3** – Develop a table to maintain expected finish time for each priority
- **TP2 - Production Planning #3** – Key figure added in planning view showing what has been scheduled to be produced
- **Post Production Iteration 9, TP2 - Production Planning #3, Post Production Iteration 10, Post Production Iteration 8** – Display Raw primal count in Jasper report and Production Schedule
- **TP2 - Production Planning #3** – New UI button to recreate a schedule with no overrides

## 16 Deployment of TilliT Release 1

The deployment of TilliT Release 1 was a very smooth process with only one noteworthy challenge.

The initial DC Purchase Order testing contained a limited number of SKUs which contained a conversion calculation for the Unit of Measure (UOM) field. When the release was rolled out there was no test case to check the UOM conversion. As new SKUs were rolled out there was a discrepancy in the conversion calculation. This issue was actually a pre-existing bug in the business to business integration between Suppliers and Coles which was identified during the deployment. The conversion was quickly resolved by the developer and no remaining issues were encountered in the rollout.

### 17 *Deployment SKU List*

The current list of red meat SKUs that have been included in TilliT Release 1 are show below. Additional SKUs will be added over the next TilliT releases and reported in future milestones.

ITEM CODE	ITEM DESCRIPTION
1832188	COLES BEEF SIZZLE STEAK 400GRAM:400 GRAM
2024280	COLES GRAZE GRASS FED BEEF MINCE 500G:500 GRAM
3167294	DROVERS CHOICE BEEF EYE FILLET PIECE:PER KG
3449773	COLES BEEF 4 STAR LEAN MINCE RR 9X7 :800 GRAM
3537575	COLES VSP RR 11X9 BEEF T BONE STEAK:PER KG
3829606	DROVERS CHOICE NO ADDED HORMONE BEEF T-BONE END CUTS:PER KG
7442878	COLES BRAND RR 11X5 BEEF PORTERHOUSE STEAK:PER KG
8599150	COLES BRAND RR 11X9 BEEF CHUCK CASSEROLE STEAK:PER KG
8599332	COLES BRAND RR 11X5 BEEF GRAVY BEEF:PER KG
8601616	COLES BRAND RR 11X9 BEEF T BONE STEAK:PER KG
8601707	COLES BRAND RR 11X 9 BEEF RUMP STEAK:PER KG
8850188	COLES BEEF 3 STAR REGULAR MINCE RR 9x7 :500 GRAM
8850450	COLES BEEF 4 STAR LEAN MINCE RR 9x7 :500 GRAM
8850654	COLES BEEF 5 STAR EXTRA TRIM MINCE RR 9x7 :500 GRAM
8850814	COLES BEEF 3 STAR REGULAR MINCE RR 9x7 :1 KG
8905916	COLES BRAND RR11X5 BEEF SCOTCH STEAK:PER KG
8905993	COLES BRAND RR 11X 5 BEEF RUMP STEAK:PER KG
3305070	RR COLES (7X5) LAMB CUTLETS:PER KG
6546890	RR YL COLES BULK (11X9) LAMB CUTLETS:PER KG
8598420	RR COLES BUTCHER (11X5) LAMB LOIN CHOPS:PER KG
8598985	RR COLES BUTCHER (11X9) LAMB LOIN CHOPS:PER KG
8599161	RR COLES BUTCHER (11X9) LAMB MEAT BONES RRM:PER KG
8599208	RR COLES BUTCHER (11X9) LAMB FOREQUARTER CHOPS:PER KG
8599241	RR COLES BUTCHER (11x5) LAMB FOREQUARTER CHOPS:PER KG
8850053	COLES BRAND RR 9X7 LAMB MINCE:500 GRAM
8940189	RR COLES BUTCHER (7X5) LAMB CUTLETS EXTRA TRIM:PER KG
3534840	COLES VSP 11X 9 BEEF RUMP STEAK:PER KG
3537655	COLES VSP 11X9 BEEF CHUCK CASSEROLE STEAK:PER KG
3537757	COLES VSP RR 11X9 BEEF GRAVY BEEF:PER KG
3293379	COLES NO ADDED HORMONE BEEF SANDWICH STEAK 400GRAM:400 GRAM

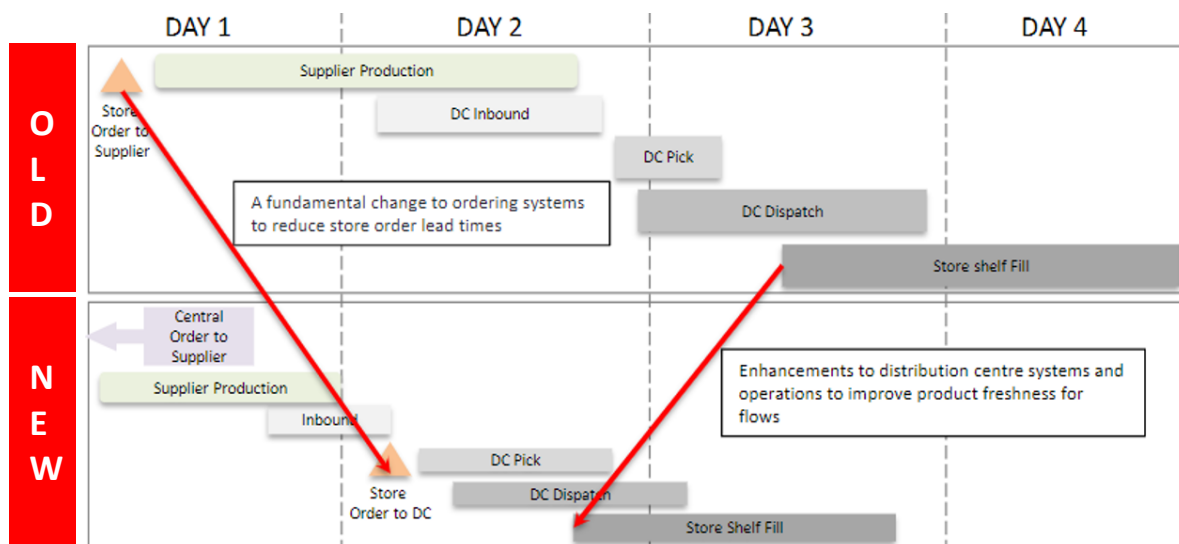
## 18 Faster, Fresher, Flows Outcomes from TilliT Release 1

Faster Fresher Flows is a Coles driven initiative of which RROA is the first to deliver on the vision. The goal is for short execution cycles with a dramatically reduced cost basis. TilliT Release 1 is an intrinsic part of the overall system being used to deliver on these goals.

### Faster Fresher Flows Deliverables

- One day reduction to store order lead times
- Improving freshness for customers by switching to supply chain DIL0
- Easy ordering

**TilliT Release 1**, which manages the supplier Production Schedule to Orders process, in conjunction with the Replenishment Management System (**RMS**) and Business to Business (**B2B**) integration between suppliers and DCs has been able to **reduce the store order lead times by 1 day** out of the end to end supply chain.



### Old Order Cycle Process

- Previously, store orders were sent to suppliers for production and delivery to DCs
- Store order lead times include the supplier production and transportation time

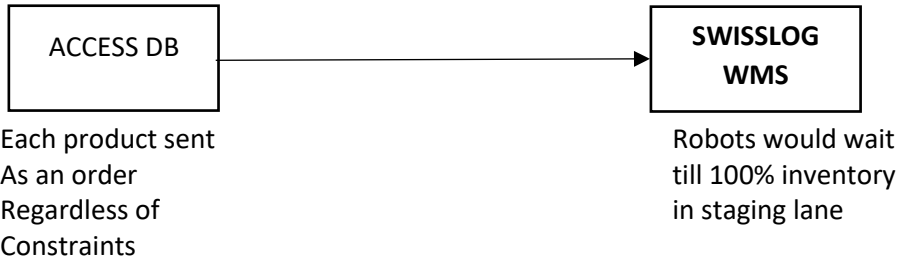
### New Order Cycle Process

- Suppliers now receive consolidated warehouse orders
- Stores order directly from the DCs not Suppliers
- Central systems redistribute stock (reconciliation process) to match what has been ordered from suppliers

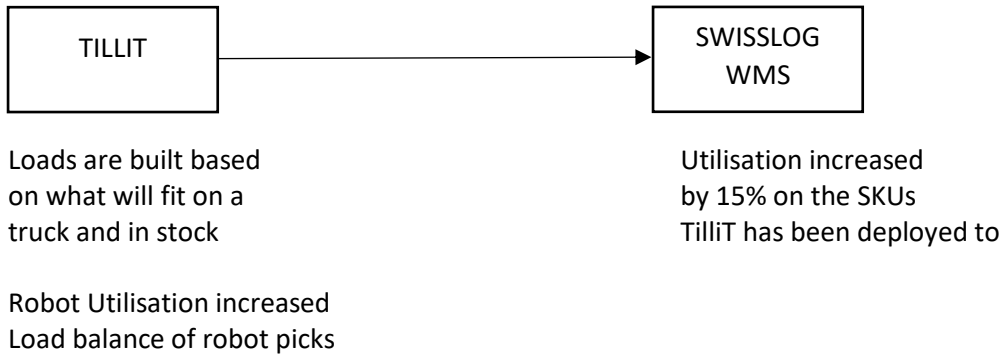
## Outbound Pick and Place Optimisations

TilliT Release 1 has enabled the ability to predict what orders are coming through to the Buffer Chiller in order to automatically schedule the picks and continuously build the pallet loads, rather than waiting for the entire order to be completed before building the pallet load. Additionally the loads are built in a way that optimises the truck load that has increased utilisation by 15%

### BEFORE



### AFTER TILLIT RELEASE 1



## Truck Utilisation Uplifts

Prior to the TilliT algorithms, pallet loads could contain incomplete layers. This would not allow for double stacking pallets. If layers were somewhat complete, pallets may be able to be double stacked, but they would not be very stable. Unstable loads would require holding bars at 1.2m and 2.4m high to be installed by the outbound team. This represents an increased time to load and head count.

Through the use of the TilliT pick and place algorithms, complete layer loads are placed on most pallets. This allows for double stacking pallets which are completely stable, which allows for the removal of the holding bars.

The result of the optimised pallet loads is a 15% uplift in truck utilisation moving from an average of 42 crates/pallet to 48 crates/pallet. This has resulted in a reduction in 51 B-Double transport movements which is a 46.5T reduction in greenhouse gases ie a saving of 235 trees per year. This is just based on the minimal rollout achieved in this first phase release. Further benefits will be realised

Trials have so far been successful and have resulted in time savings of approximately 30% for both loading at RROA and unloading at the DC. If applied to all loads, this method could potentially save on logistic costs by labour reduction. RROA has commissioned a logistics engineering consultant to assess the risks and ensure safety of this transport loading method.

**Poor utilisation of truck loads**



**Improved utilisation of truck loads – 15% improvement**

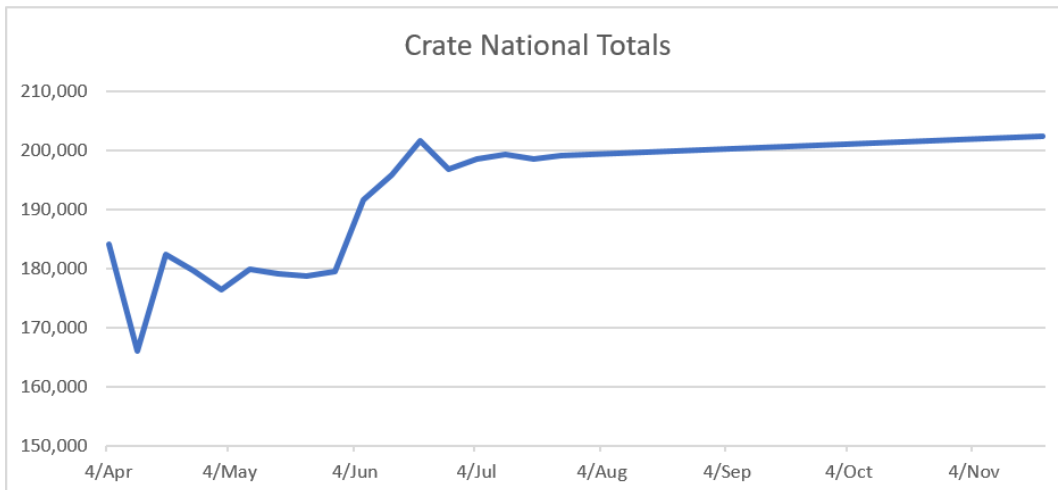


**Stabilisation Bar Removal – 30% Time at RROA & DC and Head Count savings**



**National Crate Output Forecast Uplift**

The significant transport utilisation and outbound optimisation increases delivered by just this first release of TilliT, has allowed RROA’s national crate delivery forecast to be increased by 12% starting from June 6, 2022. Further uplifts are expected from future releases of TilliT being developed which will be reported in upcoming milestones.



Current Average Crate Output	178,410	Crates
Forecast Average Crate Output	199,872	Crates
Forecast Increase in Crate Output	21,462	Crates
Forecast Increase in Crate Output	12%	Percentage Uplift

## Benefits Realised by Red Meat Distribution Partners

Coles Red Meat Distribution partners were initially planning a 3 month scoping phase to design their own system to achieve a business to business integration with RROA to beachieve the FFF channel. The RROA team proposed a plan to deliver these outcomes instead of Coles IT, by leveraging the implementation of TilliT Release 1. DO on site understanding fast-tracked RMS, B2B, TilliT ultimate solution at a fraction of the cost.

The RROA team were able to use their TilliT application, fully tailored for the warehouse requirements and **deploy a working system in only 2 months**. The fully deployed implementation was delivered at a cost of only **45% of the budget reported by our partner's** which was only going to cover the scoping of their design, let alone a full implementation.

This is an incredible outcome in both time and cost to deploy, showing the **cost-effectiveness** of an open-source application and **simplicity** to implement.

Processing partners are also looking at leveraging the design of TilliT to achieve their own FFF benefits.

## 19 Milestone 2

Milestone 2 has been successfully achieved through the development of TilliT Release 1 – Production Planner, Adjusted Store Order module.

Previously, orders were based on a static pick grid at the distribution centres, which introduced inefficiencies. In order to support the faster, fresher flows initiative and remove at least 1 day out of the order cycles, this grid picking has moved to a dynamic allocation model.

In order to support the dynamic grid allocation at the DCs, RRM has developed a new module within TilliT, called the Adjusted Store Order (ASO) module, which pushes all orders from RRM, whether despatched or about to be despatched, early each day. Previously Coles would pull these orders from RRM, but they would only be the orders which were despatched. These orders may not be finalised from RRM until as late as 12:30pm which is not sufficient for the dynamic grid allocation. Now the orders are being pushed to the DCs via the ASO module early each day, allowing the dynamic allocation to be supported.

The following sections detail the development of the design for the TilliT Release 1 – Production Planner, Adjusted Store Order module and its final deployment for the red meat sites and associated DCs.

## 20 Development of TilliT Release 1 Production Planner, Adjusted Store Order

### 21 Context & Problem

Automated slotting functionality was introduced into Retail Ready Meat DCs in 2019.

Most meat is picked from 'the grid', a specific area of each CDC. The grids operate on a 'pick to zero' model.

- First, receiving is completed and received pallets are put away to their specified locations in the grid.

- Once all receiving & put away has completed, picking commences. All stock delivered is picked within 24 hours.
- Once picking is completed and the grid is 'cleared', the cycle repeats starting with receiving again.

Currently DCs operate a 'static' layout in the grid. Each item has a specific location (or multiple locations), and these change only rarely.

Volumes for each SKU fluctuate each day e.g. there could be 10 pallets of a specific SKU on Friday, but only 3 pallets on Monday. As a result, a static layout introduces inefficiency to DC operations. If a SKU has too many pick slots, the pick path is longer than required causing increased travel distance for pickers. If a SKU has too few pick slots, more pallets have to be put away to a reserve location and replenished during the pick, causing direct labour cost and an increase in pick congestion.

Due to this inefficiency, DC grids are converting to a dynamically slotted layout. DCs will use a newly-developed tool to dynamically slot the grid early in the morning each day before put away commences. The new tool looks at inbound PO volume (FXO and FFF) or store order volume (RRM) to determine how many pick slots to allocate to each item.

Dynamic slotting must see the full expected volume for the day to design an optimised layout, and DCs must run the tool early in the morning to allow put away to start (preventing receiving lane congestion).

RROA RRM store orders are only sent to DC after despatch from RROA – final despatch for the day can be as late as 12:30pm. This introduces a clash with the new dynamic slotting process that must be resolved - with the current system setup, dynamic slotting will only see what RROA has already despatched (not what RROA has yet to despatch).

## 22 *Proposed Solution*

- **Scope:** RRM ASOs sent from RROA to Eastern Creek. No change to Parkinson, Laverton, Edinburgh Parks. No change to FXO.
- No change to existing 2-hourly ASO batch of despatched orders.
- **Change:** Creation of a new job at a specified time daily (e.g. 4:30am) to send ASO file to Eastern Creek containing all RRM store orders with DC delivery date of current day (in both despatched and not despatched statuses).

## 23 *Example Scenarios*

### 1. **No item despatched before 4:30am; all volume despatched later in the day (e.g. 7am)**

- *5 cartons of store orders for SKU 123 to store 853*
- *New ASO batch at 4:30 contains this quantity as both despatched and undespatched ASO qty are sent in this file*
- *ASO file generated at 5:30am does not contain item 123 for store 853 as it has not yet been despatched. Note item will be completely missing from the store distro (not a null or 0 qty)*
- *Store distro 33817941 will still be sent at 5:30am containing any items that have been despatched*



- ASO file generated at 7:30am contains 5 cartons for 853 as item has now been despatched from RROA

RROA Batch	Store Distro Number	Store	SKU	Despatched Quantity	Undespatched Quantity	Item in ASO?	ASO Quantity
3:30am	33817941	853	123	0	5	N	
4:30am	33817941	853	123	0	5	Y	5
5:30am	33817941	853	123	0	5	N	
7:30am	33817941	853	123	5	0	Y	5

**2. Partial quantity of item has been despatched by 4:30am; remaining volume despatched later (e.g. 7am)**

Full store order qty for 853 is 5. This is reflected in 4:30am ASO batch.

3 cartons has been despatched by the time of the 5:30am ASO batch. ASO file contains 3 cartons (less than original 5). Remaining 2 carts is despatched before 7:30am.

RROA Batch	Store Distro Number	Store	SKU	Despatched Quantity	Undespatched Quantity	Item on ASO?	ASO Quantity
3:30am	33817941	853	123	0	5		
4:30am	33817941	853	123	3	2	Y	5
5:30am	33817941	853	123	3	2	Y	3
7:30am	33817941	853	123	5	0	Y	5

**3. Partially supplied item**

Full store order qty for 853 is 5. This is reflected in 4:30am ASO batch.

3 cartons has been despatched by the time of the 5:30am ASO batch. ASO file contains the 3 cartons supplied. WMS updates store distro to 3 cartons.

RROA Batch	Store Distro Number	Store	SKU	Despatched Quantity	Undespatched Quantity	Item on ASO?	ASO Quantity
3:30am	33817941	853	123	0	5		
4:30am	33817941	853	123	3	2	Y	5
5:30am	33817941	853	123	3	2	Y	3
7:30am	33817941	853	123	3	2	Y	3

**4. Full volume despatched before 4:30am**

RROA Batch	Store Distro Number	Store	SKU	Despatched Quantity	Undespatched Quantity	Item on ASO?	ASO Quantity
3:30am	33817941	853	123	0	5	N	
4:30am	33817941	853	123	5	0	Y	5
5:30am	33817941	853	123	5	0	Y	5
7:30am	33817941	853	123	5	0	Y	5

**5. Store order qty adjusted up at 5am, stock despatched at 7am.**

RROA has the capability to adjust store orders above the originally ordered quantity. If adjusted up after 4:30am the higher quantity would not be visible in the 4:30am ASO file.

*Additional volume would still be present in normal ASO files after despatch (as per current functionality)*

*Dynamic slotting would not consider the additional volume when slotting. Given the rarity of this situation and low impact to overall volume, this is not a problem.*

RROA Batch	Store Distro Number	Store	SKU	Despatched Quantity	Undespatched Quantity	Item on ASO?	ASO Quantity
3:30am	33817941	853	123	0	5	N	
<b>4:30am</b>	33817941	853	123	0	5	Y	5
5:30am	33817941	853	123	0	10	N	
7:30am	33817941	853	123	10	0	Y	10

### 6. Manual store order created at 5am and despatched at 7am

*Rarely, manual store orders are created at RROA on request from the BU. If created after 4:30am these would not be present in the 4:30am ASO file.*

*They would still be present in normal ASO files after despatch (as per current functionality)*

*Dynamic slotting would not consider this volume when slotting. Given the rarity of this situation and low impact to overall volume, this is not a problem.*

RROA Batch	Store Distro Number	Store	SKU	Despatched Quantity	Undespatched Quantity	Item on ASO?	ASO Quantity
3:30am							
<b>4:30am</b>							
5:30am	91234567	853	123	0	10	N	
7:30am	91234567	853	123	10	0	Y	10

These Retail Ready Meat DCs do not receive store order details from the host system but rely on an “Adjusted Store Order (ASO)” message from each Retail Ready Meat (RRM) facility. This ASO message is generated at the time of pick which leads to an incomplete file when the automated slotting functionality is executed.

The request of RROA is to generate systematic changes to enable the sending of the ASO file ahead of the picking of a completed order.

### 24 Requirements & Assumptions

1. Procedures called by Control M can work within the existing schedule
2. Orders will only be generated for the day of delivery
3. The fairshare unders process will not be required
4. The ASO file will only be generated under the following conditions
  - there is no existing ASO message previously sent
  - there has been an update since previous transmission (previously, file was sent regardless of if updated – if no update there will be no file at all – not an empty file)
  - there has been a change to the store order records in the source system (Tillit) – this can be a system generated or manual order
  - no fair share under will be calculated in the ASO message based on actual picks
  - Any updates, manual orders or new system orders will be sent with new orders appended to file with preserved sequence
5. Existing Alerts and monitoring for any schedule failures will be preserved

## 25 Development Principles

- Solution can be decommissioned in the event that this process is no longer required by the DCs
- The legacy solution ReadyPlanner can be decommissioned without impact to the new process
- The solution retains existing methods of data capture of latest file results and historical messages
- SysTest will include scenarios (BBDs) provided by the business as well as validation of file formats
- Implementation plan will include simulation and monitoring of jobs

Development will be the lowest cost option meeting all other objectives.

## 26 Process

### Control M Schedule (As Is)

9375 – every 2 hours

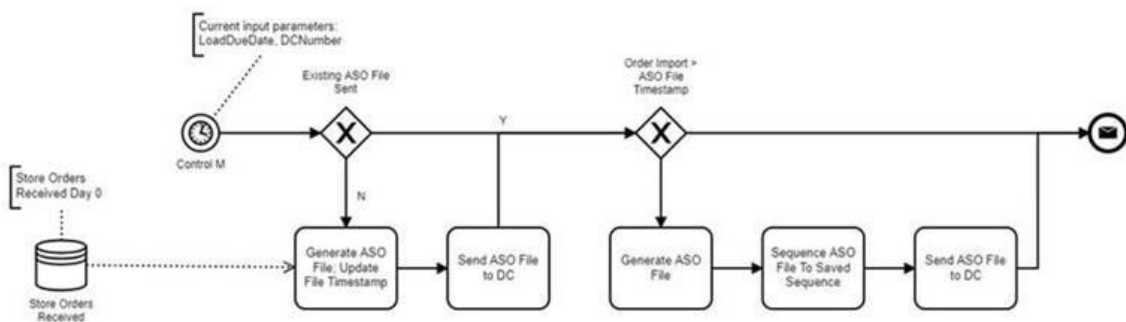
9553 – every 2 hours

9270 – every 2 hours from 1:30 to 14:00

9453 – once at 5:00

Note that future schedule changes can be made upon business request to fit with timing requirements; past constraints caused by duplication of files will be removed.

### To Be Process Flow



### Implementation Notes

Create new path in p\_sync\_data job which triggers a bpm process. This BPM process triggers the generation of the XML file from the results of a stored procedure.

Each ASO XML generation is to be stored to the database to ensure we have backup record of what was generated, how much was changed and when. This will also allow us to check the changes in the ASO file as new store orders come in, allowing for greater visibility and possible re-generation of the XML ASO file.

In the occurrence that there is an error in the XML generation process at the scheduled time, a manual generation of the XML should be available to generate a file at any time.

Included in the generation of the XML should also include useful error messaging, ideally in the form of email alerts out of the TilliT system.

As the ASO process will only be considering the Store orders as they arrive there is no need to consider order\_plan data or wm6 pick data. This allows the new process to be triggered from SSIS just after the store\_orders have been imported based on a pre-defined schedule.

Manual orders with a storeOrderNumber of 'Waiting' will not be considered when generating the XML file.

### **Order of Magnitude (Sizing of Effort)**

#### **New objects to be created:**

- ❖ New configuration data:
  - New record in the System\_configuration table to store path of output file to IN folder
  
- ❖ New tables: 1 day
  - **store\_order\_adjustment**
    - Contains store orders with orderid values generated from current Load\_due\_Date (the last ASO File Generated)
  - **store\_order\_adjustment\_schedule**
    - Contains Schedule of xml generation on a shipping\_location level.
      - ◆ DC
      - ◆ Active
      - ◆ Start time e.g. 5am
      - ◆ End time e.g. 1:30pm
      - ◆ Run type e.g. Run once or on schedule
      - ◆ Schedule period hrs e.g. 2 hours
  - **store\_order\_adjustment\_xml\_log**
    - Contains all generated xml along with statics of changes, records inserted, updated, error log
  
- ❖ New procedures: 3 days
  - **usp\_generate\_store\_order\_adjustment**
    - Looks at the store\_orders and populates the store\_order\_adjustment table with correct sequence of store\_orders. Will populate new records when more store\_orders have been created or imported. Will update existing records with quantity if it changes from the store\_orders table. Output of this stored\_procedure also reports number of orders created, updated and error messages surrounding the generation of the records. Also returns a severity level.
  - **usp\_generate\_store\_order\_adjustment\_xml**

- looks at the store\_order\_adjustment to generate the xml for ASO file. Returns the XML along with additional information passed back from the usp\_generate\_store\_order\_adjustment procedure surrounding the number of records created, updated and any errors.
  
- ❖ New BPM process: 1 days
  - **AdjustedStoreOrderProcess**
    - Based on passed in parameters from the (Shipping\_location\_id, date) Generate an xml file which will be output to the production IN folder for adjusted store orders
  - **ManualStoreOrderAdjustment**
    - Triggers the AdjustedStoreOrderProcess BPM process with manual input parameters
  - Start Process Form
    - This is so we can manually re-generate a specific file for a specific Date and DC
  
- ❖ Adjustment of SSIS package: 0.5 day
  - Adjustment of the p\_sync\_data job to trigger the Java endpoint which will kick off the BPM process. This is expected to branch off in parallel after the store order enrichment occurs.
  
- ❖ New Java process: 1 days
  - **GenerateAdjustedStoreOrderXMLFile**
    - ◆ New process to convert the xml output from the usp\_generate\_store\_order\_adjustment\_xml into file format and export it to a network location. This process also checks the creation of the XML file and reports failures if file not found.
  
- ❖ New email alerts: 0.5 day
  - On failure of the new BPM processes (AdjustedStoreOrderProcess or ManualStoreOrderAdjustment) an email alert specifying the cause of the error back to Nukon and RROA IT support on the same contact list as the current ReadyPlanner control-M Job failure.
  
- ❖ Testing/Deployment: 4 days
  - BDD tests to test the following transformation of data to expected results:
    - ◆ **usp\_generate\_store\_order\_adjustment**
    - ◆ **usp\_generate\_store\_order\_adjustment\_xml**
  - Creation of new java tests to ensure export of XML file works as expected. Testing in UAT different scenarios with best effort error handling.
  - Deploy to UAT and test integration with file system

Total Estimate from the above 11 days.

## 27 *Methods*

ASO will be in the same format as listed in the attachment below.

File structure, record sequencing and filename conventions will be preserved.



## 28 *Implementation*

New tables:

- store\_order\_adjustment\_xml\_log – stores the XML, run message and details for the adjusted store orders process
- store\_order\_adjustment\_roster – stores the roster for which the shipping locations are run
- store\_order\_adjustment – stores the records from the store orders which is used to generate the export XML

New stored procedures:

- usp\_sis\_store\_order\_adjustment\_xml – Runs the ASO generation and populates the store\_order\_adjustment\_xml\_log with XML and updated data.
- usp\_sis\_store\_order\_adjustment – populates the store\_order\_adjustment table

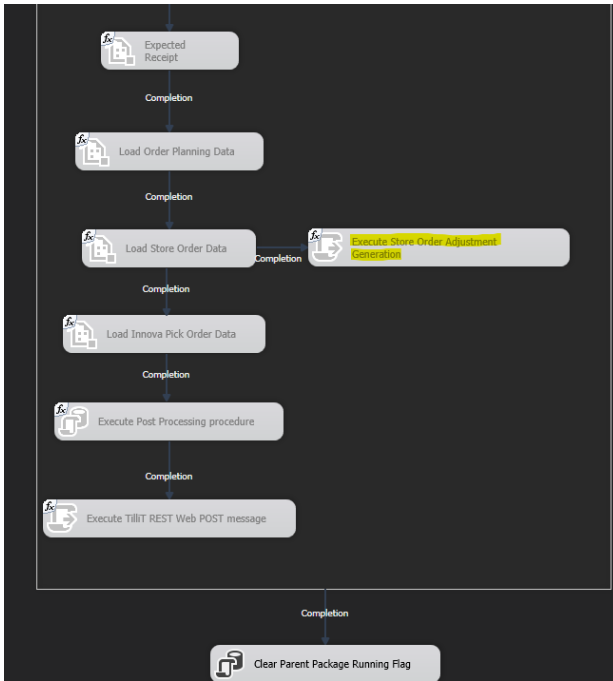
New Function:

- fn\_chk\_aso\_roster – returns the current shipping locations to run in the next p\_sync\_data run for adjusted store orders.

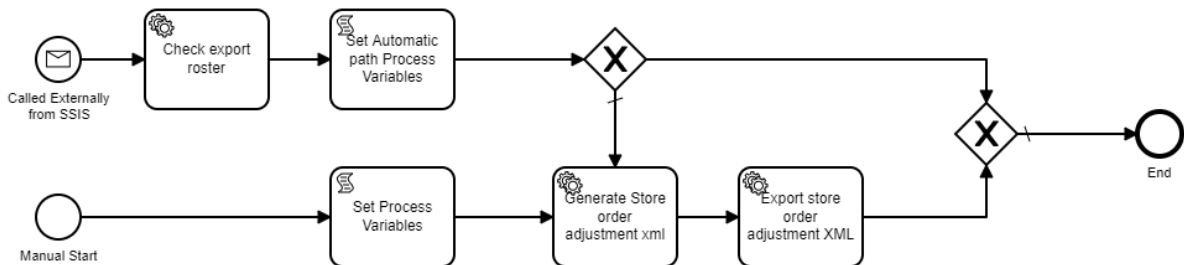
## 29 *SSIS Execution*

The p\_sync\_data SSIS task executes the Adjusted store orders immediately after the store\_order import and enrichment has been run. This runs in parallel to the rest of the p\_sync\_data SSIS tasks because it doesn't require any other data outside of the store\_order data.

To execute this process a BPMN workflow has been created that reads the store\_order\_adjustment\_roster table to determine which shipping locations to export for.

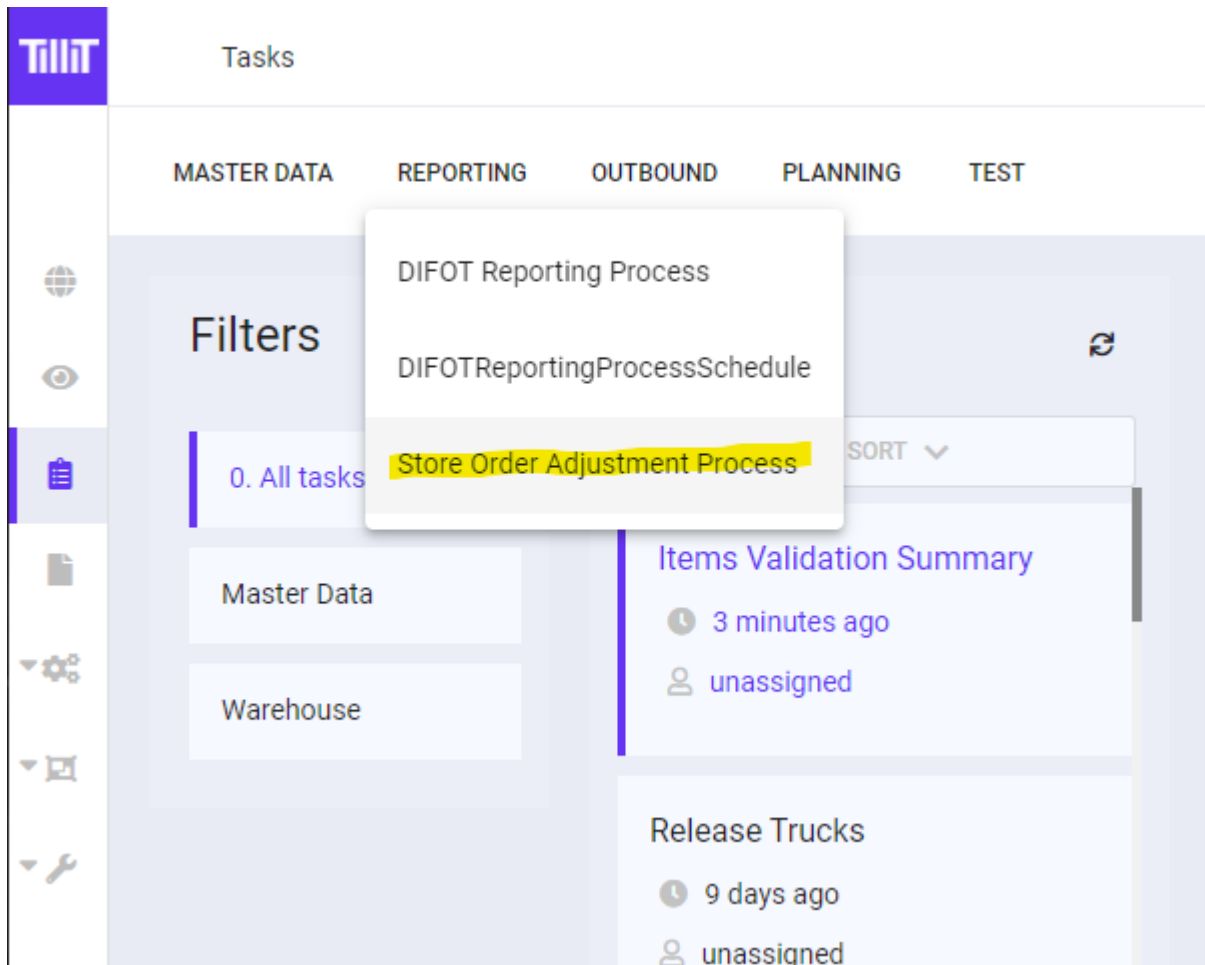


Executing the store Order adjustment process has two entry points. Either from a manual process or automatically through SSIS. When triggered from SSIS the function `fn_chk_aso_roster` is called to check which shipping locations to generate the adjusted store orders for. Whichever shipping location codes are returned are then used to generate the store order adjustment and then export the XML to the network location.



### 30 Manual Generation

New manual ASO generation process is located in the menu gateway under tasks -> Reporting -> Store Order Adjustment Process to allow for manual triggering of the export task to the network folder.



The Shipping Location Code takes one shipping location code. If none found it will do nothing. If a shipping location is found it will generate the XML for that shipping location using any orders with the matching Load Due date to the export folder the regular SSIS process puts the file.

Start Store Order Adjustment Process ✕

Shipping Location Code  
9270

Load Due Date  
19/05/2021

Run Store Order Adjustment?

**SUBMIT**



If the run Store Order Adjustment is ticked it will generate the records in the store\_order\_adjustment table but without it, it will only export the XML file based on the records currently in the store\_order\_adjustment table.

### 31 Store Order Adjustment Roster

The store\_order\_adjustment\_roster table is as below:

	id	active	start_time_minutes_from_midnight	end_time_minutes_from_midnight	run_type	repeat_after_x_minutes	shipping_location_id
1	32	1	0	1439	REPEAT	120	49
2	33	1	0	1439	REPEAT	120	58
3	34	1	90	840	REPEAT	120	47
4	35	1	300	NULL	ONCE	120	55

There are 2 types of roster records under run\_type, REPEAT and ONCE. If a shipping\_location is set to REPEAT it will use the repeat\_after\_x\_minutes value to trigger the store order adjustment process at the interval specified. This starts from the start\_time\_minutes\_from\_midnight and goes until end\_time\_minutes\_from\_midnight, repeating every repeat\_after\_x\_minutes time has passes since last run.

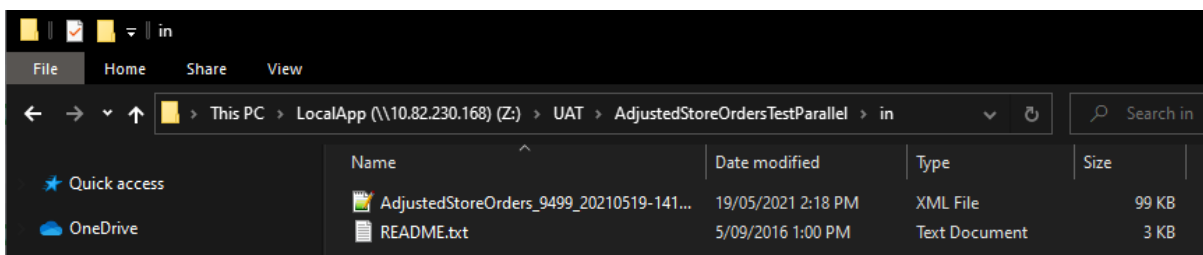
The ONCE run\_type will run the store order adjustment once after the start\_time\_minutes\_from\_midnight time has passed. For example if the start\_time\_minutes\_from\_midnight = 300 then after 5am it will run the process once.

### 32 XML Export Path

The current path set up for to export the files into are the following folders.

UAT: UAT\AdjustedStoreOrdersTestParallel\in\  
 PROD: AdjustedStoreOrdersTestParallel\in\

This path is stored as an application specific config file that is retrieved on start-up of the tillit-roa service. If this path needs to be changed a restart of the tillit-roa service is required.



If the file doesn't appear then checking the SEQ logs can help to understand what may have been the issue in exporting the file.

19 May 2021 14:24:58.505	HTTP response metrics. "POST /api/store-order-adjustment-xml-logs/create-xml-files?shippingLocationCode
19 May 2021 14:24:58.270	HTTP response metrics. "POST /api/store-order-adjustment-xml-logs/generate?runStoreOrderAdjustment=tru
19 May 2021 14:24:57.848	HTTP response metrics. "GET /api/store-order-adjustment-xml-logs/roster-check HTTP/1.1" 200 119 44
19 May 2021 14:24:57.661	HTTP response metrics. "POST /external/ssis/aso-generation HTTP/1.1" 200 null 198
19 May 2021 14:24:57.473	SSIS aso generation called

### 33 *Deployment*

All RRM DC were converted to the new Adjusted Store Order (ASO) process with the transition occurring safely over 4 weeks.

No issues occurred during the transition. The ASO deployment has made the systems better with good cross functional validation of a sensitive and high impact processes.

Thanks to the continued support of individuals and programs that have been working towards improved understanding and hardening of the complex processes used to send retail ready meat around the country at “breakneck speed”.

As a recap, we did this for the following reasons:

- Functionality currently using the “ReadyPlanner” application will transition to “Tillit” as an enabler to the decommissioning of ReadyPlanner
- Additional verifications have been developed in the “Tillit” instance to reduce the risk of data failures in EDI (an example being a non-numeric character sent to the gateway around Easter)
- Will transition one consistent process for all DCs and provide opportunity to simplify scheduling and system processes

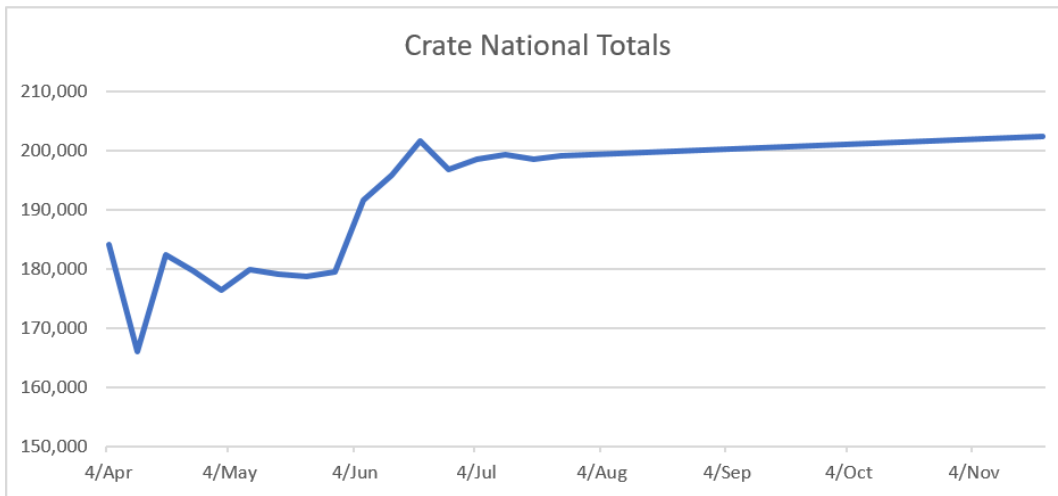
\* the Adjusted Store Order (ASO) Process: only applies to retail ready meat sites and the respective 4 logical DCs, has been vulnerable historically with any failure leading to short life product being left on the grid – not being distributed to stores, generally there have been few controls in place to detect issues.

### National Crate Output Forecast Uplift

The significant transport utilisation and outbound optimisation increases delivered by just the first release of TilliT, reported in the last milestone, have allowed RROA’s national crate delivery volumes to be increased by 18% as of June 6, 2022 which exceeded the expected 12% uplift.

There were 20% more loads being rounded with an 18% reduction in average cost per carton due to the increased truck utilisation.

### Forecast Volume Uplift

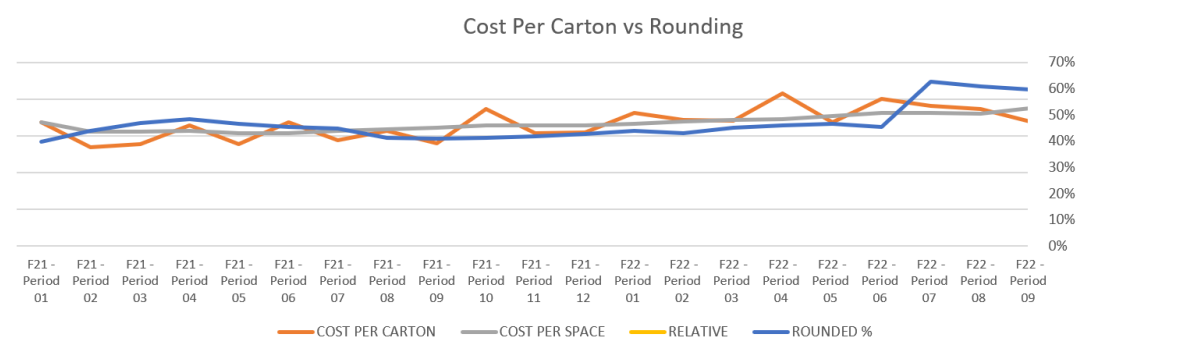


Current Average Crate Output	178,410	Crates
Forecast Average Crate Output	199,872	Crates
Forecast Increase in Crate Output	21,462	Crates
Forecast Increase in Crate Output	12%	Percentage Uplift

### Actual Volume Uplift

As can be seen in the chart below, in F22-Period 6, when the TilliT Release 1 went live, the average cost per carton has steadily declined by 18% (orange line). It is expected that there may be spikes during peak times such as Easter and Christmas, but overall the cost will continue to reduce.

In the same period the percentage of rounded pallet loads to complete and more efficient and well utilised loads has increased by 20% (blue line).



### Pre-Pick Order Development

Code is continuing to be developed to pre-pick before an order is received. The process will involve pre-picking approximately 60% of an order to balance the load, then finalise the order when the actual order is received. This functionality is being optimised through experimentation with the pre-pick percentage amount to avoid overpicking an order. The pre-picks are based on previous customer sales order history for any particular day.

Previous to TilliT the any pre-picking was completed manually. TilliT will now automatically generate the optimised pre-pick percentage of each SKU for each order on any particular day.

## 34 Milestone 3

Incremental growth of Red Meat and network changes have significantly increased the duration and volume of Beef and Lamb primals to be stored at Retail Ready Operations Australia (RROA). These changes to the Coles network included:

- Up to 150 tonne of Beef primals destined for Corned Beef processing; enabling:
  - the relocation of the external storage site, in a next door facility, to the destination processor to reduce transport costs and enable additional sources of supply of red meat primals for corning processing
  - increased processing for corned beef products for Coles between 80 to 120 tonnes per week
- Up to 80 tonne of Beef grilling steaks to be processed at a state of the art meat processing facility, transitioned from processing in Coles supermarkets; enabling
  - Reinvestment of labour into customer facing activities to promote sales and availability of Red Meat products
  - Improved quality controls, more standardised, higher quality processing and improved traceability
  - Relocation of the storage of primals from Coles finished goods DCs enabling prolonged asset life and reduced costs for Coles DCs

Coles RROA's Inbound capacity is insufficient to store all inventory and thus offsite storage is required from external parties.

Initial scoping of the solution identified a number of challenges which needed to be resolved in the digital solution:

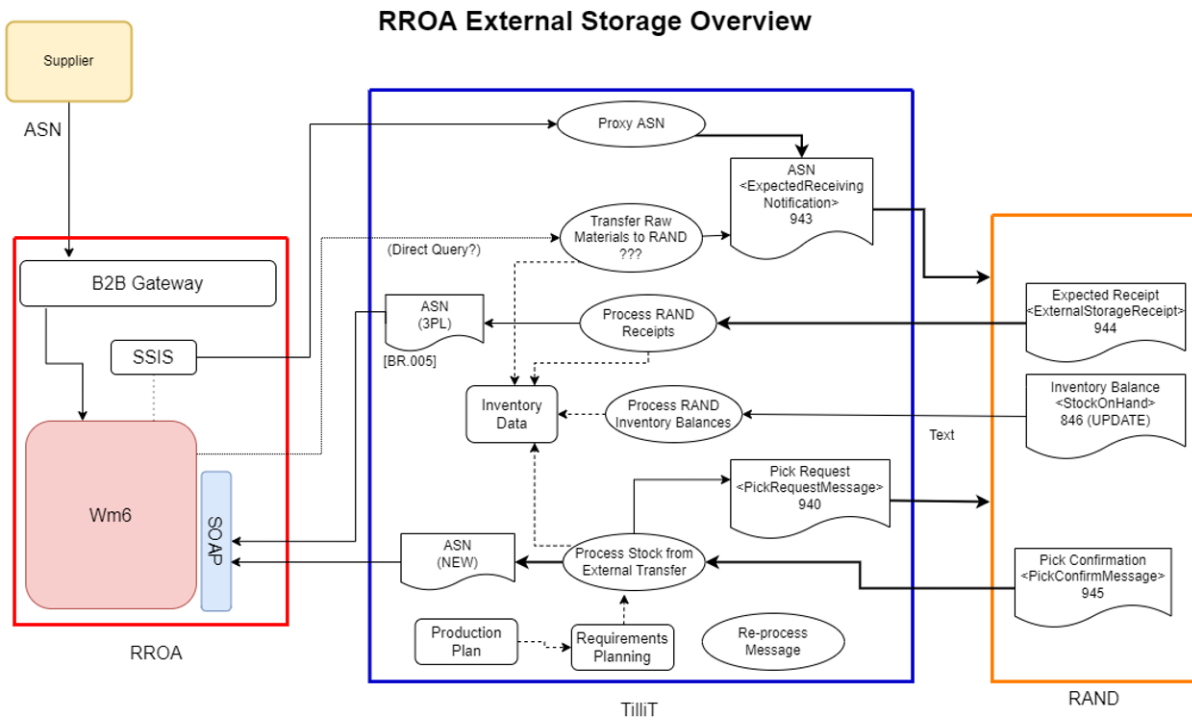
- Coles B2B portal and upstream management of B2B was unable to manage multiple delivery points for Beef and Lamb orders destined to RROA
- The preferred external storage provider did not have the systems capability to manage the granular detail of Red Meat inventory required for short shelf life management and traceability
- Existing systems in the RROA solution did not possess the capability to cross dock orders between sites
- Provide inventory visibility
- Avoid product multiple handling at both RROA and the third party site which adds time, complexity and errors to the inventory process.

In order to reduce the multiple physical touch points, avoid data duplication and streamline operations, the next phase of the Faster Fresher Flows initiative was to integrate RROA's Warehouse Management System (WMS) with the external storage supplier's WMS.

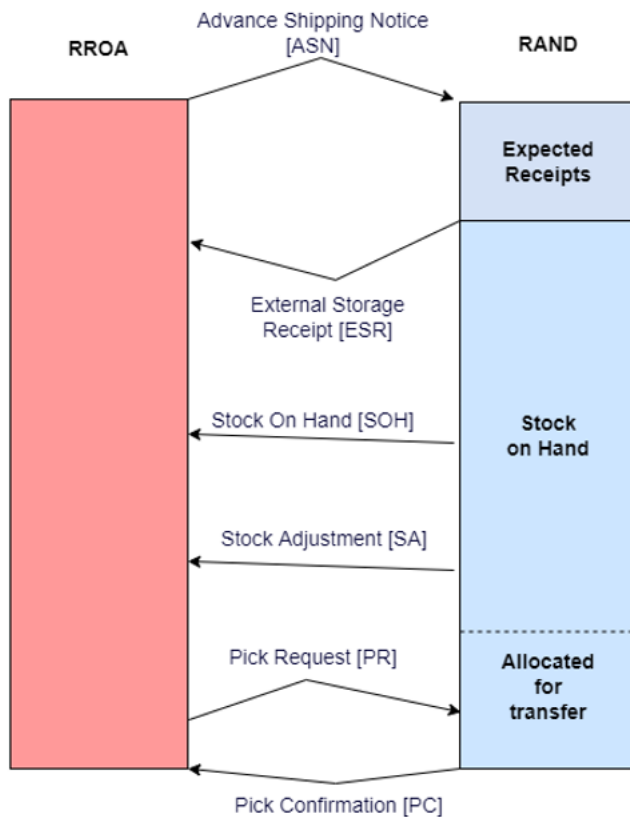
### 35 Development of TilliT Release 1 Production Planner, External Storage Integration

The following is the Functional Requirements Specification for the software developers to expand TilliT in order to implement the new external storage integration functionality.

### 36 Overview Diagrams



## RAND External Storage Message Overview



### 37 Business Process Description

1. In a normal situation, we receive ASN from B2B and receive the physical inventory at RROA in WM6. This will create trans, TU/LU info as per normal and will generate receiving report for the finance team.
2. If we want to redirect the shipment to RAND:
3. We receive the ASN in WM6.
4. TilliT picks up the ASN info from the ER/ASN and ER line/ASN line tables, creates the ASN and sends it to RAND.
5. There is no update on the status of the ASN and ER in WM6 at this time.
6. RAND receives the physical stock based on the ASN sent by TilliT and sends a receipt confirmation message.
7. TilliT using the same ER ID, will generate a new message type ex “3PL” or any other 3 char name for the ASN and sends it to Swisslog WM6.
8. WM6 will pick up the ASN message type and identify that it needs to do the following:
9. Update the ASN/ER & ASN line/ER line status and quantities as received(like it is normally updated when we receive the physical stock).
10. The ASN/ERs will be archived now as normal.
11. Add a transaction in the trans table, so that the finance team can pay the original supplier and do not have to wait until the stock is sitting at RAND. Below are the details of the query(not relevant to you) that is used to create the receiving report.

```

12. <queryString>
    <![CDATA[SELECT pc.product_category_id,to_char(t.create_date,'dd-Mon-yyyy'), (select contact_id from contact where contact_key =ex.contact_key ) supplier_code,(select
description from contact where contact_key =ex.contact_key ) supplier_name,p.product_id,p.description, t.to_er_id, t.from_uom_id,
sum(t.trans_quantity),SUM(t.trans_quantity*t.FROM_LU_WEIGHT),
ex.po_number po_number,next_day(to_date(to_char(sysdate,'dd-Mon-yyyy'))-14,'MONDAY'), next_day (to_date(to_char(sysdate,'dd-Mon-yyyy'))-7,'SUNDAY')
FROM Trans all t, product p, PRODUCT_CATEGORY pc, (select expected_receipt_id, po_number, contact_key from expected_receipt union select expected_receipt_id, po_number, contact_key
from expected_receipt_archive) ex
WHERE p.product_category_key = pc.PRODUCT_CATEGORY_KEY AND p.product_id = t.from_product_id AND ex.expected_receipt_id = t.to_er_id AND t.transaction_type IN
('EXPECTED_RECEIPT_CHECKIN','ASN_CHECKIN') AND t.operation id = 'ManualReceiving' AND to_date(to_char(t.create_date,'dd-Mon-yyyy'),'dd-Mon-yyyy') BETWEEN CASE WHEN SP(startDate) is
not null then to_date(to_char(SP(startDate),'dd-Mon-yyyy'),'dd-Mon-yyyy') else next_day(to_date(to_char(sysdate,'dd-Mon-yyyy'))-14,'MONDAY') end and CASE WHEN SP(endDate) is not
null then to_date(to_char(SP(endDate),'dd-Mon-yyyy'),'dd-Mon-yyyy') else next_day (to_date(to_char(sysdate,'dd-Mon-yyyy'))-7,'SUNDAY') end
GROUP BY t.transaction_type,to_char(t.create_date,'dd-Mon-yyyy'), p.product_id,t.to_supplier_name, p.description,t.to_er_id, pc.product_category_id, t.from_uom_id, ex.po_number,
ex.contact_key
ORDER BY to_date(to_char(t.create_date,'dd-Mon-yyyy'),'dd-Mon-yyyy')]]>
    </queryString>

```

13. When we intend to get the stock for this ER from RAND, they will send us an ASN for the stock that they are sending that will flow through normally from RAND → TilliT → WM6.
14. However, there will an additional tag added in this ASN called <originalSupplier>. The message type will still be “NEW”.
15. RROA will receive the stock as per normal by scanning the pallets for the associated ASNs.
16. This will create the transport unit/load units in WM6. The load unit will have additional column as original supplier(Ex-Teys) along with the current supplier column(RAND).
17. The trans would add the info for original supplier and current supplier so that finance team when look at the receiving report will understand that they just need to pay RAND, and not the original supplier. (The receiving report will need to be updated).
18. The ERs/ASNs will be closed and archived as per normal. Swisslog will need to confirm if the archiving process will be impacted as we will have 2 ERs with the same name

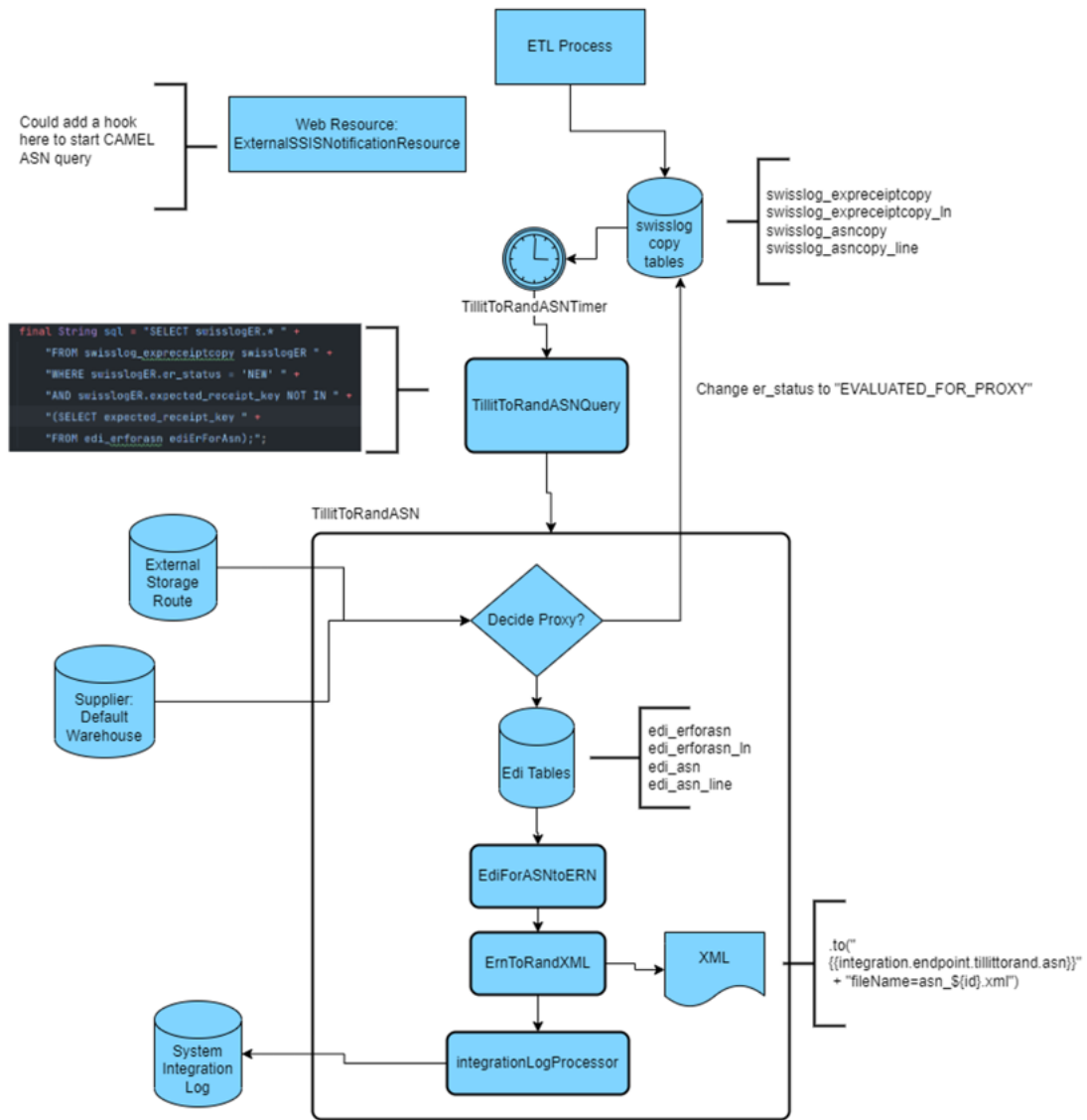
38 Business Requirements – ASN Integration to RAND

No	Description	So That
<b>BR.001</b>	TilliT to direct query WMS to obtain ASN details from Suppliers. These details should be loaded and stored in a table that can be passed to RAND.	Inbound ASN details from Suppliers in Swisslog are known to TilliT
<b>BR.002</b>	TilliT to send any new / unsent ASNs received by xml file to file stage	Inbound ASN details from Suppliers in TilliT are sent to RAND
<b>BR.003</b>	User Interface in TilliT to reprocess any failed ASNs to RAND; or extract any previously sent messages	In the event of a transmission failure or issue, that the process can be supported by resending or validating data
<b>BR.010</b>	The data loads for all host message transactions should be timely (every 15 minutes) to reflect new ASNs, receipts etc.	Records can be created before decisions are made relating to incorrect data and product can be received using ASN receiving processes (RAND is located < 500m away geographically)
<b>BR.011</b>	Transactional data from file stage and direct query should be stored completely and at the most granular level wherever practical	To ensure that data is available for broader process and business

		<p>reporting purposes and troubleshooting.</p> <p>To reduce future development effort associated with expanded data requirements.</p>
--	--	---

39 Process Flow

### Proxied Advanced Shipping Notice

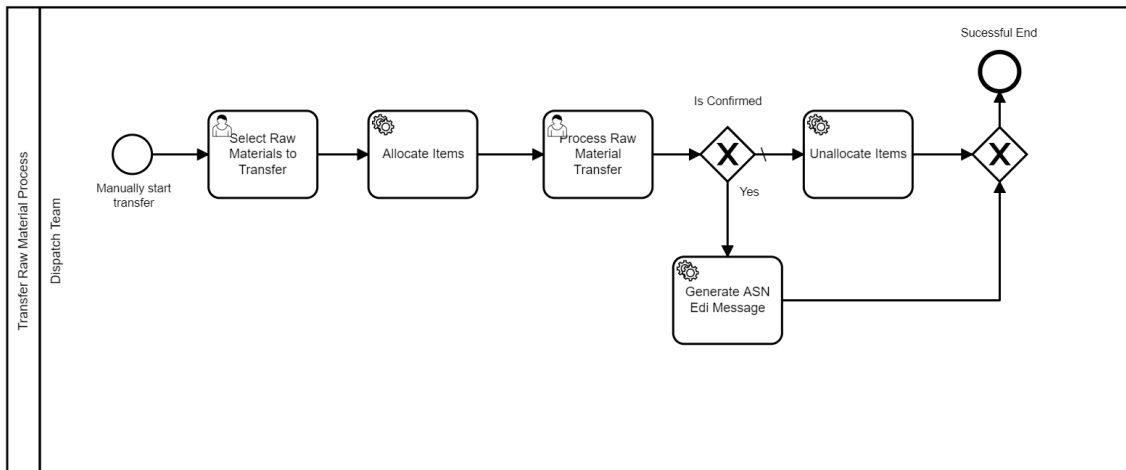




40 *Business Requirements – Transfer RAW Material from RROA to RAND*

No	Description	So That
<b>BR.018</b>	TilliT to direct query Swisslog to identify transactions relating to shipment from RROA to RAND	TilliT has visibility of expected despatches from RROA to RAND
<b>BR.019</b>	Inventory shipped/adjusted from RROA is reflected as in-transit inventory and included in network stock calculations	RROA retains a comprehensive visibility of inventory
<b>BR.020</b>	TilliT to stage shipped/adjusted pallets to be collated in a UI to enable a user to process a shipment when finalised	One ASN is sent to RAND with the necessary despatch details needed for RAND integration
<b>BR.021</b>	ASN to be processed from RROA to RAND for related shipment details; once processed the pending ASNs should be removed.	RAND can receive the related shipment via the ASN process
<b>BR.022</b>	The ASN processing screen should have capability to populate any additional information required for ASN transmission (e.g. supplier code)	All necessary data for the ASN transmission can be sent to the vendor (RAND)
<b>BR.023</b>	User selection of ASN processing screen details should be limited in relation to transfer vendors etc – this should be reflected through the use of any relevant summary fields in the Supplier/Ship To Locations Field settings	User errors and time to populate data is reduced
<b>BR.024</b>	Efficient data extraction methods for Swisslog data are used such as referencing the most recent index on TRANS_KEY were deemed necessary	Database processing resources for Swisslog are reduced

41 Process Flow



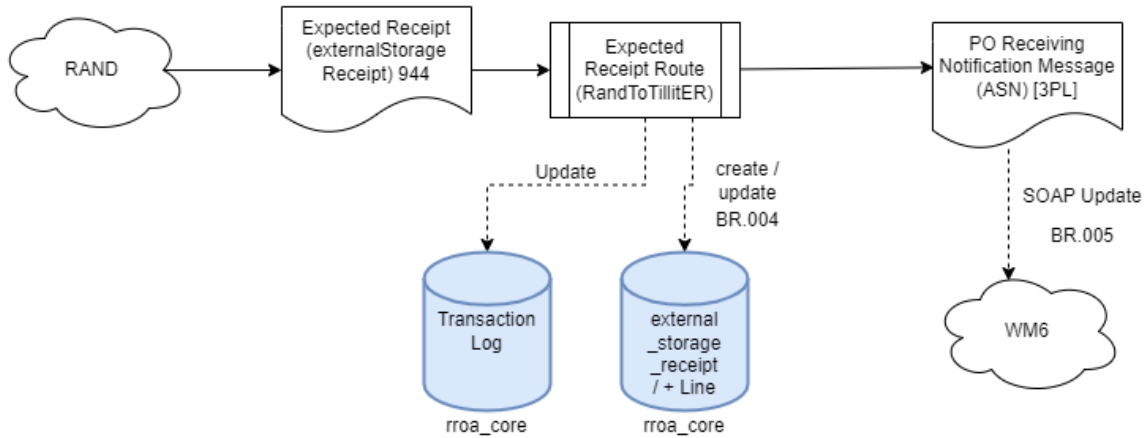
42 Business Requirements – Expected Receipt Integration from RAND

No	Description	So That
<b>BR.004</b>	TilliT to load Receipt Messages from RAND via a xml file to file stage. Transactions should be stored in a table to enable downstream processes.	Receipt Transactions can be captured for integration and reporting purposes
<b>BR.005</b>	TilliT to process ASN message updates to Swisslog to Close / Reduce the quantity of any outstanding ASNs in Swisslog contained in the RAND Receipt Process via a SOAP message	Outstanding messages in Swisslog can be closed out to prevent false anticipation of stock arrivals and incorrect ASN processing.
<b>BR.010</b>	The data loads for all host message transactions should be timely (every 15 minutes) to reflect new ASNs, receipts etc.	Records can be created before decisions are made relating to incorrect data and product can be received using ASN receiving processes (RAND is located < 500m away geographically)
<b>BR.011</b>	Transactional data from file stage and direct query should be stored completely and at the most granular level wherever practical	<p>To ensure that data is available for broader process and business reporting purposes and troubleshooting.</p> <p>To reduce future development effort associated with expanded data requirements.</p>

43 Process Flow

This section describes how data is updated in RROA on receipt of inventory at the external warehouse.

### Expected Receipts From RAND



This workflow describes the process of receiving Expected Receipt messages from RAND:

- This process is event based, and kicks off when an Expected Receipt message is received from RAND
- The Expected Receipt Route processes the message as follows:
  - It creates an external\_storage\_receipt record and associated lines in the TilliT database
  - It creates an ASN XML message and submits it to the 3PL Swisslog SOAP interface to process the update against the ASN
  - Finally, the Transaction Log record in TilliT is updated to record the message details.

44 Business Requirements – ASN Integration from RAND (Stock Transfers)

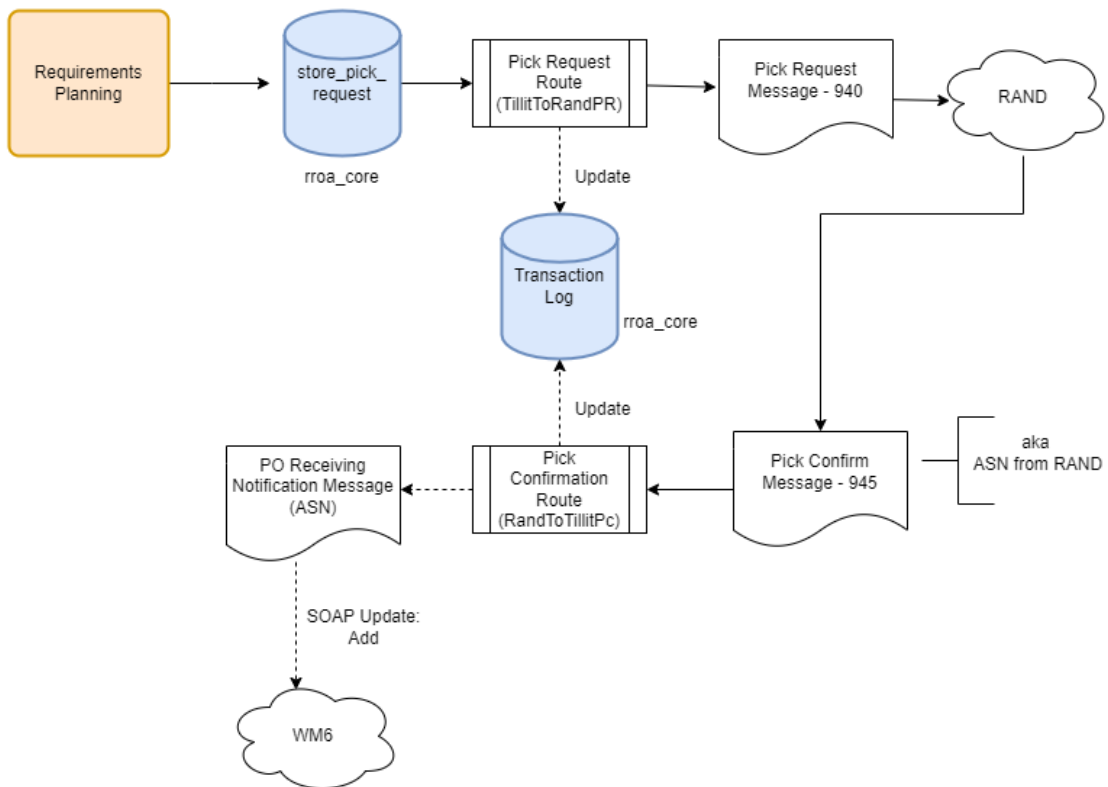
This solution addresses the capability of being able to request stock from RAND, and the associated interactions thereof. This addresses the following points:

No	Description	So That
<b>BR.006</b>	TilliT to load ASN messages from RAND via a xml file from file stage. Transactions should be stored in a table to enable downstream processes.	Despatch Transactions can be captured for integration and reporting purposes; ASNs from RAND can be processed from RAND to Swisslog to enable ASN receiving at RROA
<b>BR.007</b>	TilliT to process ASN message loads to Swisslog to create the ASN receiving message for goods despatched from RAND.	Outstanding messages in Swisslog can be closed out to prevent false anticipation of stock arrivals and incorrect ASN processing.
<b>BR.008</b>	ASN Messages sent from TilliT to Swisslog should be reconciled against ASN data from Swisslog to ensure successful load of data	Automated reprocessing and alerting of failed messaging can take place

<b>BR.009</b>	Appropriate alerting and failure management should exist to manage failures in message submission between systems	Support teams can respond appropriately to failed messages
<b>BR.010</b>	The data loads for all host message transactions should be timely (every 15 minutes) to reflect new ASNs, receipts etc.	Records can be created before decisions are made relating to incorrect data and product can be received using ASN receiving processes (RAND is located < 500m away geographically)
<b>BR.011</b>	Transactional data from file stage and direct query should be stored completely and at the most granular level wherever practical	To ensure that data is available for broader process and business reporting purposes and troubleshooting. To reduce future development effort associated with expanded data requirements.

45 Process Flow

### Stock Transfer from External Location



46 *Track and Trace*

This capability is to address retaining an audit trail of files sent and received between TilliT, SWISSLOG and RAND, both success and failure. The purpose of this is to assist in troubleshooting issues within the system and providing visibility of successes and failures of messaging between the 3 systems when it comes to external storage.

47 *Business Requirements – Reporting*

No	Description	So That
<b>BR.012</b>	A consolidated view of Network Receipts and Inventory Movements can be accessed and queried by respective business units.	To ensure that core business data is preserved to enable: <ul style="list-style-type: none"> <li>· Invoice verification against all receipt points</li> <li>· Business / Supplier MLOR DIFOT KPIs against all receipt points</li> <li>· Traceability requirements</li> </ul>
<b>BR.013</b>	Network Inventory position should be reconciled in end of day processes and stored in snapshot views and sent to the business as per CHOP files	To ensure that the business can assess inventory position through CHOP application processes.
<b>BR.014</b>	Views to extract and troubleshoot inventory issues should include RAND and RROA inventory – including traceability requirements (not currently in scope of MRP)	Troubleshooting and trace processes can be preserved
<b>BR.015</b>	All data created as part of the integration and MPR processes relating to outside storage should be managed to the data archive and production data limited	Applications and processes utilising the data archive can manage the data; and that operational server space is limited
<b>BR.016</b>	Data extract and visualisation capabilities to provide as-is reporting on data relating to inventory movements and stock positions	Business users can access data in similar methods to those being used for traceability, financial reconciliation and KPI management purposes
<b>BR.017</b>	At Risk and Shortfall material views should include RAND inventory	Material risk can accurately be assessed

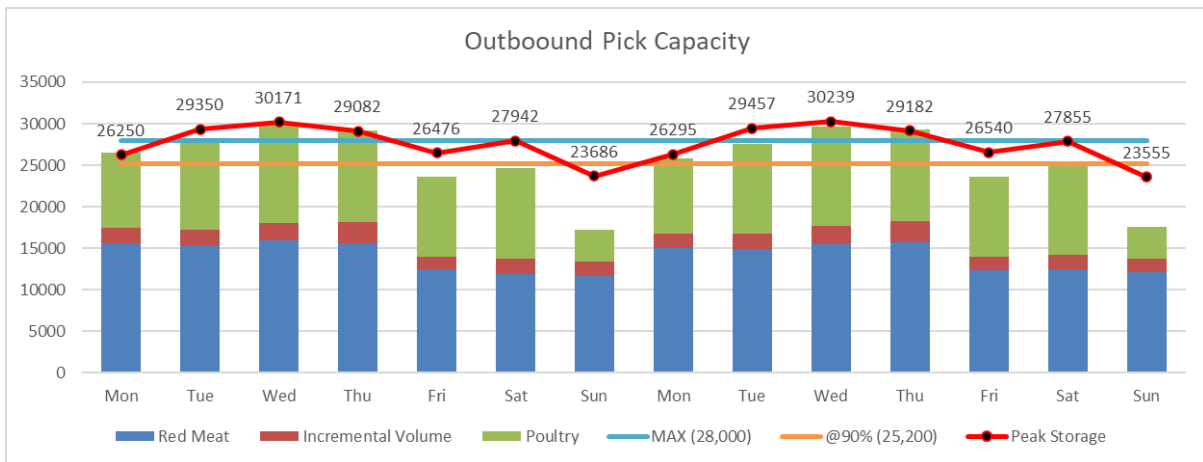
## 48 Milestone 4

Milestone 4 continued the development of Phase 2 TilliT development to support the Red Meat Production Planning & Scheduling modules. User interface for data creation, order optimisation, live schedule, parameter configuration and advanced analytics.

## 49 Unlock capacity to enable future plant growth

Prior to the implementation of TilliT and supporting applications, and their Faster Fresher Flows (FFF) enhancements, RROA was assessed for its production, storage and picking capacity and found to be insufficient to handle volume from contract manufacturers. However after FFF, RROA’s production, storage and pick capacity increased to such a great degree that 100T of volume from our Queensland contract supplier was able to be handled by RROA.

The increased capacity across RROA has unlocked the ability for additional future growth.



## 50 Improve freshness of red meat

The FFF initiative has allowed 1 day to be taken out of the supply cycle at RROA by enabling Production and Despatch to be completed on the same day and thus into the store on Day 3 unlike our contract suppliers who supply into store on Day 4.

Contract Supplier - Supply Profile (NSW) = Day 1 for Day 4							
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Production	1	1	1	1			
Despatch		2	2	2	2		
Into DC			3	3	3	3	
Into Store				4	4	4	4

Retail Ready Operations Australia - Supply Profile (NSW) = Day 1 for Day 3							
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Production	1	1	1	1	1		
Despatch	1	1	1	1	1		
Into DC		2	2	2	2	2	
Into Store			3	3	3	3	3

## 51 Transition plan to roll out faster fresher flows initiative

During this milestone the transition plan was defined.

The warehouse order optimisation and improved store order lead times (FFF) rollout will start with Coles, then be rolled out to the other Red Meat contract manufacturers (Note: RROA is the only site with multi-channel capacity to de-risk the network transition and give contingency.)

### 52 Existing benefits on partial rollout

- Continued benefits from pallet rounding increasing truck utilisation
- Reduced need from pre-pick
- Flexibility in order rosters enabling holiday benefits
  - Over Christmas specific supply days will be turned off into DC to enable non-working days over the public holidays
  - Enables team members to have the days off for time with family over the holiday period without impacting supply or finished good availability.

## 53 Improving Customer Warehouse Optimisation

- ASO progress and update
- Continuing benefits in DC from slotting optimisation
- Challenges encountered since initial development
  - Design gap from original customer requirements due to alternate DC WMS configuration not identified in design phase – alternate process developed
- Establishment of community of practise relating to system changes
  - Improved incident response – resolving 2 instances of unrelated failures that would have otherwise impacted availability of red meat

## 54 Aligning Warehousing, Transport and Production Operations through Dynamic Scheduling

New developments:

- Live Schedule developed in-house by Digital Officer

> RROA > MANUFACTURING

REFRESH
Auto Reload (every 5 min)
TODAY Fri, 18th Nov 2022
EXPORT CSV

Lines  
LINE01

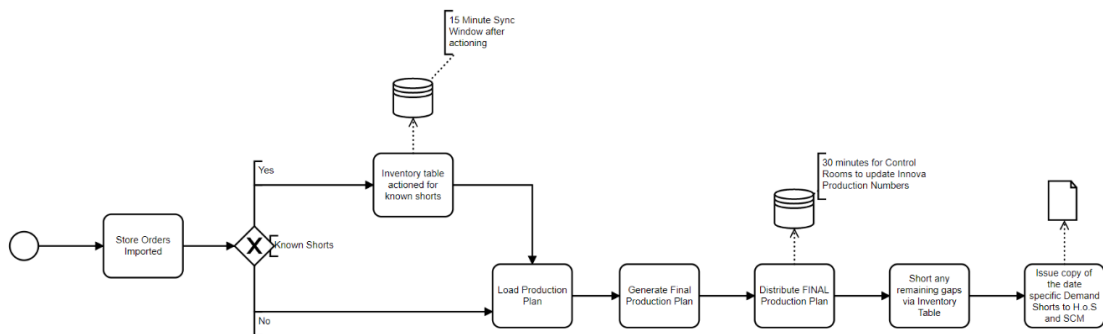
Facility  
All

No	Line	Plan Date	Start	End	Item Code	Description	Price	Planned Qty	Produced Qty	Remaining Qty	Rem Duration	Planned Duration	Raw Code	Raw Desc	Notes	Tray Size	UoM
1	LINE01	2022-11-18	08:30	10:15	8601707	BF RUMP STK (11X9) (RRM)	25	1106	526	580	105.1	200.5	434339	BF RUMP IW/VAC		11X9	
2	LINE01	2022-11-18	10:15	10:25		Tray Change 11X9 to 11X5		10	10	10	10.0	10					MIN
3	LINE01	2022-11-18	10:25	11:47	8598420	LB LOIN CHOPS (11X5) (RRM)	28	302	0	302	82.7	82.7	6848152	LB SHORTLOIN MW/VAC	Apply Spring Lamb Roundel	11X5	
4	LINE01	2022-11-18	11:47	11:57		Tray Change 11X5 to 11X9		10	10	10	10.0	10					MIN
5	LINE01	2022-11-18	11:57	12:35	3904734	LB BBO MIXED PACK (11x9) (FFF)	24	62	0	62	37.2	37.2	6848152	LB SHORTLOIN MW/VAC	Apply Spring Lamb Roundel	11X9	
6	LINE01	2022-11-18	12:35	14:33	8598985	LB LOIN CHOPS (11X9) (RRM)	28	322	0	322	118.5	118.5	6848152	LB SHORTLOIN MW/VAC	Apply Spring Lamb Roundel	11X9	
7	LINE01	2022-11-18	14:33	14:43		Tray Change 11X9 to 11X5		10	10	10	10.0	10					MIN
8	LINE01	2022-11-18	14:43	15:05	2741270	FR PK LOIN CHOPS (11X5) (FFF)	22	92	0	92	21.7	21.7	9028585	PK FREE RANGE TRADE MIDDLE		11X5	
9	LINE01	2022-11-18	15:05	15:15		Tray Change 11X5 to 11X9		10	10	10	10.0	10					MIN
10	LINE01	2022-11-18	15:15	16:14	3035395	PK F/O OUTLET (11X9)(FXO)	12	315	0	315	59.2	59.2	9028541	PK SHOULDER CUSHION IW/V...		11X9	

- TilliT capability enhancements
  - Improved visibility of production schedule against the picking schedule, enabling to the minute live alignment
  - Capability for picking parameters: changes to price, shorting product and Minimum Life on Receipt (MLOR) concessions by the production planner

Benefits unlocked:

- Lower inventory through better alignment of pick to production
- Faster pick rate and improved availability due to less administration
  - After rolling out some initiatives to enable pick and remove delays (Inventory shorts process – using new tables and functionality developed in TilliT. The process has created a systematic way of removing products from the picking requirement (where they are known to not be available), removing multiple layers of communication that previously existed and removing the resulting delays where picking would stop, adding to the constraint. Only shortages now are exceptions which can be investigated and understood for continuous improvement.



- This enhancement resulted in the drop in finished goods holdings
- Challenges in the RAND integration (Milestone 3)
  - Design complexity
  - SME departure and project team consistency
  - Integration with multiple solution partners



## 55 Milestone 5

Here is a recap the deliverables to date from RROA relating to the FFF Program.

- August 2020 – RROA conducted a Proof of Concept to identify the gaps in current state to future state – leveraging RROA’s ability to proactively identify dependencies and adapt workarounds to enable to test  
RROA collaborated with the Coles FFF Program team and IT departments to deliver the Business Requirements Document (BRD) for the FFF transition by comparing RROA’s capabilities to the other RRM network partners.
- January 2021 – RROA collaborated with the business to deliver an interim solution which enabled the Corned Beef Transition for RROA (exit of ACC) and use of the PnP channel which improved supply to stores and mitigated a number of impacts to RROA not solutioned in the EOI.  
To achieve the stated FG inventory cover in the EOI, RROA would have needed to discontinue SRX supply to FNQ & NSW and would have also encountered costly changeovers and buffer breaches – all resolved through the “interim” solution (developed in house at RROA - Leon)
- October 2021 – RROA extended the “interim solution” capabilities (through the delivery of systematic integrations) to enable the business to transition Poultry network to the FFF solution  
RROA actively led the requirements and integration design to enable the transition – this was developed with the transition principles in mind and minimal redevelopment was required to this solution in the end-state  
\* RROA absorbed the project costs of internal team members associated with the project and also funded some redevelopment of integration due to upstream defects identified in the Coles ordering system. The development of this functionality was activated as early as September 2021 (as well as interim solution) supporting the activation of BCP vendors during COVID to continue the supply of “Retail Ready Meat” (RRM) products

For the next part of the RRM activation:

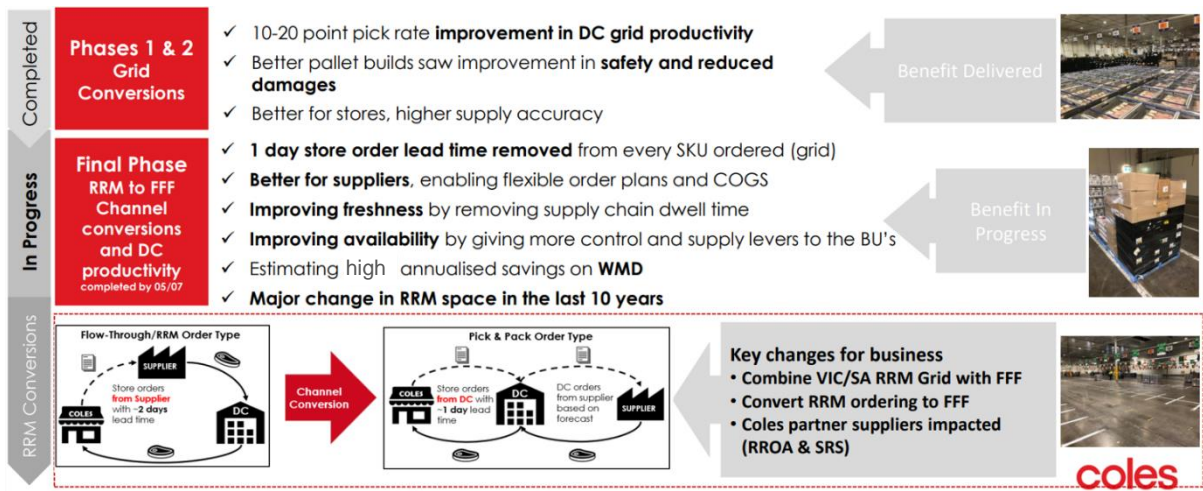
- December 2022 – RROA has commenced the recreation of all 23 new transition products and revalidation of 18 products.  
This involves the creation of all Swisslog, TilliT and Innova product definitions and production process definitions – this will be a large labour effort for the RROA team.
- February 2023 – RROA has been engaged to support our Victorian contract supplier during the transition to supply cross ranged products for the Beef and Lamb transition. Timing or range reviews and supply distributions (states supplied by each site) will be modified to support the contract supplier’s constraints to the transition approach.  
RROA is defining an opportunity to assist this pushing our site to near 100% capacity on MAP production (RROA wants additional volume) but will also be at a time of considerably high risk.  
RROA is also supporting the definitions of the contract supplier’s system infrastructure through a number of project queries relating to the RROA design (despite having taken deliberate steps to outline this for the project team during RROA’s definition of functional changes to deliver the FFF channel).

**Timeline and activity to map new products and production processes**

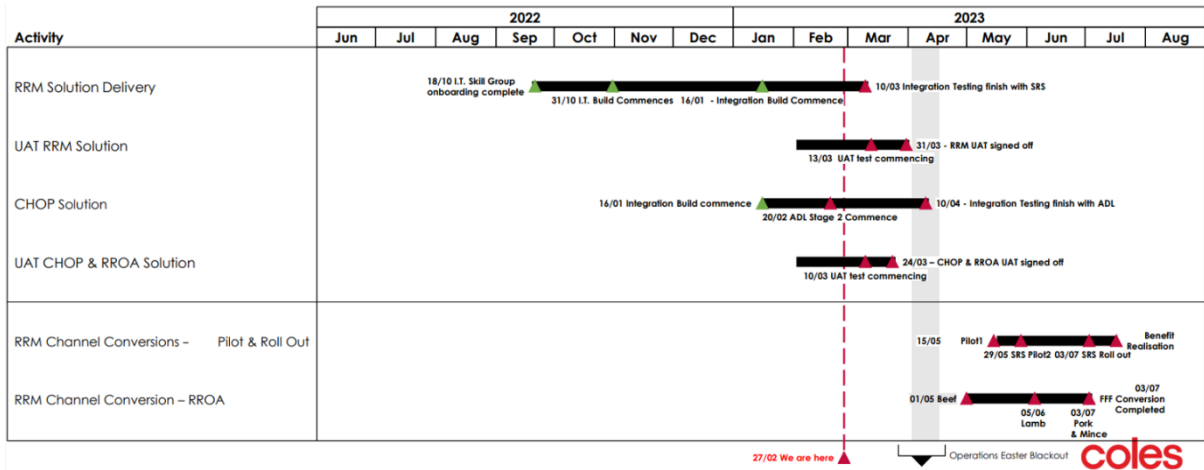
Type	Key	Summary	Status	Category	Assignee	Start date	Due date
▼	REMC-6	RRM to FFF Transition & Range Review	TO DO			24 Apr 2023	16 Jul 2023
>	REMC-21	Initial Scoping	TO DO				
+	REMC-9	Beef Layout Update (Vic&SA to RROA)	TO DO				1 May 2023
+	REMC-10	Lamb Layout Update (Vic&SA Volume to RROA)	TO DO				5 Jun 2023
+	REMC-11	Pork Layout Update	TO DO				3 Jul 2023
+	REMC-12	Mince Layout Update	TO DO				3 Jul 2023

**Progress to date for the program to improve freshness and inventory cycle**

Faster Fresher Flows is supporting the transformation of the business’ supply chain by continued investment into technology led solutions which has delivered a Faster Fresher Flows order channel for our Customers, by the removal of complexity across our legacy systems/processes and reducing store order lead time s and improving product freshness which aligns with the business’ Smarter Selling & Win Together Strategies. The result is a new supply chain channel, maximising freshness, speed and productivity in the network.



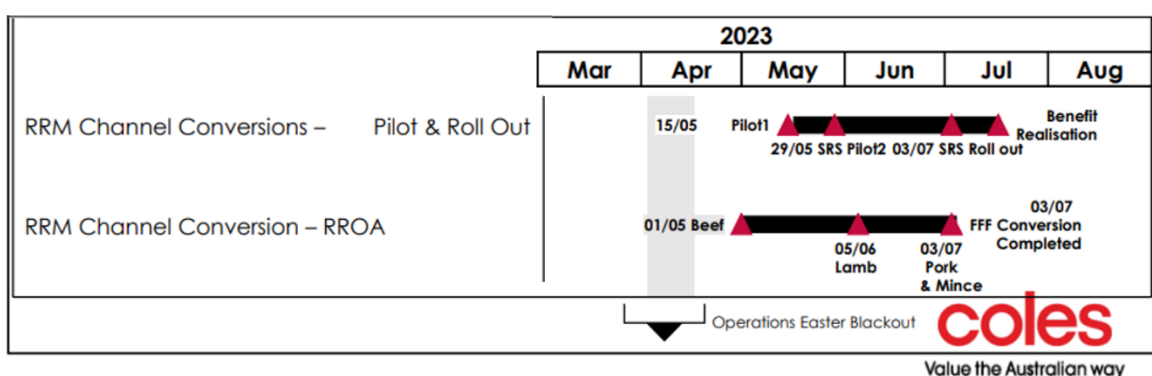
### Detailed Deployment Timeline



## 56 Milestone 6

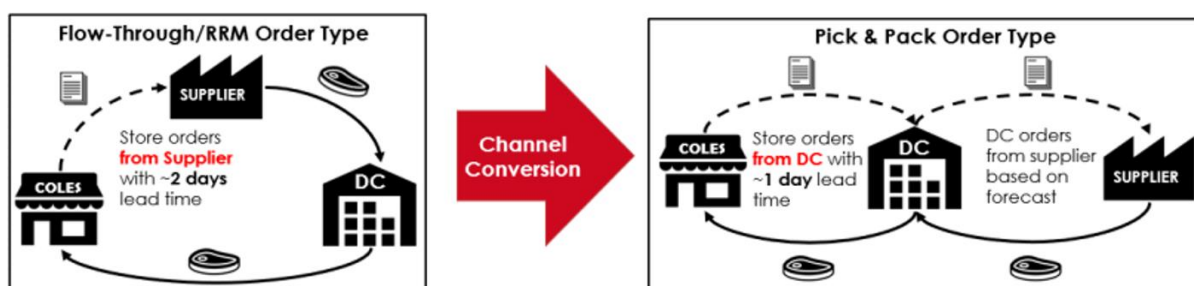
Milestone 6 of the Faster Fresher Flows program is the **final report**. As can be seen in the previous report, the culmination of this program will occur through **the deployment and testing of the code modules over the May to July 2023** period which is post this milestone. The target is to **reduce waste and markdown** through the **1 day reduction in the order cycle**, for all transitioned SKUs, which will be tracked post-implementation, amongst all the other benefits such as **fresher product, reduction in capacity breaches and optimised order picking and transport utilisation**.

Coles' contract supplier, will begin their conversion to the FFF channel a few weeks after RROA's conversion begins. RROA are taking the supplier's volume while they transition to limit impacts to the customer's order fulfillment.



In **Milestone 5** it could be seen that future volume growth, which is estimated to be an additional 100T per week across Red Meat by the end of July, would breach inventory capacity without intervention. The Faster Fresher Flows initiative has provided the business, the facility to manage the order profile to shape them in order to avoid breaching these capacity constraints.

**Milestone 5** also detailed the **transition plan for both RROA and contract supplier FFF** channels which will deliver the **1 day out of the order cycle by July 2023**. RROA will begin the transition first. RROA will take on the supplier's volume through their transition. **Approximately 90 SKUs** will be transitioned to the FFF channel.

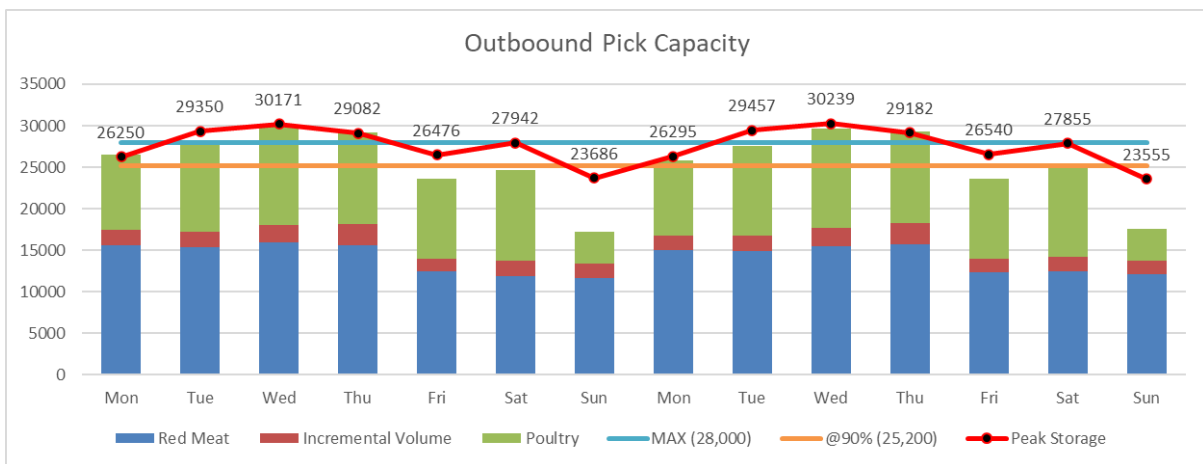


**Milestone 4** benefits were:

- Pre-pick optimisation
- Flexibility in order rosters enabling holiday benefits
- Customer Warehouse Optimisation - ASO progress and update with continuing benefits from the DCs dynamic slotting optimisation developed in Milestone 2.

- Improved incident response during system changes to reduce the impact on production and thus availability of red meat
- Dynamic Scheduling tool that optimised alignment between warehousing, transport and production operations.
- Improved visibility of production schedule against the picking schedule, enabling to the minute live alignment
- Capability for picking parameters: changes to price, shorting product and Minimum Life on Receipt (MLOR) concessions by the production planner
- Lower inventory through better alignment of pick to production
- Faster pick rate and improved availability due to less administration

The increased capacity across RROA has unlocked the ability for additional future growth of over 150T/week.



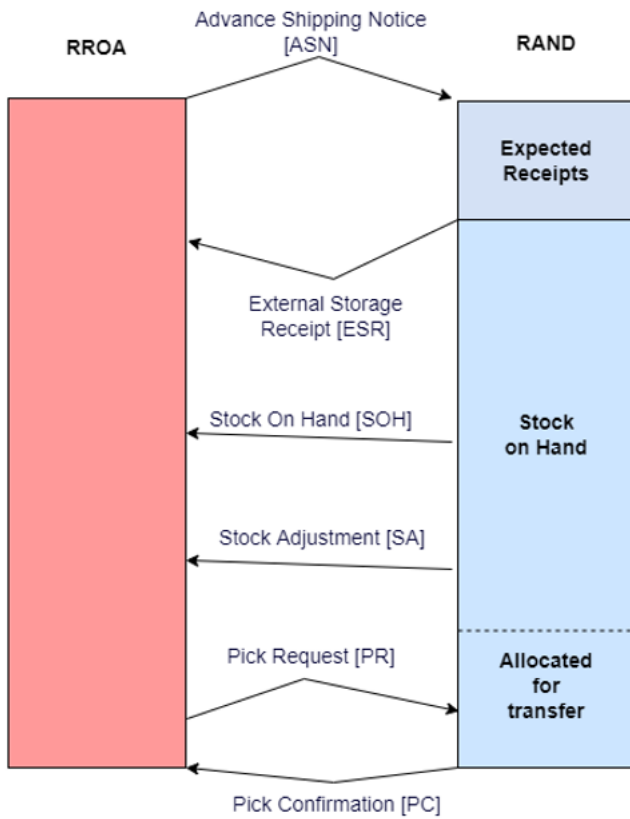
The FFF initiative has allowed 1 day to be taken out of the supply cycle at RROA by enabling Production and Despatch to be completed on the same day and thus into the store on Day 3 unlike our contract suppliers who supply into store on Day 4. This capability is now being rolled out for up to 90 SKUs.

Contract Supplier - Supply Profile (NSW) = Day 1 for Day 4							
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Production	1	1	1	1			
Despatch		2	2	2	2		
Into DC			3	3	3	3	
Into Store				4	4	4	4


Retail Ready Operations Australia - Supply Profile (NSW) = Day 1 for Day 3							
	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Production	1	1	1	1	1		
Despatch	1	1	1	1	1		
Into DC		2	2	2	2	2	
Into Store			3	3	3	3	3

**Milestone 3** integrated external inventory storage with our partner RAND, to ensure timely control of inventory and provide the customer (Coles) with transparency of stock to facilitate optimised order cycles.

### RAND External Storage Message Overview

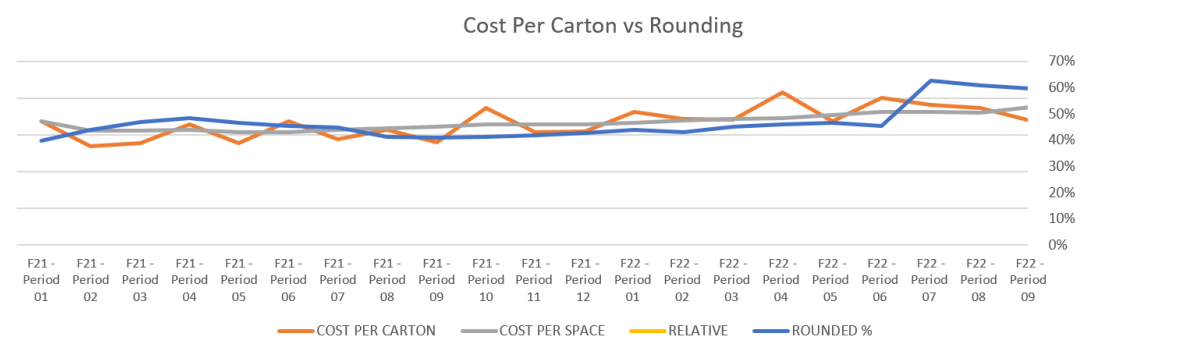


**Milestone 2** developed the **Adjusted Store Order module** for dynamically slotted DC grids to **optimise store order picking**.

Completed	Phases 1 & 2 Grid Conversions	<ul style="list-style-type: none"> <li>✓ 10-20 point pick rate <b>improvement in DC grid productivity</b></li> <li>✓ Better pallet builds saw improvement in <b>safety and reduced damages</b></li> <li>✓ Better for stores, higher supply accuracy</li> </ul>	<div style="background-color: #cccccc; padding: 5px; display: inline-block;">Benefit Delivered</div> 
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The significant transport utilisation and outbound optimisation increases, delivered by just the first release of TilliT, which was reported in the last milestone, have allowed RROA’s **national crate delivery volumes to be increased by 18%** as of June 6, 2022, which exceeded the expected 12% uplift.

There were **20% more loads being rounded with an 18% reduction in average cost per carton** due to the increased truck utilisation.



**Milestone 1** focused on the *design of the FFF channel* for RROA through a planned 3 month period, but achieved not just the design, but the *fully implemented release 1* TilliT module at a **45% below budget cost**.

TilliT Release 1 has enabled the ability to predict what orders are coming through to the Buffer Chiller in order to automatically schedule the picks and continuously build the pallet loads, rather than waiting for the entire order to be completed before building the pallet load. Additionally the loads are built in a way that optimises the truck load through evenly levelled layer pallet loads, that has increased utilisation by 15%.

The result of the optimised pallet loads was a **15% uplift in truck utilisation** moving from an average of 42 crates/pallet to 48 crates/pallet. This has resulted in a reduction in 51 B-Double transport movements which is a **46.5T reduction in greenhouse gases ie a saving of 235 trees per year**. This is just based on the minimal rollout achieved in the first phase release. Further benefits will be realised upon the final deployments in July 2023.

**Time savings of approximately 30%** for both loading at RROA and unloading at the DC have also been achieved with 2.4m double stacked pallets which are possible with the even layer level pallet loads.

**Improved utilisation of truck loads through layer leveling – 15% improvement**



## **Benefit to Coles and the wider Meat Industry**

This ***Faster Fresher Flows initiative*** showed that the strategy of employing ***license free, open-source development applications***, was a very ***cost-effective*** way of developing a ***tailored red meat application*** stack that integrates store orders to secondary processors, production execution and ***pick order optimisation at the processor, truck load optimisation, and coordination between processors and stores*** in order to select the best processor based on criteria such as price, packaging format, shelf life, machine availability etc.

Any other proprietary suppliers can leverage this approach to achieve faster, fresher, flows. Timeframe will be post RROA develop.

Other parts of the business have benefited from the solution such as Chef Fresh and non-Red Meat sectors.

## **Lessons learnt**

Due to the ***complexities of the meat supply chain***, with varying weights, varying prices per customer per store, multiple packaging formats with shorter or longer shelf-life and multiple suppliers to select from to fulfill customer orders, ***a more holistic and integrated approach was required*** to optimise the order to production to delivery process flow, in the supply chain. This meant, in order to achieve the highest level of optimisation, RROA, the Coles DCs and other associated ***suppliers***, all needed to be ***integrated via the same application stack***. However the benefit of 1 day out of the order cycle for RROA was achievable without the other suppliers being integrated. Having the other suppliers integrated allowed for the customer, via DCs, to have ***more options*** to fulfill orders in a way that minimised the order cycle and cost, while maximising shelf-life, ***in the face of any particular supplier issue***.

The ***customer can utilise information on the supplier sites, equipment, lines and people, by products and packaging format, accounting for shelf life constraints, in order to optimise the supply chain to leverage opportunities and bypass issues***. Information transparency provided to the customer allows the orders to be balanced across the week in order to do such things as produce short shelf-life product or packaging formats, on the highest volume consumption days and optimise across suppliers. The information across suppliers and within the supplier production profiles, informs the business which packaging formats to increase, to ***ensure multiple packaging formats are available for the various demand scenarios***. The FFF channels allow site capabilities to be shared with the customer to allow the customer to ***make appropriate orders across time which will optimise the supply chain to deliver the freshest product with the longest shelf life, utilising the transport channels in the most efficient manner***.



## **57 Conclusions & Recommendations**

### **58 Conclusions**

Milestone 1, 2, 3, 4, 5 & 6 have been successfully completed as per the original scope targets.

### **59 Recommendations**

This milestone 6, completes all 3 phases of development defined in the scope of this project and so the recommendation is for the MLA to approve and publish the public milestone 6 report.

60 APPENDIX - Supporting Documents

61 Appendix 1 Coles Group - Vision, Purpose & Strategy

