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Perspectives on Cold Chain logistics & Shipping Solutions

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Million TEU	2016	2017	2018	2019	2020	2021
Reefer container fleet	2.6	2.7	2.9	3.0	3.1	3.4
Total container fleet	37.9	39.3	41.5	42.0	44.0	50.0

Reefer market is growing at ~5% per year, the global container market only 3%

In 2021:

2.4m container level tracking devices were installed, growing at 16.1% Compound Annual Growth Rate (CAGR) and will reach 5.1m by 2026

4.1m remote tracking devices were deployed and this is growing at 17.4% CAGR – 9.1m by 2026

**“If wasted food were a country, it
would be the third-largest
greenhouse gas emitter on the
planet”**

(FLW 2016).



Food loss :

- food that gets spoiled or incurs reduction of quality and value during its process in the food supply chain

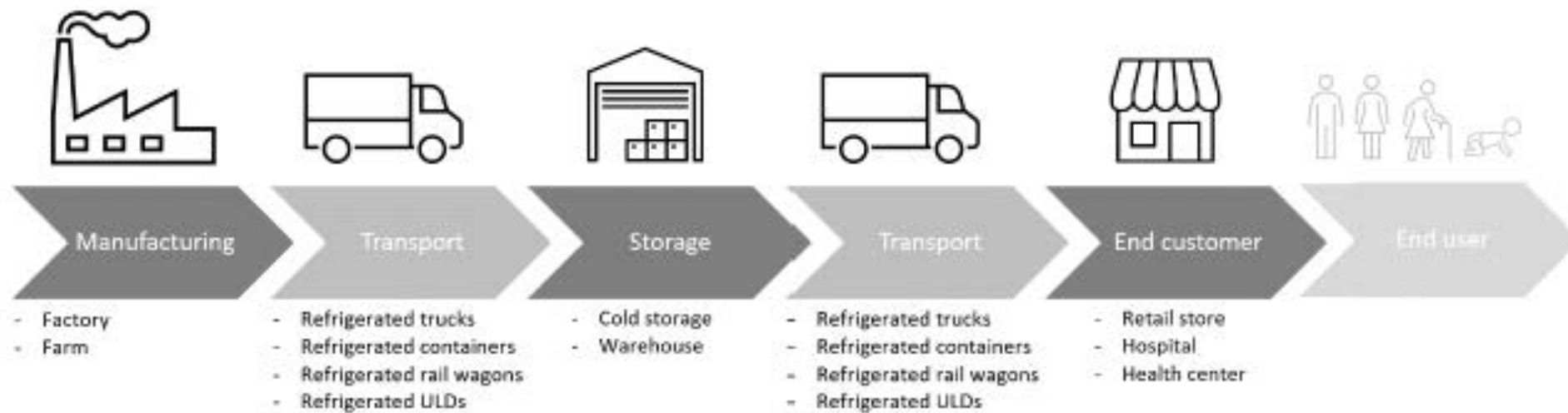
Food waste :

- food that completes the food supply chain but still doesn't get consumed because it is discarded, whether or not after it is left to spoil or expire

Food damage is also **more likely** to occur in the **transport and handling** of refrigerated product than at other stationary points ... resulting in food **losses** at the **consumer end** despite the **triggering event** occurring **earlier** in the supply chain.



Figure 2.1: The cold supply chain



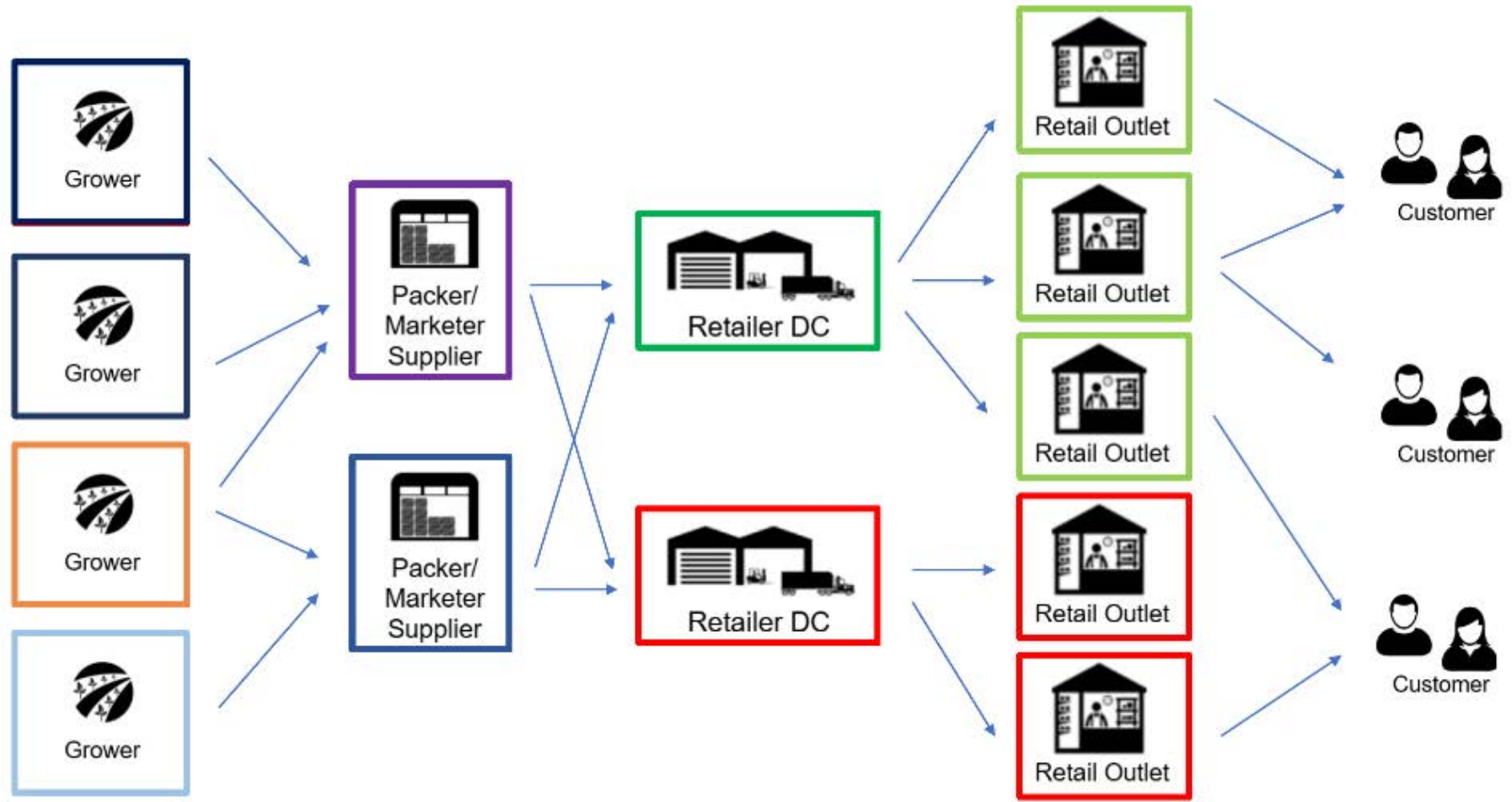
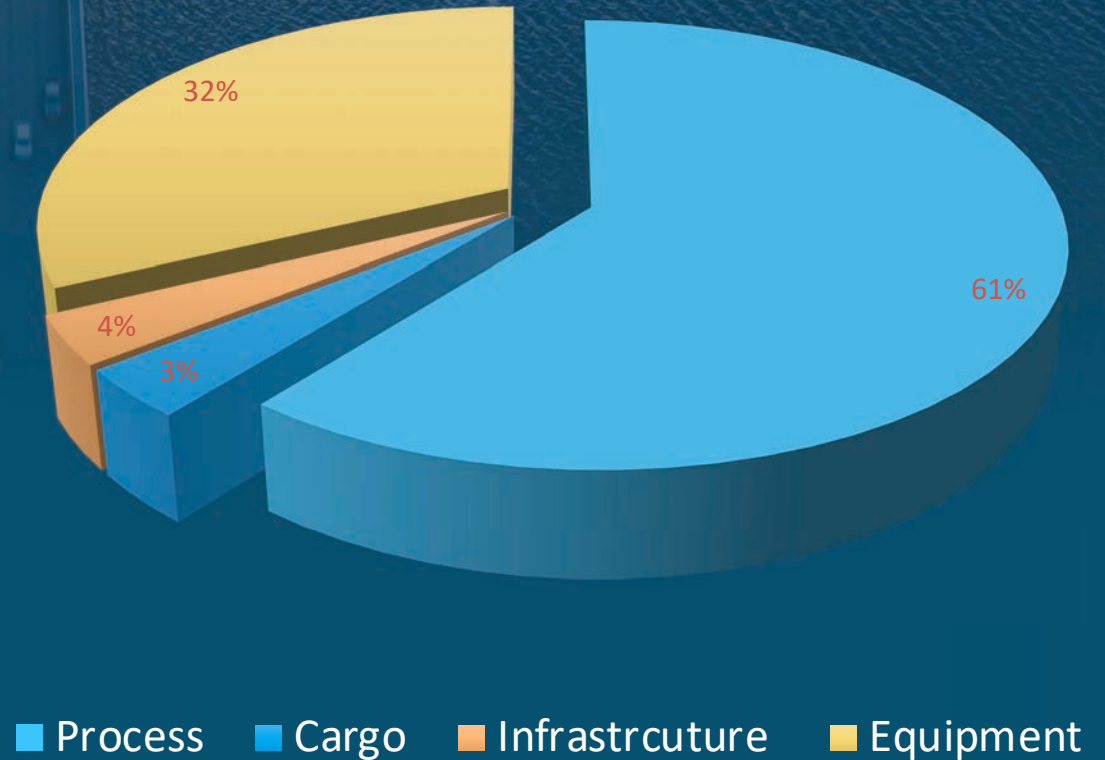


Table 6: Cold food chain failures

Category of failure	Cold food chain failure
People	Lack of suitable training and education/materials for training
Process	Absence of a process for goods handling or insufficient or inadequate process
Process	Lack of ability to verify that a process has been maintained throughout the chain
Process	No means of identifying process failure through the chain
Process	Failure to understand or properly implement an existing process
Process	Lack of product traceability
Process	Lack of validation of post-harvest treatment prior to pick-up
Process	Overloading the trailer
Process	Incompatible mixed loads
Process	Incorrect segregation in mixed loads
Process	Lack of regular cleaning of refrigerated spaces
Process	Incorrect or absence of pre-chilling
Process	Poor packing/stacking/wrapping
Process	Operational pressures that force mixed loads
Process	Poor demand forecasting, leading to over-supply and therefore an extended timeframe between transit and consumption
Process	Excessive transit distances – sub-par distribution planning
Process	HACCP – not just about hygiene, but also temperature
Process	Incorrect or high pre-loading temperature
Cargo	Badly designed loading docks, time delays, weather/temperature exposure
Infrastructure	Badly designed loading docks, time delays, weather/temperature exposure
Equipment	Training specific to equipment
Equipment	Lack of validation of refrigeration equipment and trailers
Equipment	Poor airflow in the trailer and packaging
Equipment	Lack of appropriate equipment at the right time
Equipment	Poorly repaired containers
Equipment	Poor maintenance
Equipment	Trailer age
Equipment	Poor air distribution in refrigerated space
Equipment	Poor trailer mapping

Cold Chain Failures



**A few links –
One category**



OR



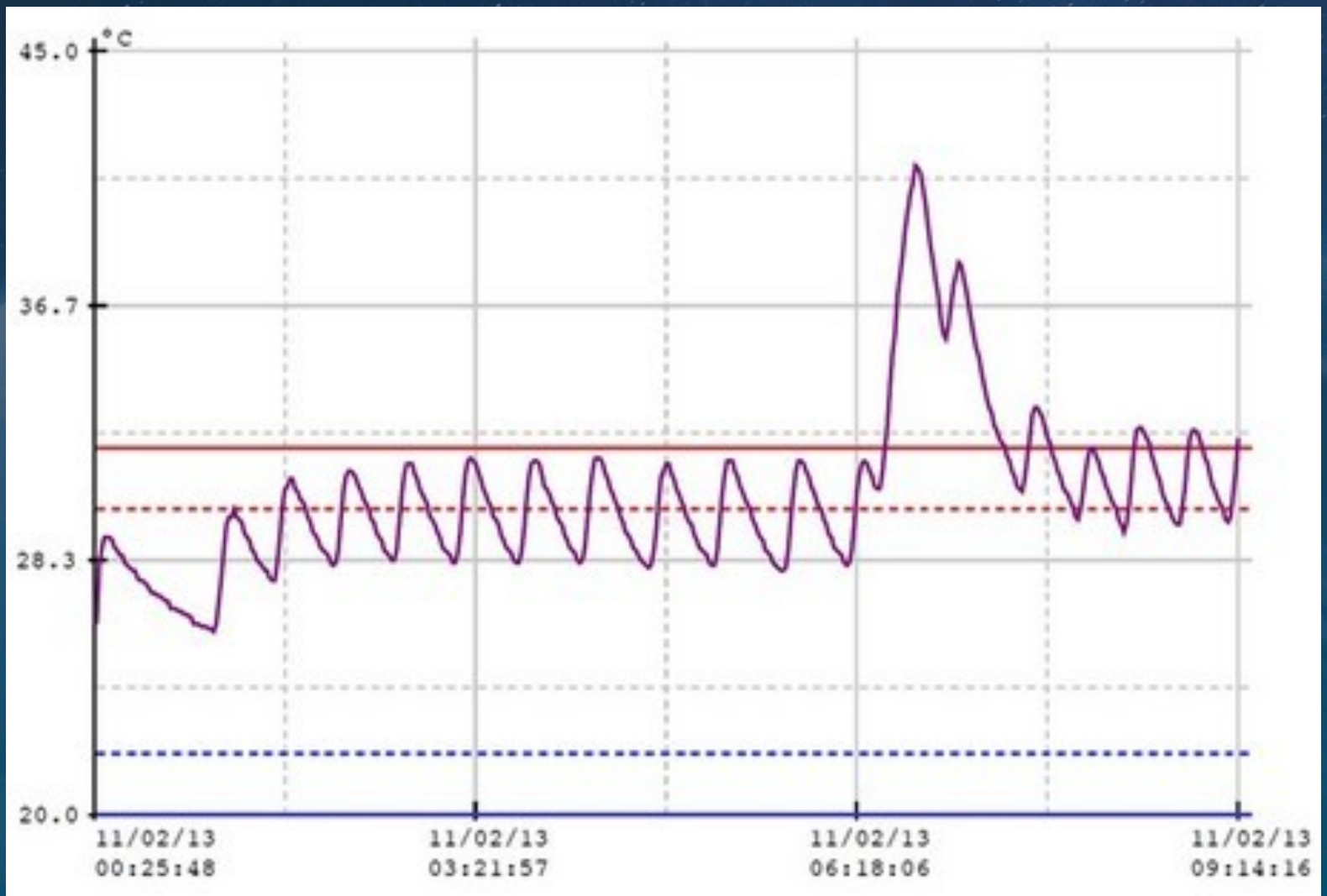
**Lots of links –
Many categories**

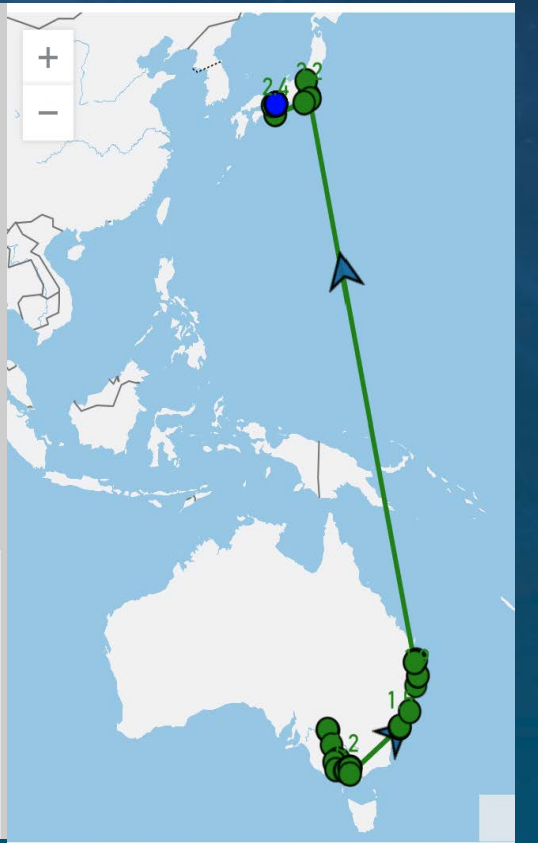
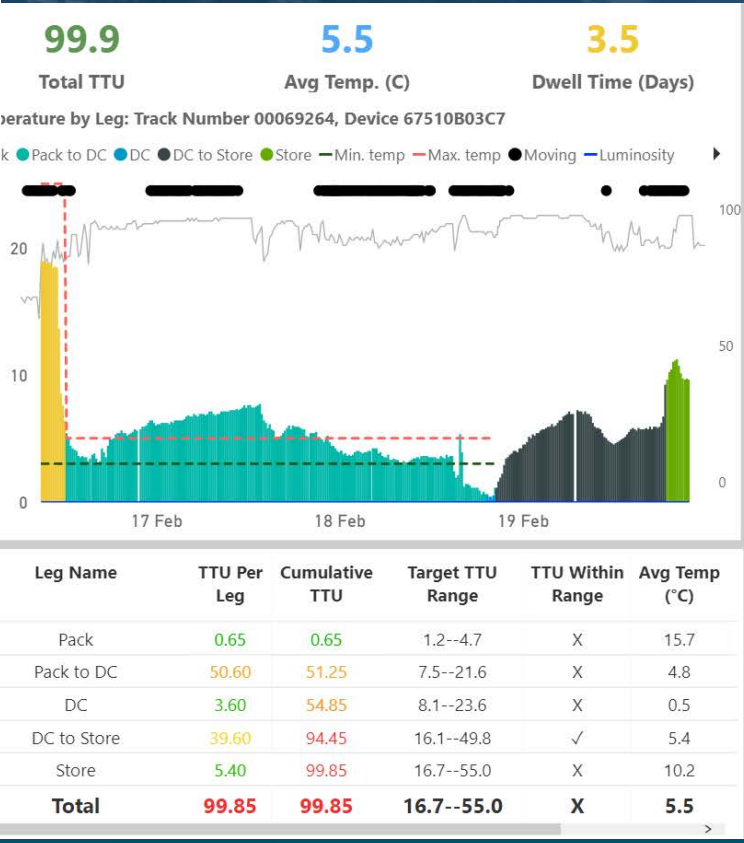
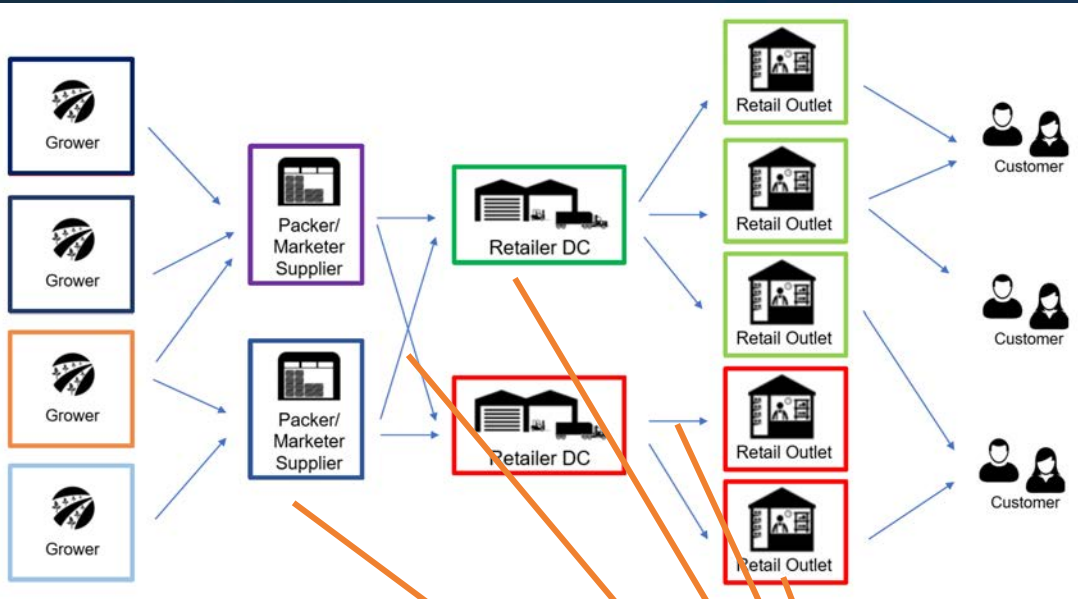
Company
ORBCOMM
Spireon
Schmitz Cargobull
Cooltrax
CalAmp
Idem Telematics
Samsara
Digi International
AddSecure
PowerFleet
G7 Networks
Transics (ZF)

Major Trailer Tracking Vendors

Company
DeltaTrak
Sensitech (Carrier)
Controlant
Escavox
Frigga (Dewav Electronic Technology)
Emerson
OnAsset Intelligence
Roambee
Adapt Ideations
Tempmate
Tive
7PSolutions
Intelyt

Major Cargo Tracking Vendors





Not just dots on maps – we need to move to intelligence

In Summary

What is the Cold Chain

A series of chains forming ecosystem of participants looking after product

Key Word : Chain

What is the Problem

Lost food, lost margin to participants, complex commercial and physical relationships

Key Word : Complexity

What do I do

Measure your chain, understand your role, understand the impact

Key Word : Measure

Why

Opportunities to remove waste, improve margins, create sustainable footprint

Key Word : Opportunity

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Giving fresh food a voice

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