

**AustChamThailand**  
Business | Connections | Community

# The Digital Supply Chain

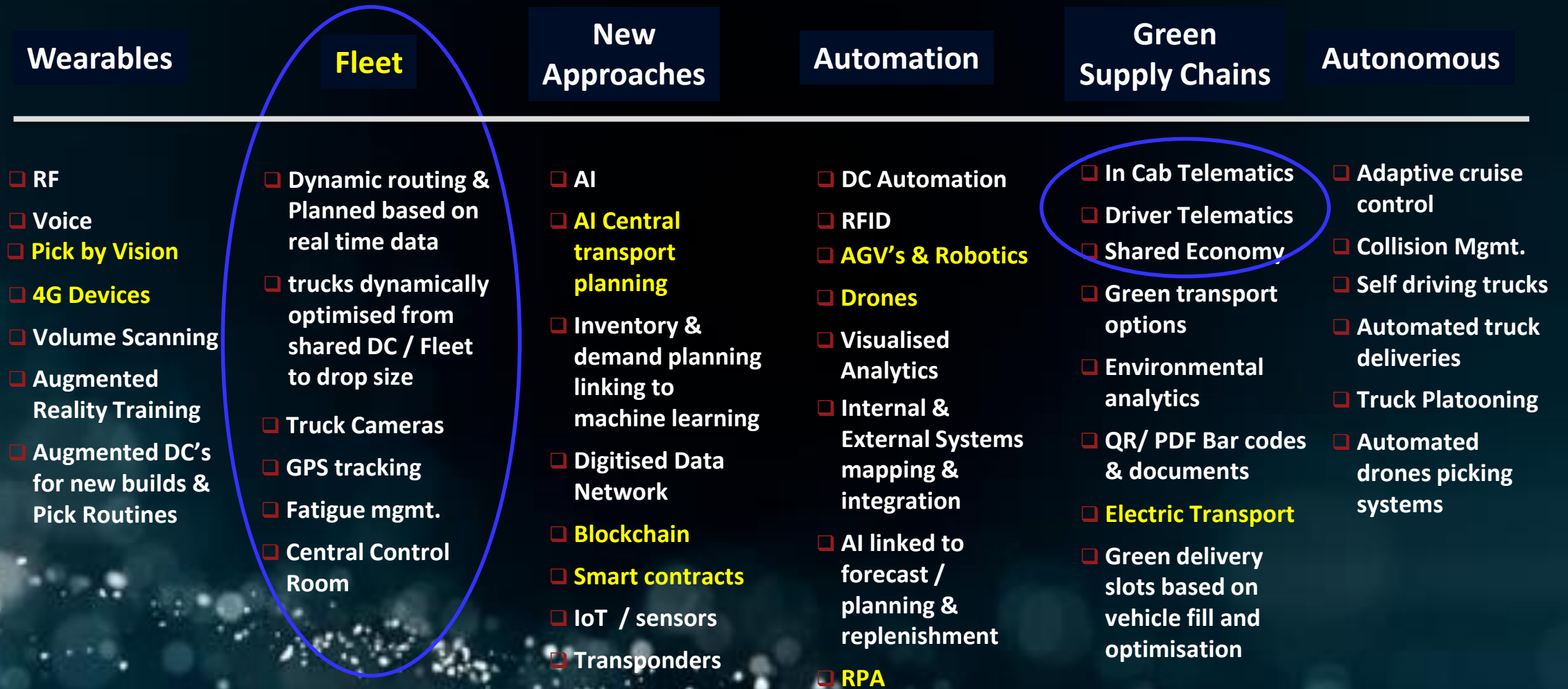




# Presentation Flow

- ❖ Overview of current concepts in the Supply Chain Industry
- ❖ Real world view of how some of these concepts are applied with the Fleet Sector
- ❖ Case Study on the Sharing Economy made possible through digitalization

# Digital Innovation & Transformation Sectors



2 Year Time Frame

# Linfox Fleet Solutions

Linfox platform is modular in approach and is capable of being deployed in to any size of operation or Geographical location, the core elements of this platform include:

- Dynamic Planning
- Dynamic Routing
- Driver & Vehicle Daily Safety Compliance / SOS Alerting
- Sub Contractor Management
- Track & Trace
- Track & Tracking Customer portal
- Sign on Glass
- VOIP
- Central Control Room
- Data is captured in our Azure Cloud
- Data analytics



# Dynamic Load Planning & Routing

## ❑ What is Dynamic Planning

- Typically initial planning is based on forecasts
  - When the orders are known and passed to the Warehouse Management System, the load planning can commence
  - This takes time to plan volumes to loads for customer routing
- 
- ✓ Taking data directly from the ERP or WMS in to planning systems
  - ✓ Allows us to switch from Static to a Dynamic
  - ✓ Daily loading planning optimized to available fleet

## ❑ What is Dynamic Routing

- Commonly most transport plans are static in nature
- They were based in a data point in time
- Defined routes and customer mix and vehicle routings
- Transport teams manually adjust which takes time & experience
- Sub-Contractor availability is also not know until the process is finished

❑ Sub contractor allocated loads can be done as a start of day

❑ Planned loads are integrated automatically in to the Foxtrax system and driver apps

❑ Benefits include: reduced planning time / optimized fleet and costs



# Routing and Load Optimization

## Order and Route Optimization

- Customer orders are fed into the system via integration and optimized for:
  - Fleet mix identified / Costs are known
  - Volume plan and fleet mix modelled
  - Route plans dynamically changed to meet that days needs
  - Service levels rules ensured
  - Route plans fed back to WMS

## Multi-factor Computation

- Multiple optimisation factors / constraints are considered
  - Warehouse Operating Hours,
  - Customer Window Times,
  - Heavy Vehicle Route / traffic congestion
  - Truck ban zones & timing
  - Bridge heights / road max loading / .side of the road
  - Receiving Bay Restrictions

## Benefits

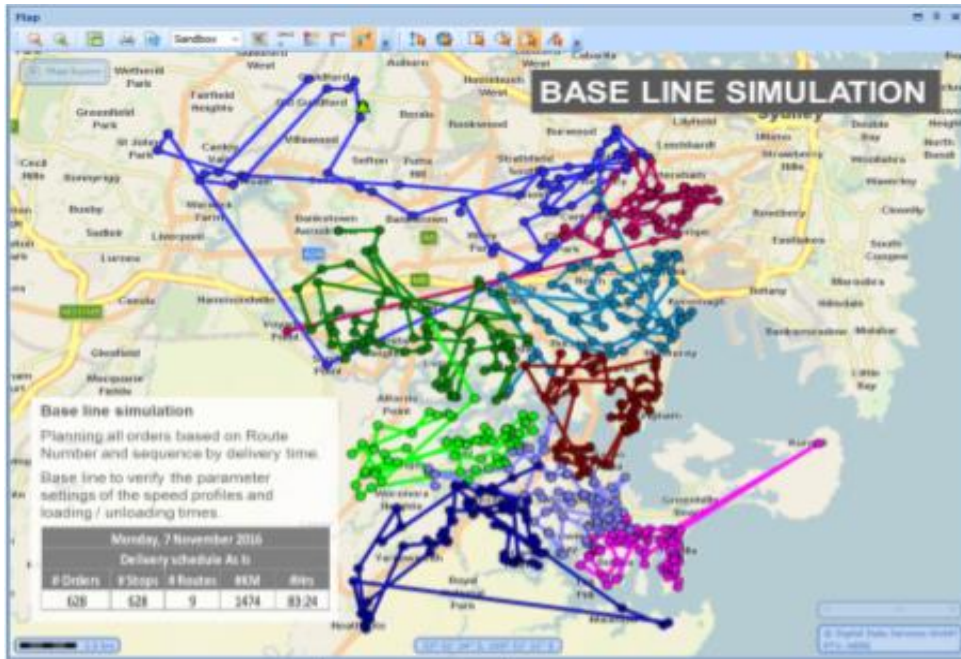
- Lower optimised costs of Fleet and Warehouse
  - Improved service levels
  - Digitally captured TMS data for billing
  - Lower cost outcomes
  - Warehouse efficiency
  - Reduced fuel / R&M = Improved environmental factors



| ID | Depot               | Distance  | Type     | Weight | Volume | Name of site       | Site street  | Start time | End time | Length     | Duration    | Costs | Driving time | Handing time | Break time | Rest p... |
|----|---------------------|-----------|----------|--------|--------|--------------------|--|------------|----------|------------|-------------|-------|--------------|--------------|------------|-----------|
| 1  | Electrolux North DC | 25.49 km  | Delivery | 232 kg | 0.348  | SIÊU TRƯỞNG BẾC    | TRƯỜNG AN ATOMES, SỰ GIẢI THƯỞNG TÊN, P. PHƯƠNG... | 08:00      | 15:00    | 13.12.0001 | 13.12.23:59 |       |              |              |            |           |
| 2  | Electrolux South DC | 26.49 km  | Delivery | 357 kg | 0.344  | BIG C TAY NINH     | LƯU TRƯỜNG CHINH P TAY THAM, QUẬN TÂY NINH...      | 08:00      | 15:00    | 13.12.0001 | 13.12.23:59 |       |              |              |            |           |
| 3  | Electrolux South DC | 11.81 km  | Delivery | 109 kg | 0.365  | CO.OPMART XTRA     | TT THỊNH GIANG TRỊ NHAM SỞ ĐỒ THE HOÀI NAM, TP...  | 08:00      | 15:00    | 13.12.0001 | 13.12.23:59 |       |              |              |            |           |
| 4  | Electrolux South DC | 21.07 km  | Delivery | 109 kg | 0.365  | CO.OPMART XTRA     | TRƯỜNG AN ATOMES, SỰ GIẢI THƯỞNG TÊN, P. PHƯƠNG... | 08:00      | 15:00    | 13.12.0001 | 13.12.23:59 |       |              |              |            |           |
| 5  | Electrolux South DC | 129.93 km | Delivery | 109 kg | 0.365  | CO.OPMART TAY NINH | SỞ CÁCH MẠNG THANG B, P3, THE XÁ TAY NINH...       | 08:00      | 15:00    | 13.12.0001 | 13.12.23:59 |       |              |              |            |           |
| 6  | Electrolux South DC | 126.14 km | Delivery | 109 kg | 0.365  | CO.OPMART DONG     | TRƯỜNG AN ATOMES, SỰ GIẢI THƯỞNG TÊN, P. PHƯƠNG... | 08:00      | 15:00    | 13.12.0001 | 14.12.23:59 |       |              |              |            |           |
| 7  | Electrolux South DC | 415.41 km | Delivery | 112 kg | 0.374  | BIG C NHAI TRANG   | LƯU TRƯỜNG CHINH P TAY THAM, QUẬN TÂY NINH...      | 08:00      | 15:00    | 13.12.0001 | 14.12.23:59 |       |              |              |            |           |
| 8  | Electrolux South DC | 24.00 km  | Delivery | 120 kg | 0.399  | BIG C CAU CO       | SỞ BBS DƯƠNG AÙ C, P. TAY THAM, QUẬN TÂY NINH...   | 08:00      | 15:00    | 13.12.0001 | 13.12.23:59 |       |              |              |            |           |
| 9  | Electrolux North DC | 14.57 km  | Delivery | 120 kg | 0.400  | BIG C LONG BINH    | TƯỜNG AN ATOMES, SỰ GIẢI THƯỞNG TÊN, P. PHƯƠNG...  | 08:00      | 15:00    | 13.12.0001 | 13.12.23:59 |       |              |              |            |           |
| 10 | Electrolux South DC | 49.23 km  | Delivery | 123 kg | 0.410  | BIG C BINH DUONG   | TRƯỜNG AN ATOMES, SỰ GIẢI THƯỞNG TÊN, P. PHƯƠNG... | 08:00      | 15:00    | 13.12.0001 | 13.12.23:59 |       |              |              |            |           |

# Dynamic Route Optimizer – Static Plans v Dynamic Planning

## Case Study

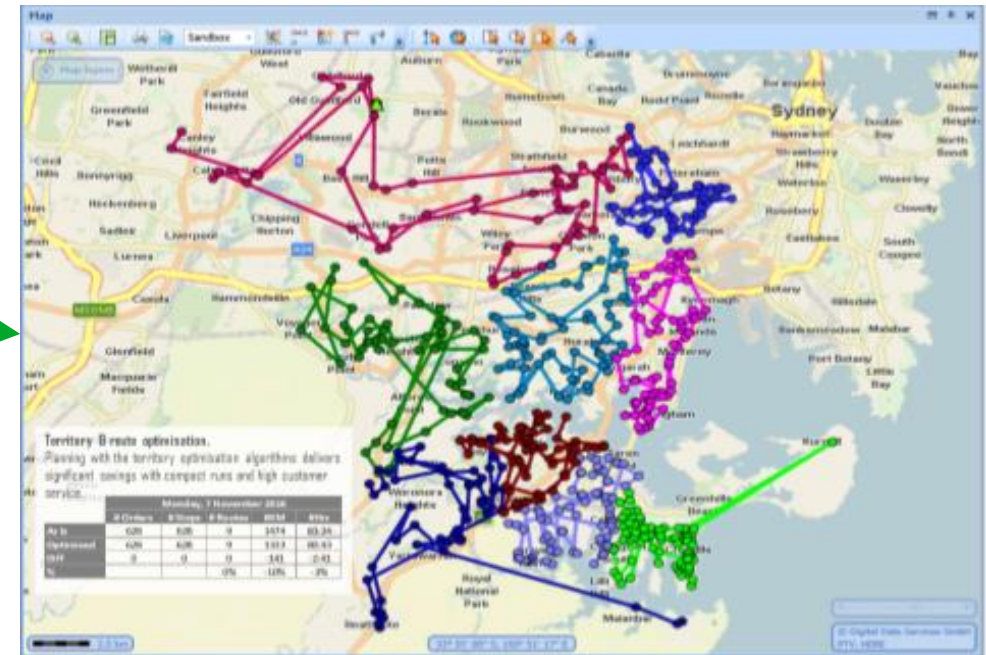


The Route Optimiser is used to analyse actual order data and existing route plan then compared the results by running through the system.

### RESULTS on the Daily Plan:

141KMs ↓ 2:41 Hrs Driving ↓ 10% reduction

↓ 60% Reduction in planning hours



Savings are not limited to the scheduling results, the scheduling process itself was reduced from several hours to merely minutes and provided:

- Increased efficiency
- Reduced costs
- Improved customer service
- TM back office savings and administration

# Planning Dashboard – Event Tracking

## Customer Service Desk

- Ability to access delivery information
- Information is presented based on milestones
- Each planned route is represented on a map
- Customer Operatives can address questions
  - Where is the delivery
  - Confirm planned ETA
  - Confirm if a delivery was made
  - Email POD's
- Removes admin from operations
- Can be used to drive the KPI reports

| Trip Code | Vehicle | Fleet    | Vehicle Class    | Status     | Start            | Finish |
|-----------|---------|----------|------------------|------------|------------------|--------|
| A0144221  | CH50YP  | BEVCHAIN | TAIL14PAL13.5TON | PODed      | 25/09/2018 07:26 | 12:15  |
| A0144222  | CH50YP  | BEVCHAIN | TAIL14PAL13.5TON | PODed      | 25/09/2018 12:46 | 17:33  |
| A0144917  | CH50YP  | BEVCHAIN | TAIL14PAL13.5TON | Allocated  | 26/09/2018 08:00 | 12:13  |
| A0144918  | CH50YP  | BEVCHAIN | TAIL14PAL13.5TON | Dispatched | 26/09/2018 13:36 | 18:44  |
| A0145501  | CH50YP  | BEVCHAIN | TAIL14PAL13.5TON | PODed      | 27/09/2018 06:03 | 10:45  |
| A0145984  | CH50YP  | BEVCHAIN | TAIL14PAL13.5TON | Dispatched | 28/09/2018 06:10 | 11:19  |
| A0145985  | CH50YP  | BEVCHAIN | TAIL14PAL13.5TON | PODed      | 28/09/2018 12:10 | 16:52  |

Page 1 of 1 | 20 items per page | 1 - 7 of 7 items

### Service Requests

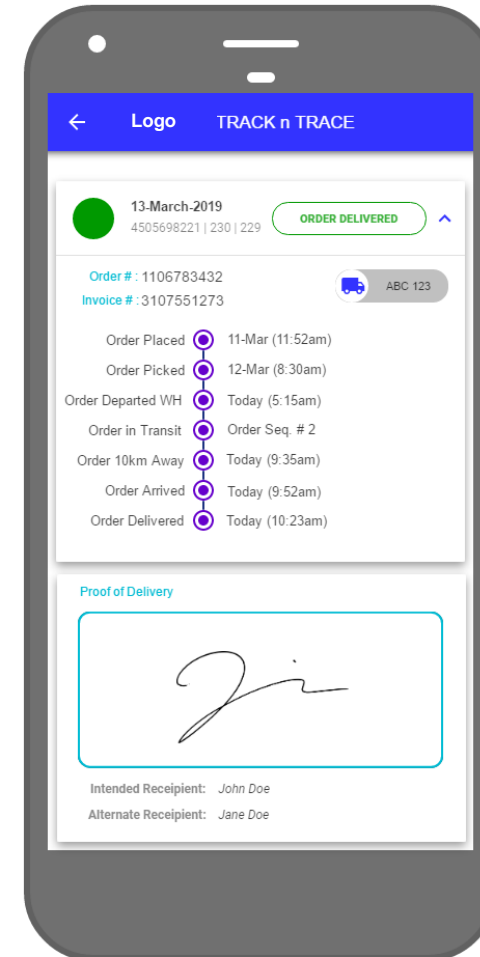
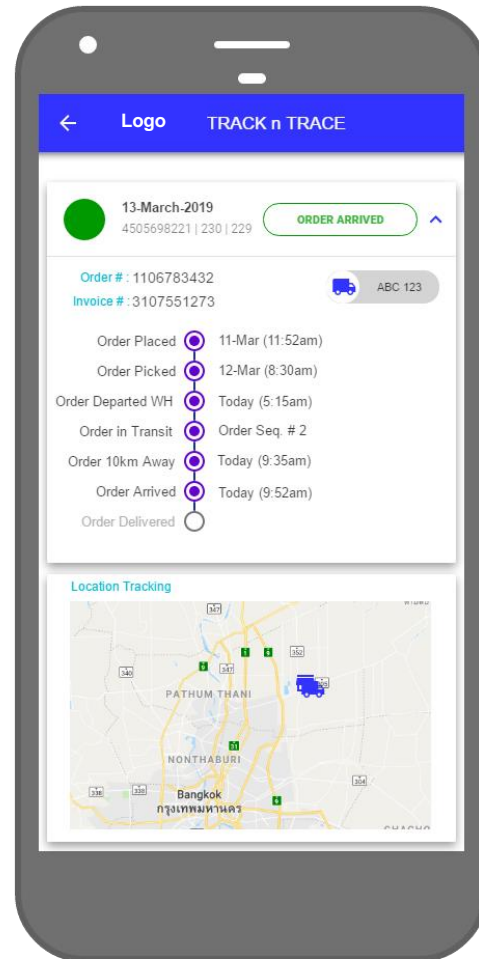
Loading between 24/09/2018 and 08/10/2018

Drag a column header and drop it here to group by that column

| Code      | Created On       | Order Number              | Physical Status | Geocode  | Trip Code |
|-----------|------------------|---------------------------|-----------------|----------|-----------|
| SR1266978 | 23/09/2018 14:51 | 10791AG5882671N0218092401 | Trip Created    | Geocoded | A0143714  |
| SR1267060 | 23/09/2018 14:33 | 10791AG588536TN0218092401 | Trip Created    | Geocoded | A0143710  |
| SR1264707 | 21/09/2018 08:41 | 10791AG583935CP0218092401 | PODed           | Geocoded | A0143594  |
| SR1265222 | 21/09/2018 12:15 | 10791AG587407TV0218092401 | Scheduled       | Geocoded |           |
| SR1266510 | 23/09/2018 10:12 | 10791AG588800TV0218092401 | Scheduled       | Geocoded |           |
| SR1266676 | 23/09/2018 11:37 | 10791AG583817TV0218092002 | Scheduled       | Geocoded |           |
| SR1264726 | 21/09/2018 09:03 | 29000CDSORD007062         | Trip Created    | Geocoded | A0143583  |
| SR1264724 | 21/09/2018 09:03 | 52400CDINV33511           | PODed           | Geocoded | A0143598  |
| SR1265530 | 21/09/2018 14:49 | 10791AG587623TN0318092401 | PODed           | Geocoded | A0143693  |



# Event Status Tracking – Customer Mobile App View



# Operational Dashboard Features

- Delivery Status Monitoring
- Management Dashboards
- POD Updates
- KPI Reports
- Finance / Billing
- Integration to customers ERP

### Safety

Month/Year: May 2018

| Categories | Current Month (May) | YTD (FY18) |
|------------|---------------------|------------|
| FAI        | 0                   | 0          |
| LTI        | 0                   | 0          |
| MTI        | 0                   | 0          |
| MVI        | 0                   | 8          |
| MVC        | 0                   | 0          |
| SB         | 0                   | 0          |
| VRI        | 0                   | 1          |

LINFOX - GIANT DC SEPANG SAFETY CROSS  
Our goal is zero injuries...

Thursday 10 May 2018 13 : 23 : 54

|          |          |             |
|----------|----------|-------------|
| LAST LTI | LAST MVI | LAST INJURY |
| 1,409    | 39       | 1,409       |

|             |               |
|-------------|---------------|
| INJURY FREE | INCIDENT FREE |
| 1,409       | 155           |

### Operations

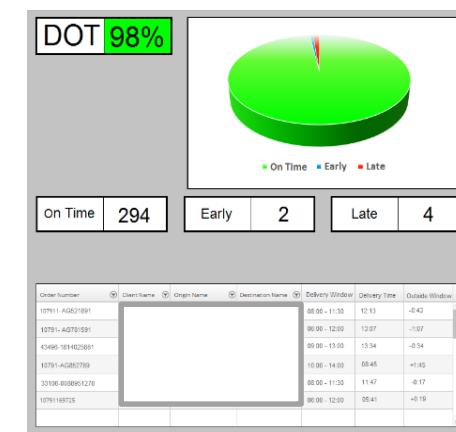
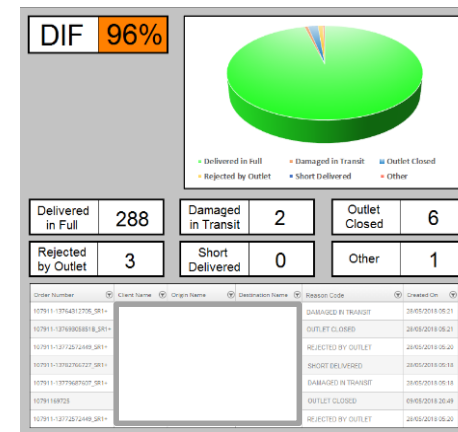
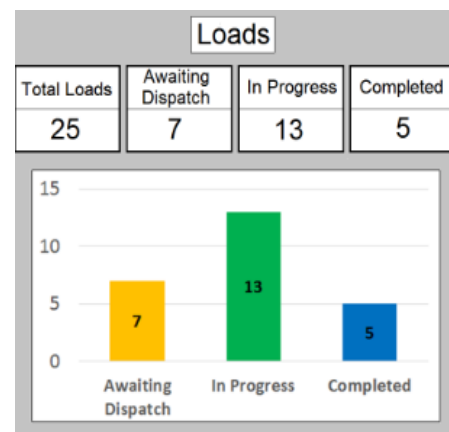
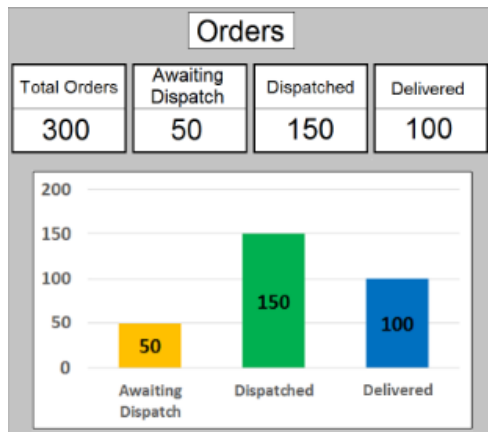
Organization: Giant Linfox - DC Sepang 10 May, 2018 Today

| GIANT LINFOX - DC SEPANG | LINFOX |        |        |        | SUBCON |        |        |        |
|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
|                          | 5T     | 10T    | 40FT   | TOTAL  | 5T     | 10T    | 40FT   | TOTAL  |
| CASES                    | 3,430  | 7,969  | 13,803 | 25,032 | 3,742  | 826    | 16,394 | 20,962 |
| PALLETS                  | 66     | 130    | 290    | 476    | 54     | 14     | 232    | 300    |
| TRIPS                    | 9      | 10     | 13     | 32     | 10     | 2      | 11     | 23     |
| STORES                   | 15     | 16     | 15     | 46     | 11     | 3      | 16     | 30     |
| UTILISATION              | 100%   | 81.25% | 92.95% | 90.49% | 81.82% | 56.00% | 91.70% | 87.21% |

|        |         |       |        |
|--------|---------|-------|--------|
| CASES  | PALLETS | TRIPS | STORES |
| 45,994 | 776     | 55    | 76     |

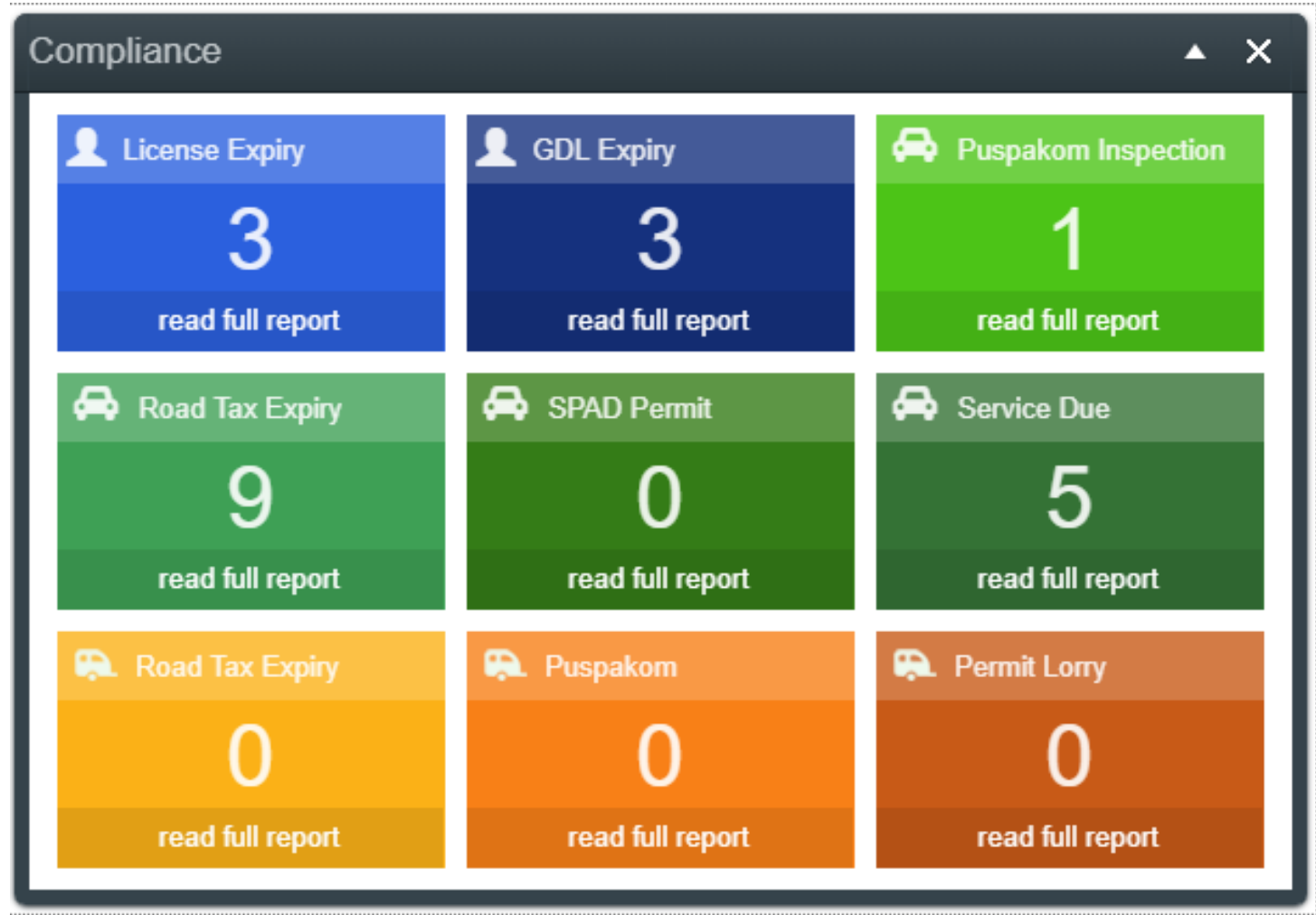
UTILISATION (%) 89.2

|                  |                  |
|------------------|------------------|
| CASES PER PALLET | PALLETS PER TRIP |
| 59.27            | 14.1             |



# Compliance Dashboard Features

- Driver's License Validity Compliance
- Vehicle Permit Validity Compliance
- Review of Work and Rest Hours
- Review of Driver Safety Declaration Records
- Review of Pre-Departure Safety Check Records
- Timesheet recording
- Data can be linked in to a Transport Management System for billing





**vision  
ZERO**

# LINFOX OPERATIONS CENTRE

As of May 2019



# About Operations Centre

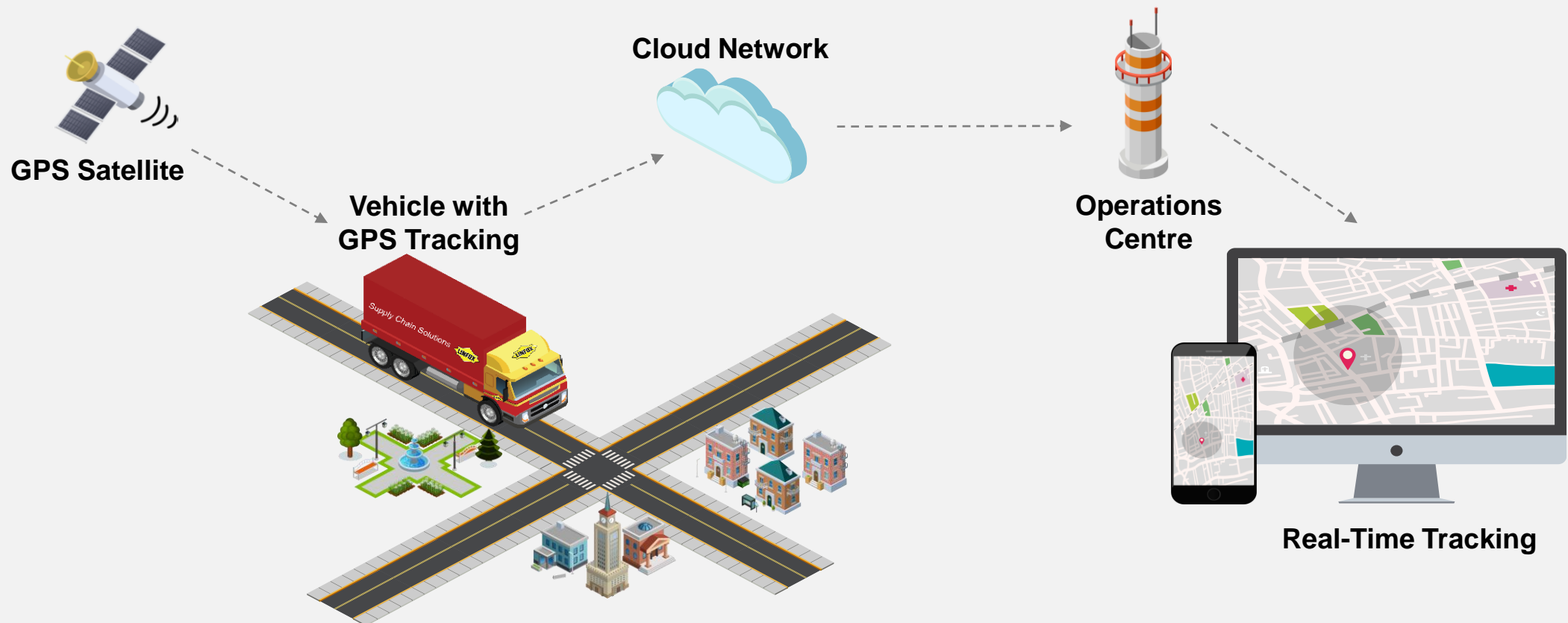


## Customers we serve



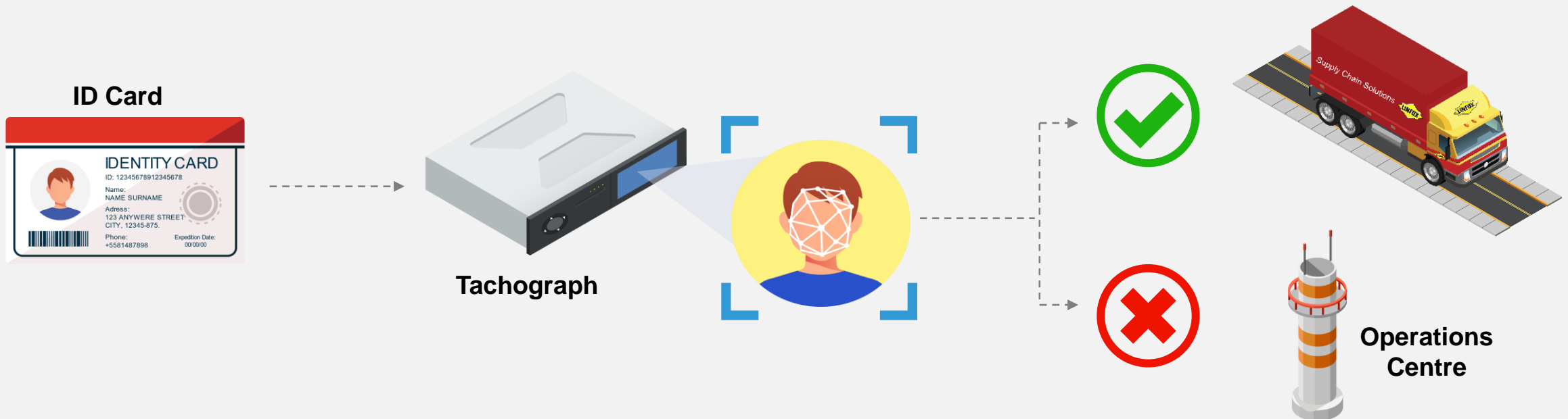
# GPS Vehicle and Asset Tracking

- An intelligent fleet management solution allows Linfox team to track and monitor all vehicles via in-built GPS trackers.
- The technology enables monitoring of driver location and behavior, mileage, fuel consumption, temperature, prohibited stop areas and vehicle movements.
- This capability is extended to cross border operations encompassing the fleet across countries.



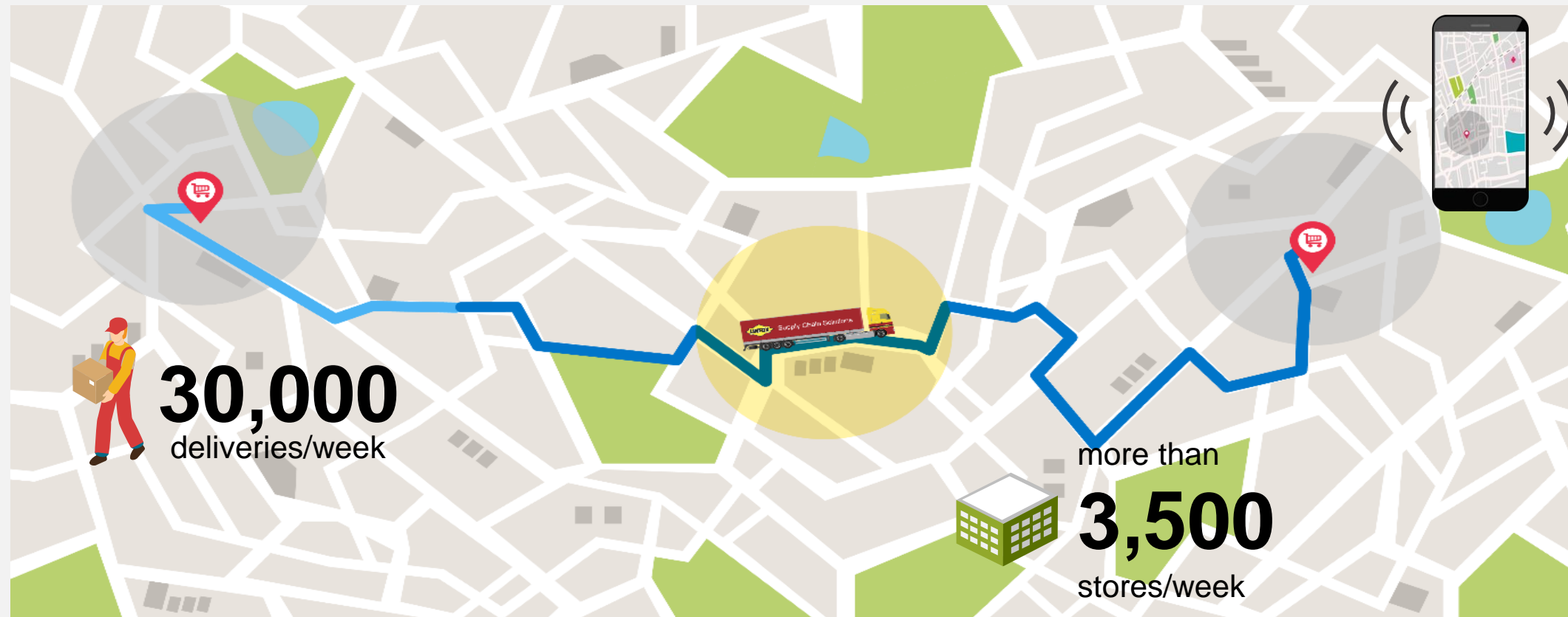
# Automatically Driver Identification

- All Linfox vehicles are equipped with swipe card tachographs, which requires drivers to insert their driver licenses in the tachographs before each trip.
- If drivers do not identify themselves via this method prior to starting a trip, controls are in place to ensure the vehicle is not engaged which safeguards Linfox and customer assets.



# Geofencing

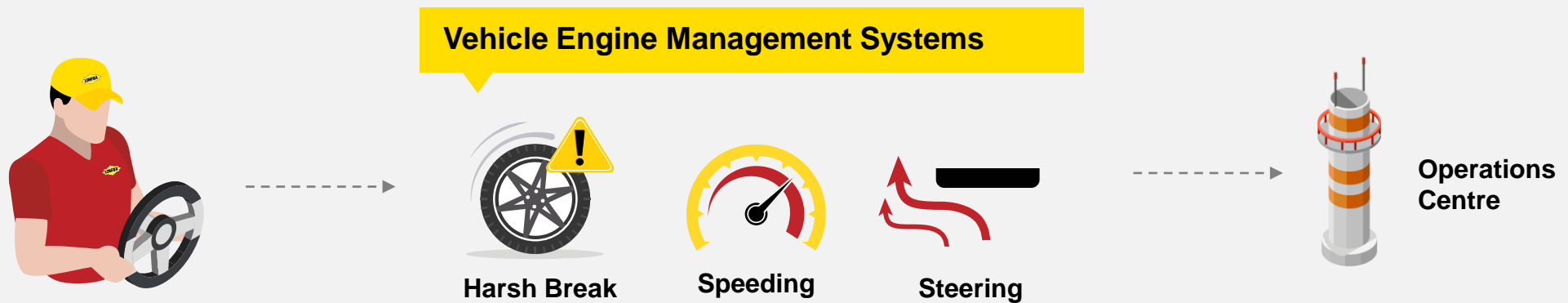
- Geofencing is applied to all customers' stores, distribution centres and service stations, enabling our team and customers to receive automatic notifications regarding vehicle arrival and departure times from job sites.
- The geofencing technology measures more than 30,000 deliveries per week and more than 3,500 stores per day.





# Driver Behaviour

- Aggressive driving increases fuel consumption, gas emissions, vehicle wear and maintenance requirements and risks of road safety incidents.
- Through vehicle engine management systems, drivers are measured on their ability to drive economically, with instances of harsh acceleration, breaking and steering monitored and detected.
- The operations centre is immediately alerted in the event of any erratic driving and speeding being detected and information on excessive idle time and asset movements are also recorded.



- Benefits: Reduce fuel usage / R&M on the vehicle and accidents
- Education: Drivers are regularly monitored and provided education on these factors

# Fuel Management

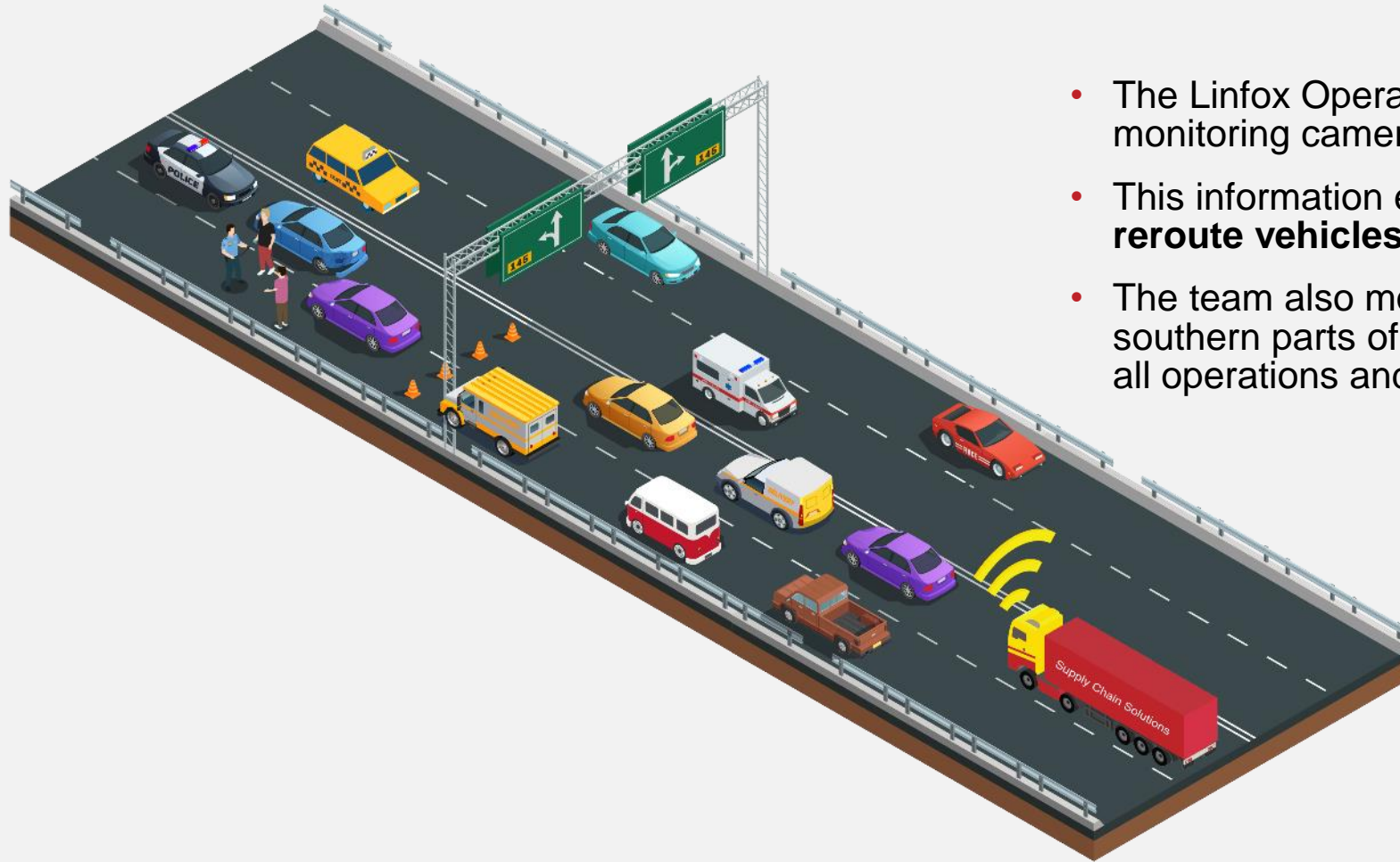


**25**  
million litres  
of fuel usage  
per year

**1**  
million  
kilometres of  
travel monitored  
daily

- We monitor an average of 25 million litres of fuel usage per year, and almost one million kilometres of travel monitored daily through the vehicle engine management systems.
- The technology enables **abnormal fluctuations** in fuel usage to be quickly identified and dealt with.

# Traffic and weather monitoring and forecasting

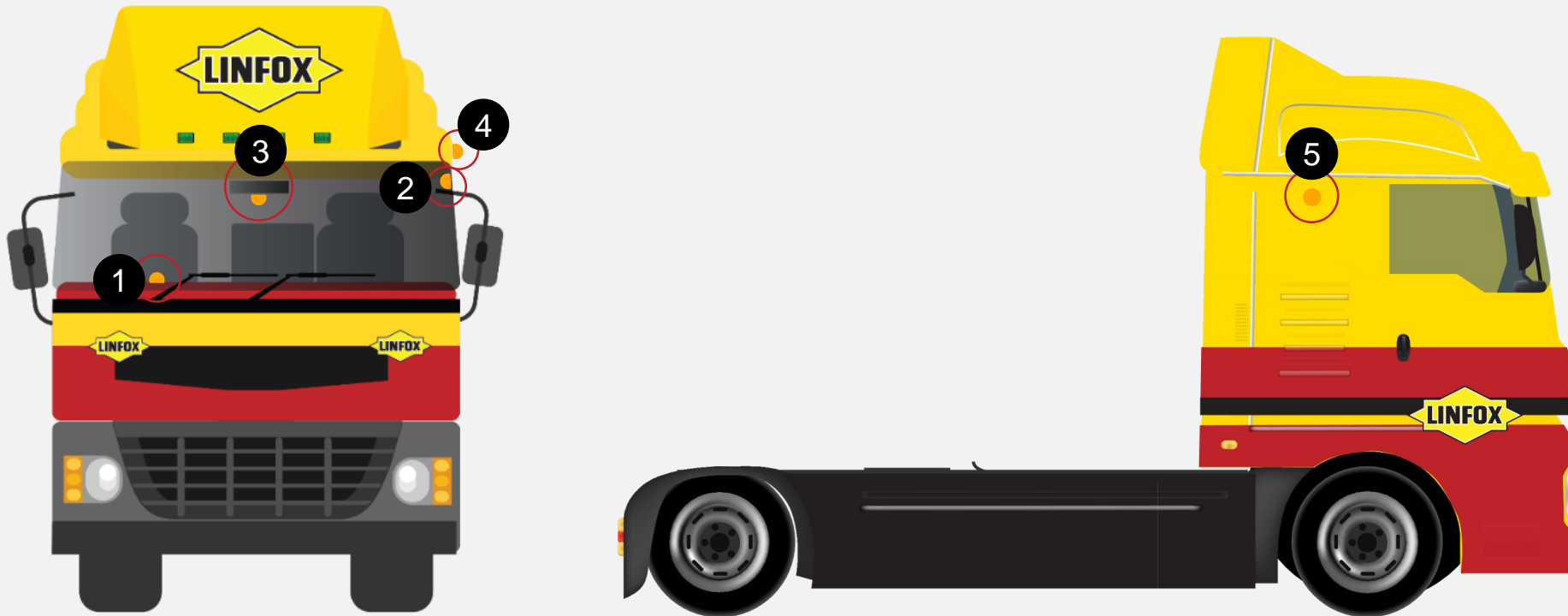


- The Linfox Operations Centre team has direct access to traffic monitoring cameras located on major highways across Thailand.
- This information enables the team to identify **traffic conditions and reroute vehicles** where required.
- The team also monitors adverse weather, **political instability** in the southern parts of the Kingdom and generates two hourly reports for all operations and customers.

- Benefits: Linked to Dynamic routing systems we can re-route trucks ensure safe or timely deliveries

# Fleet Surveillance

- Vehicles in the Linfox fleets are equipped with 5 cameras, including (1) a driver facing camera, (2) in-cab camera, (3) road facing camera, (4) side fleet camera and 5) rear camera.



- Benefits: Health & Safety education / Critical in Driver Fatigue Management

# Fatigue Management

- Strict fatigue management compliance is executed through the operations centre.



Every  
**4 hours**  
continuous driving



Rest breaks

Drivers are monitored to ensure rest breaks occur prior to 4 hours of continuous driving, mandatory 30-minute rest breaks are adhered to



Rest breaks before next shift

Minimum 10-hour breaks are achieved prior to the commencement of the next shift.

- Benefits: Linked to GPS systems we can route trucks to safe stop zones

# Fatigue Management

- The driver facing camera monitors driver's eyes for fatigue measurement and distractions.
- The system can detect driver fatigue and drowsiness by measuring and monitoring eye blink pattern, road distractions, eye closure, mobile phone usage, yawning and head pose.
- The system sounds an alarm alerting the driver and operation centre team where signs of fatigue are detected.
- The driver's seat will also vibrate at the same an audible in-cab alarm is sounded.



## Sign of driver fatigue and distraction

- eye blink pattern
- road distractions
- eye closure
- mobile phone usage
- yawning
- head pose

## When System Detect



*Case Study*  
*The Sharing Economy*



March 2019

# Shared Economy – Warehousing & Fleets

## Linfox Thailand Network

- 20+ DC's
- 600+ Vehicles 150+ Trailing fleet (Linfox Owned)
- 500+ with full GPS tracking suite & fatigue Mgmt. systems
- 1.5m+ stores deliveries annually
- Multi Temperature Fleet & DC's
- 8,900+ Team Members

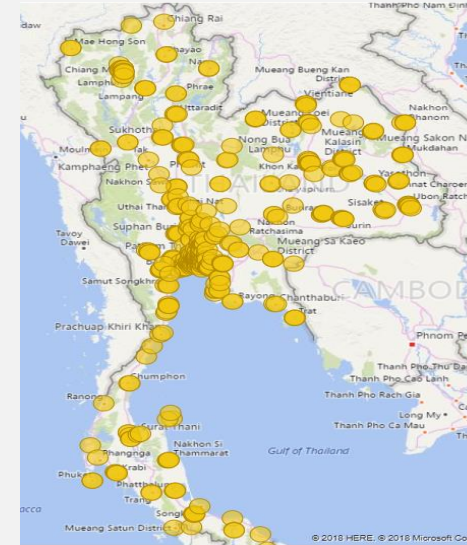
## Bevchain

- 16 Distribution Warehouses
- 800+ Vehicles a week
- 4000+ stores deliveries a week

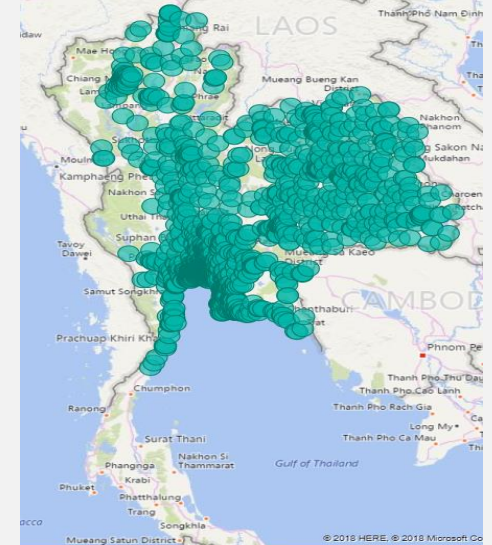
## Real Opportunity to Share Capability Between Customers

- Shared spare capacity within DC's
- Shared spare capacity across many complimentary fleets
- Aim is to drive out Supply Chain costs whilst maximizing service levels with complementary partners

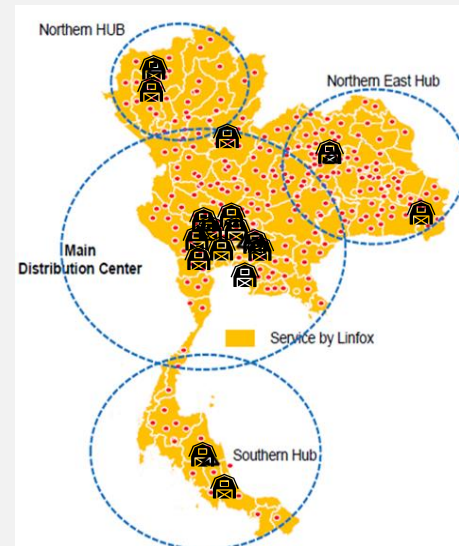
Bevchain Delivery Points



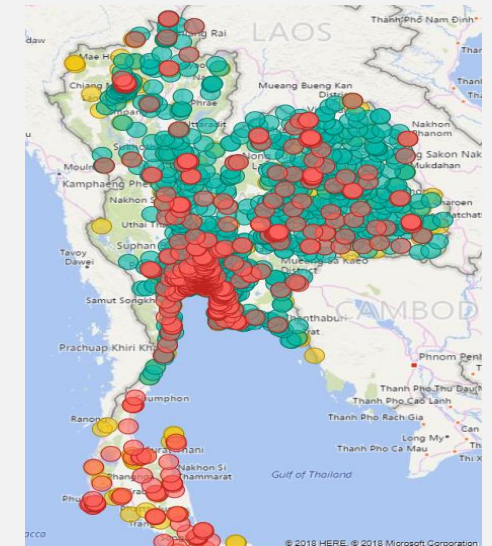
Retail Delivery Points



Combined DC Locations



FMCG Delivery points

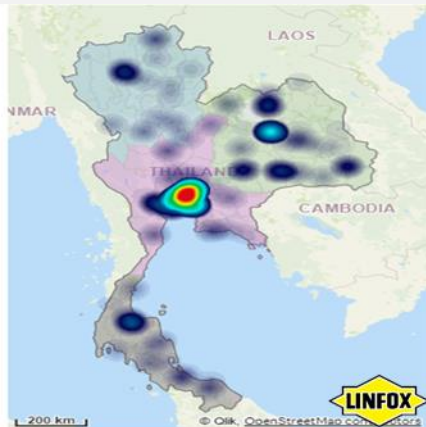
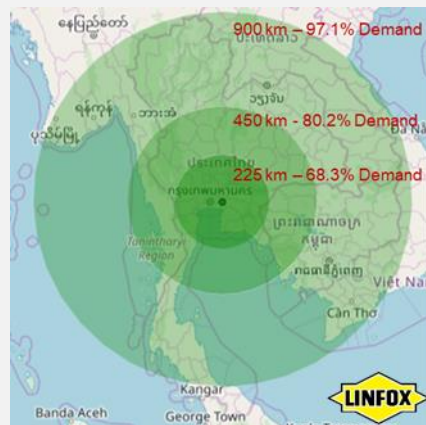
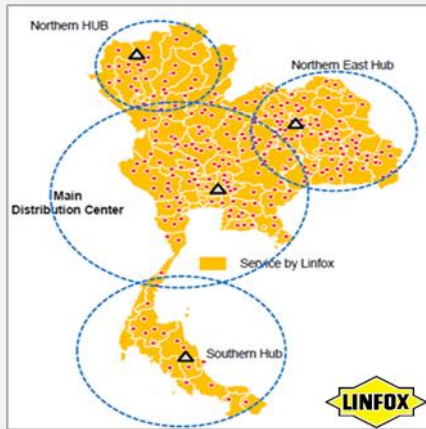




# Case Study - Delivering a Shared Network

## Leverage Linfox economies of scale in Thailand across multiple parties in Transport and Warehousing

- Deliver a shared economy network that places our customer closer to its customers whilst driving down the cost to serve
- Break down trading barriers and work in open collaboration with a number of complimentary FMCG or Retail companies to improve service & costs together.



### Challenge

- Optimize overall cost of distribution
- Improve service levels to the customer
- Identify network future capacity
- Leveraging Linfox's existing DC network to enable a shared RDC's infrastructure
- Shared Fleet network opportunities across the existing Linfox network in Thailand
- Digitally provide real time operational info as well as fleet track & trace solution through to customers visibility

### Solution

- Instigated a joint working party with the customer and Linfox
- Defined the challenges for Network modelling & their optimal network overlaid on top of Linfox's Thailand network
- Challenge DC setups
- Define and size and a shared DC network leveraging Linfox's complimentary FMCG & Retail customers
- Re-engineer the optimize transport fleet and mix between Primary & Secondary fleets
- Shared fleets with collaboration partners

### Results

- Defined optimized shared DC network with collaboration partners
- Improved customer service levels to an avg. of 6 hours from a range of 6 to 31 hours
- Defined optimized Primary fleet network to reduce cost ready to be further leverage though shared fleet collaboration
- Redefined the Secondary fleet in collaboration
- Delivered real time dashboards
- Delivered Fleet track & trace systems with customer provided with visibility in real time



BE PART OF

**LIFT**

Loyalty ▪ Integrity ▪ Fairness ▪ Trust

THE BIGGER PICTURE



### Loyalty

We're about people and relationships. If we don't look after one another, we can't win. Together we find solutions and we don't take our relationships for granted.



### Integrity

We do the right thing. Always. We're transparent, honest and ethical in our interactions with our colleagues, customers, suppliers and the public. In short, we're true to our word.



### Fairness

We're all equal and we treat each other with respect. We are one team working towards a common goal. We get the best results when we cooperate and uphold our mutual responsibilities.



### Trust

We trust in each other to deliver. We trust in the good intentions of each other and we're rewarded for that. We accept that trust must be earned and can't be taken for granted.