In- & Outbound Auto Logistics - Current & Future State

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Geoff Williams
Outline

• Inbound
  – Different levels of integration
  – Key performance indicators
• Inbound Logistics in 3DayCar Scenario
  – What are the key constraints?
• Outbound
  – Key performance indicators
• Outbound Logistics in 3DayCar Scenario
  – What is the cost of 24-hour delivery?
Auto Inbound Logistics

Collection Frequency, Inventory, Load Efficiency

RDC

Supplier

Overseas Parts

Load Efficiency, Frequency

Plant

How long does the system need to respond to change?
## Inbound Key Performance Indicators I

<table>
<thead>
<tr>
<th></th>
<th>Non-Integrated</th>
<th>Semi-Integrated</th>
<th>Fully Integrated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Call off Notice given</strong></td>
<td>5pm, day before pick-up</td>
<td>2 weeks</td>
<td>Hours, On-line</td>
</tr>
<tr>
<td><strong>Response Lead Time Call-offs</strong></td>
<td>1 day</td>
<td>2 weeks</td>
<td>&lt; 1 day</td>
</tr>
<tr>
<td><strong>Response Lead Time - Framework</strong></td>
<td>1 day?</td>
<td>2 weeks</td>
<td>1 month</td>
</tr>
<tr>
<td><strong>Trailer-Truck Ratio</strong></td>
<td>3:1</td>
<td>2:1</td>
<td>2:1</td>
</tr>
<tr>
<td><strong>Delivery Lead Time Call-off - Plant</strong></td>
<td>36 hours</td>
<td>12-18 hours av. 24 hours max</td>
<td>16 hours, 0.7 days stock (incl. WIP)</td>
</tr>
</tbody>
</table>
## Inbound Key Performance Indicators II

<table>
<thead>
<tr>
<th></th>
<th>Non-Integrated</th>
<th>Semi-Integrated</th>
<th>Fully Integrated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Load Efficiency (Trunking)</strong></td>
<td>85% cubic</td>
<td>85% floorspace 68% cubic</td>
<td>80-85% cubic</td>
</tr>
<tr>
<td><strong>Cardboard Content</strong></td>
<td>50%</td>
<td>25%, plus 5% due to lack of empty stillages</td>
<td>N/a (est. 10%)</td>
</tr>
<tr>
<td><strong>No of Container Sizes Std / Non-Std</strong></td>
<td>277 containers, 10% standard</td>
<td>N/a</td>
<td>120 containers, 60% standard</td>
</tr>
</tbody>
</table>
Inbound Logistics Process - Example

Week 1
Mon: Release of orders
Tue: Route Generation
Fri: Pick-up Sheets are received at vendors & carriers

Week 2
Mon: UK Start Collection
Fri: PUS received at depots, some via courier

Week 3
Mon: Delivery to Plant
Fri: Consolidation in Europe

Pick-up Sheets are received at vendors & carriers
Start split into delivery routes for W3
Feedback to Plant to achieve load efficiency.

UK: Collection Generally day before delivery
Start Delivery to Plants
Last Deliveries to Plants

...Change Lead Time: 2 weeks!
Integrated Logistics - Example

LINEHAUL ROUTE
PARTS DELIVERIES

COLLECTION ROUTE
SUPPLIERS

VM

CROSSDOCK

ASN

RAN's

COLLECTION DETAILS
APPLIED TO
SCANNING
EQUIPMENT

VARIANCES
COMMUNICATED
TO CONTROLLER

SCAN PRODUCT
AT THE POINT
OF COLLECTION

Host
Integrated Logistics - Inventory in the Pipeline

Progress to Date

Financial Benefits

Total Quality Benefit

Days

Actual

Optimum Inventory Scenario

Stock Levels (Hrs)

Safety Stock at Timeslot

Deliveries from Partner

Note:- Figures shown also include work in progress (W.I.P.)
Problems in Current State

- **Information reliability:**
  - Short term changes occur due to:
    - Call-off change by VM
    - Lack of empty stillages

- **Packaging and containers**
  - Lack of standardisation, loss of efficiency (stacking)
  - High cardboard content

- **Supplier opening times**
  - 60-70% shut on Friday afternoon

- **Inflexible delivery windows at the plant**

- **Competition with VM fleets, impact on efficiency**
3DayCar Requirements I

24 hour Delivery and Pick-up

• Flexible delivery slots
• Electronic signature
• Secure drop & pick location at supplier
• Reduce cost through multi-franchise or cross-sector consolidation
Overlap of UK Suppliers

VM C

VM B

VM A

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3DayCar Requirements II

Real-time Visibility

- Integration of route-planning and supply constraints into VM scheduling system
- **Dynamic processing** (not over-night!)
- Transponder technology
3DayCar Requirements III

Modular Load-Building Ability

- Standardised containers
  - Minimum individual containers and cardboard
- Centrally controlled stillage return process
- Transponder technology
Outbound Logistics - The Current State
Auto Outbound Logistics

Visibility & Load Building

Local Dealer

DC / Compound

Import/Export

Dealer

Load & Backload Efficiency
## Outbound Key Performance Indicators

<table>
<thead>
<tr>
<th></th>
<th>Outbound A</th>
<th>Outbound B</th>
<th>Outbound C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Load Consolidation in Plant</strong></td>
<td></td>
<td>0.9 days on average</td>
<td></td>
</tr>
<tr>
<td><strong>Factory-Compound Actual Delivery Time</strong></td>
<td>5 min</td>
<td>1-12 hours</td>
<td>N/a</td>
</tr>
<tr>
<td><strong>Compound-Dealer Contracted Delivery Time [days]</strong></td>
<td>2.75</td>
<td>2.75</td>
<td>2.67</td>
</tr>
<tr>
<td><strong>Compound-Dealer Actual Delivery Time [days]</strong></td>
<td>1.94</td>
<td>2.4</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>% outside contracted Delivery Time</strong></td>
<td>8.5%</td>
<td>3.6%</td>
<td>1.5%</td>
</tr>
<tr>
<td><strong>Dealer Drops</strong></td>
<td>2.63</td>
<td>3.5</td>
<td>3</td>
</tr>
<tr>
<td><strong>Damage Level</strong></td>
<td>0.6%</td>
<td>0.4%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>
### Data Exchange VM - Logistics

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<th>Outbound A</th>
<th>Outbound B</th>
<th>Outbound C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Volume</strong></td>
<td>Monthly Weekly</td>
<td>Monthly Weekly</td>
<td>Weekly</td>
</tr>
<tr>
<td><strong>Volume per Model / Body</strong></td>
<td>Monthly Weekly</td>
<td>Daily</td>
<td>Weekly</td>
</tr>
<tr>
<td><strong>Volume by Market</strong></td>
<td>Monthly</td>
<td>Monthly</td>
<td>Weekly</td>
</tr>
<tr>
<td><strong>Market by Region</strong></td>
<td>Monthly</td>
<td>Daily</td>
<td>Weekly</td>
</tr>
<tr>
<td><strong>Feedback Given</strong></td>
<td>Delivery Vehicle Status</td>
<td>Volume Delivery Vehicle Status</td>
<td>Volume Delivery Vehicle Status</td>
</tr>
</tbody>
</table>

- Insufficient Planning Data
Example: 2 UK Plants

Forecast v Actual Volumes

- Plant 1 - F/C
- Plant 1 - Actual
- Plant 2 - F/C
- Plant 2 - Actual


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Forecast Error range from +60% to -100%

Forecast Error in %

- Plant 1 - Variability
- Plant 2 - Variability
Main Issues

• Unreliable forecast and schedule information
  – No collaborative planning other than load-building
  – No input into production scheduling
• Only one contracted time, regardless of order & volume
• Backloading required (average 60%)
  – ...but no formal process
  – Contributes to 3 days load building time
• ‘Panic shipping’ - Overstocking or express to port
• Dealer Opening times
  – Dealers can’t always take allocated stock
The Future State of Outbound Logistics
Problem

How to deliver vehicles

• In 1 day within the UK
• At the same cost as the current 3 - 4 day situation
• Without significant environmental impact.
Assumptions

- 2.0 million UK sales per annum
- + 0.5 million road-trunked exports
- Excludes current rail trunking
- Based on 11 car transporters
- No increase in volume fluctuations
- Reactive scheduling
- Loss of efficiency in back loading
### Cost and distance situation

<table>
<thead>
<tr>
<th></th>
<th>Cost p.a.</th>
<th>Truck Distance p.a.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>£150 million</td>
<td>125 million kilometres</td>
</tr>
<tr>
<td>3DayCar with current methods</td>
<td>£200 million</td>
<td>160 million</td>
</tr>
<tr>
<td>Increase</td>
<td>33%</td>
<td>29%</td>
</tr>
</tbody>
</table>

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Cost situation

• Current Cost: c. £60 per vehicle

0.6% of retail price of vehicle

• Excess cost of transport of 3DayCar is £20

+ 0.2 % of vehicle price
Solutions

• Co-operation between manufacturers and logistics companies
  – Multi Franchise
  – Backloading

• Mix of smaller transporters

• Planned Logistics
Multi - Franchise History

- 1960’s: Totally single franchise
  Transporters identified by franchise
  Very little backloading opportunity

- 1980’s: Transporters identified by Logistics Company Multi-franchise in remote areas.
i.e. North of Scotland.
Multi - Franchise History

• 1990’s : Example of multi-franchise from one port
  Logistics company co-operation to maximise backloading opportunity (now c. 60 %)

• 2000’s : Big PR opportunity for manufacturers to work together to increase cost and distance efficiency of transportation

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Multi - Franchise
From Port
Multi - Franchise
From Factories

Direct delivery quicker and cheaper near to factory
Multi - Franchise
Problem of Dogleg
Multi - Franchise
Regional Compounds

More work required

Multi - Franchise

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Backloading
Cost Savings per unit: Co-operation

- Excess 3 DayCar cost: £20
- Multi-Franchise *: >£3
- Backloading: £5
- Total Savings: >£8

Additional Savings required: <£12

*More work required on compounds
Mix of Lower Capacity Transporters

- Cost saving - £9 per unit

but

- Further kilometre increase of 9%

compensated by ?:
  - Axle weight
  - Fuel consumption
  - Emissions
  - Physical size
Cost Savings

- Excess 3 DayCar cost: £20
- Co-operation: >£8
- Mix of transporter size: £9

BUT Combined saving only: £14

More co-operation =
Less need to use smaller transporters

Additional Savings required: £6
Planned Logistics

- Immediate visibility of 3DayCar orders in hourly production schedule
- Production sequencing to assist scheduling of long distance zone
- Reliable production
- Optimised hourly delivery planning
Planned Logistics
Open to All Parties: Current

WHERE’S THIS CAR ???

LOGISTICS COMPANY

MANUFACTURER

COMPONENT SUPPLIER

DEALER

SORRY, SIR

RED CARS TODAY

ZZZZZZ ...

3DAY car

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Planned Logistics
Open to All Parties - Future

IT’S JUST BEEN PAINTED

I WILL HAVE IT IN TWO DAYS

IT WILL BE HERE IN THREE DAYS, SIR

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Feasible Solution

- Consolidation of imports at 4-5 UK ports
- Consolidation of selective regional zones to factories/compounds
- Optimum backloading
- Smaller mixed fleet of transporters
- Planned Logistics
Cost Savings

- Excess 3 DayCar cost £20
- Co-operation >£8
- Mix of transporter size £9
- Planned Logistics £4

Combined saving £21
Savings £1

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Solution Effects

Transportation Cost Saving £1
Deletion of Distribution Centre £20

Minimum Saving Potential £21

• Kilometre increase of 14% on current
Cost and Environment conflict: Example

Low cost versus best environmental option

Number of kms per car

Current
Low cost 3DC
Low km 3DC

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Impact on Fuel less than Kilometres - Regional Example

**Difference in Kilometre and Fuel Impacts**

- **110%**
  - **S Scot**
  - **Yorks**
  - **N East**

**Percentage Increase**

- **105%**
- **100%**

**Regions**

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Other Areas of Efficiency Gain

- Variable delivery periods on different customer segments: 1 day - 3DayCar
  3 day - Demonstrator
- One delivery date throughout supply chain
- End of life vehicle recycle
- 24 hour delivery to dealer

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24 Hour Delivery to Dealer
24 Hour Delivery to Dealer Problems

- Local authority restrictions on access to dealer
- Requirement for dealer availability to inspect on receipt of vehicle
- Security of vehicle on overnight delivery
24 Hour Delivery to Dealer Solution

- Only insure and inspect for major damage within 24 hours
- Joint allowance in warranty per vehicle to cover minor damage and “factory quality”
- Split allowance between Logistics and Service on basis of periodic sampling
- Secure delivery compound at dealers for overnight delivery
24 Hour Delivery to Dealer
Advantages

- Reduces congestion
- Reduces lead time
  or
- Improves capacity utilisation
- Potential savings on insurance and inspection
Conclusions

- 3Daycar feasible with no increase in cost BUT depends on co-operation between parties
- Good PR for manufacturers to operate on multi-franchise basis with logistics comps.
- Further research work required

What about direct delivery to customer?
Thank you for your attention!