The
Road Traffic Management System (RTMS) in the sugarcane industry
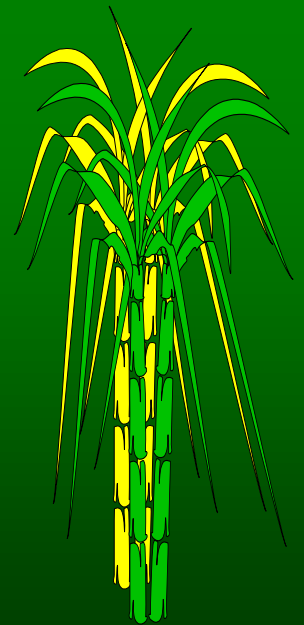
Agbiz Grain

12 August 2015

Peter Lyne

Contents

- Self-regulation
- Sugarcane overload strategy
- Payload analysis
- Payload management
- RTMS
  - PBS / Smart Truck

There are good reasons to self-regulate

- Poor vehicle management results in;
  - Increased costs
    - » Accidents
    - » Road damage
    - » Operating costs

- Legislation
  - Consignor / consignee
  - AARTO

- Overloads / Under loads

Sugarcane overload strategy
2007

- KZN DOT, SACGA and industry cooperated to run an overload strategy

- Crickmay appointed service providers

- Monitor payloads
  - Have a system to encourage accurate loading

Sugar "RTMS" programme

2007 Load strategy

- Each mill area would take responsibility for a loading strategy

- There would be regular report backs to monitor progress

Sugarcane transport fleet

- 440 hauliers
  - 1367 vehicles
  - 15.8 Mt sugarcane

- Legal payload had to be determined for each vehicle

Sugarcane transport fleet

Distribution of Combination Type

Truck Tractor, Interlink Trailers
30%

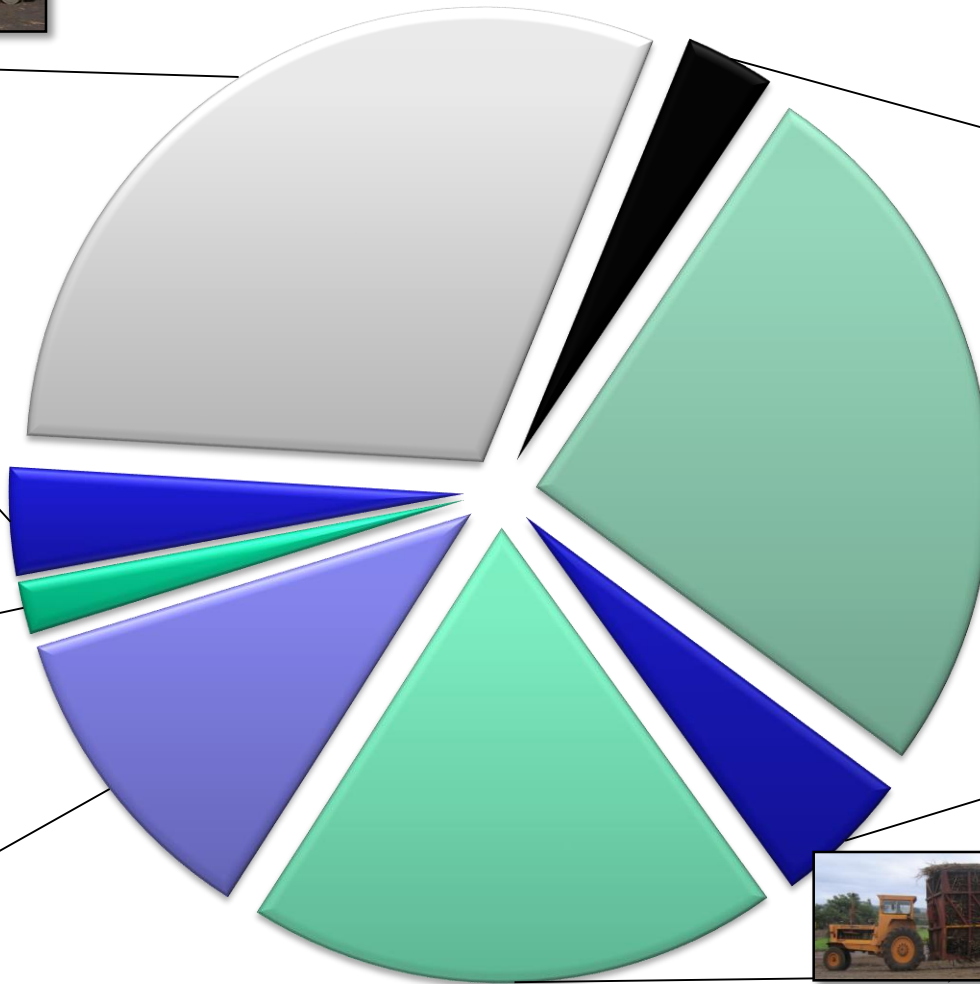Truck Tractor, Tri-axle Trailer
4%

Truck Tractor, Double Axle Trailer
2%

Tractor, Double Trailers
11%

Rigid Truck
3%

Rigid Truck, Drawbar Trailer
26%

Tractor, Single Trailer, Single Axle
5%

Multi Axle
19%

PAYLOAD DETERMINATION: VEHICLE COMBINATIONS

Peter Tweddle

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1: INFORMATION & PROCEDURES

DIMENSIONS: axles/ axle units & total length; C-C of extreme axles

INSPECT: Manufacturer data plates, tyre ratings

LOAD: Payload (&CoG) for each semi-trailer axles/ axle units

WEIGH: Unladen mass of axles/ axle units

CALCULATE: Permissible maximum combination mass (PMCM)

CALCULATE: Payload mass distribution- rear axle to front axle

CHECK: Compliance of tyres, rims, wheel and axle group loads
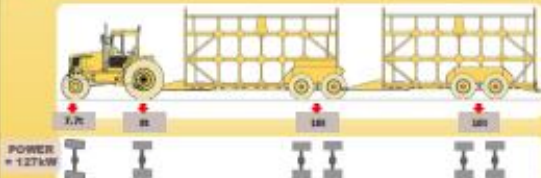
CHECK: Compliance of Power, traction and steering

CHECK: Overall dimensions & bridge formula compliance

3: REG. 240

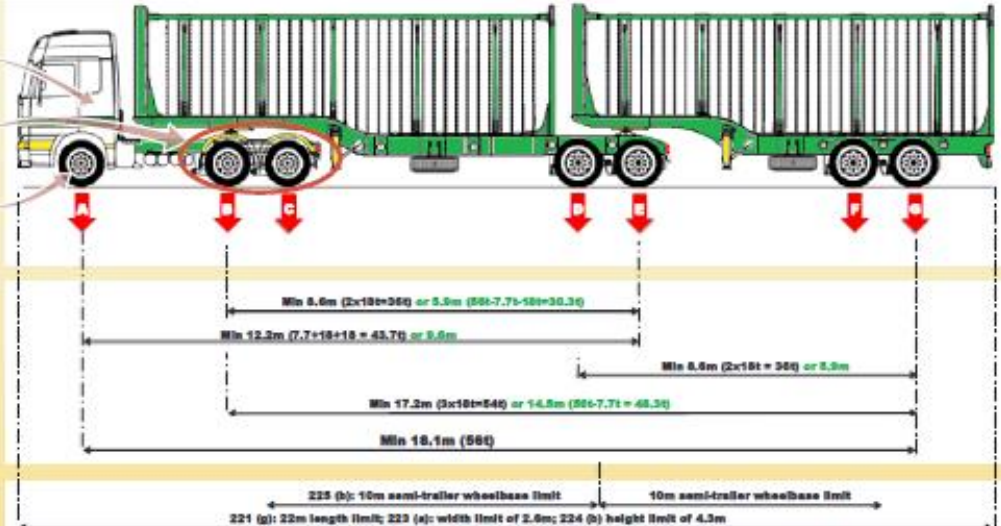| REG. 240: (Max. axle mass load)	STEERING:	NON-STEER: (2 wheels/axle)	NON-STEER: (4 wheels/axle)
per wheel:	3850kg	4000kg	
per axle:	7700kg	8000kg	9000kg
2 axle unit:	15400kg	16000kg	18000kg
3 axle unit:	23100kg	24000kg	24000kg

2: OVERVIEW OF REQUIREMENTS

POWER REQUIREMENT: (REG 239) 240kg/kW x P (trucks) >234kW for 56t 400kg/kW x P (tractor)

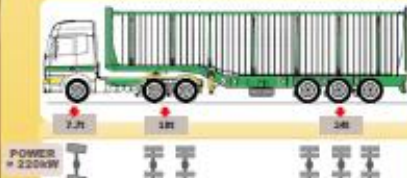**TRACTION: (REG 239)** Trucks: 5x Massload >11200kg for 56t H Tractor: 6x Massload

STEERING: (REG 242) >11% of Tr. & 1st semi >6800kg for 56t H Tractor: >12% of tractor unit only

BRIDGE FORMULA: (REG 241) Minimum distance (m): (N-18)/2.1 = 18.1m (56t) or Max Load: Distance x 2.1 + 18 (t)

DIMENSION LIMITS: (REG 221,223,224):
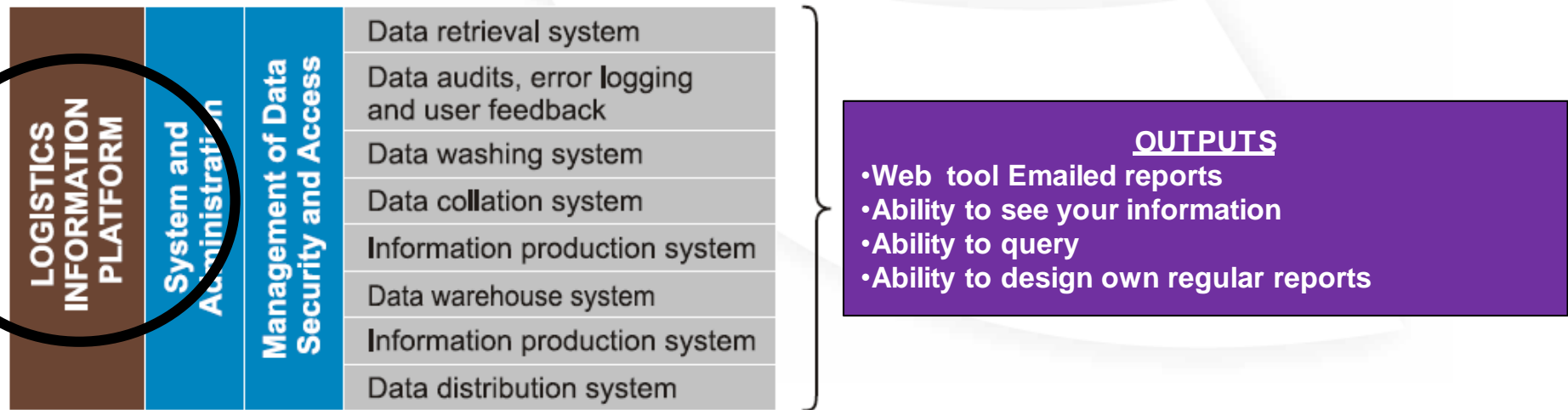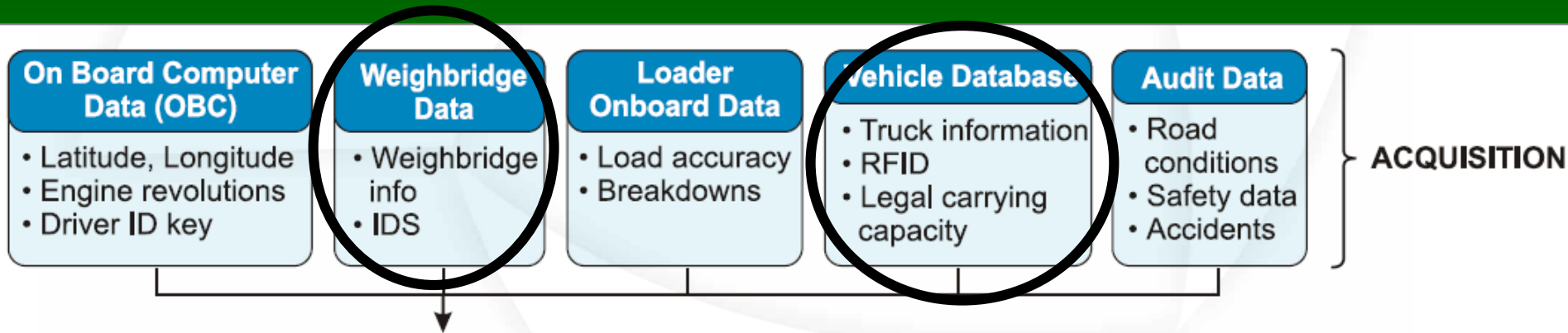

4: EXAMPLE: PMCM DETERMINATION: H. TRACTOR

POWER = 127kW

ITEM:	A:	B:	C+D:	E+F:	LEAST OF:
TYRES:	Speed & load ratings; load + tyre uniformity: 16.8x24 1.8b				3.27t
AXLE LIMITS (Reg. 240):	7.7t	8t	18t	18t	47.7t
AXLE LIMITS (MANUF.):	3.2t	8t	18t	18t	43.2t
GCM:	Vehicle GCM limit off data plate – eg. 60t				60t
POWER:	400kg/kW (Tractors) x 127kW = 50.8t				50.8t
TRACTION:	Theoretical: drive axle unit @ 8t x 6 (Tractors) = 48t				48t
STEERING:	Theoretical: Tractor = (3.2t+8t) x 12%= 1.3t				>1.3t
BRIDGE:	1st to last axle (A-F): 20.3m x 2.1 + 18 = 60.6t				60.6t
BRIDGE:	B-F: 17.7m x 2.1 +18 = 51.8t + 3.2t for steer axle:				54.8t
BRIDGE:	C-F: 8.1m x 2.1 +18 = 35.4t + 3.2t steer + 8t drive:				47.6t
BRIDGE:	A-D: 11m x 2.1 +18 = 43.75t +18t for last axle set:				59.75t
BRIDGE:	B-D: 7.8m x 2.1 +18 = 36.4t + 3.2t steer +18t trailer:				55.6t
COMBINATION LIMIT:	Permissible maximum combination mass (PMCM) = 50t				<63.2t

5: EXAMPLE: PMCM DETERMINATION: TRIAXLE

POWER = 220kW

ITEM:	A:	B+C:	D+E+F:	-	LEAST OF:
TYRES:	Speed and load ratings; load uniformity; tyre uniformity				
AXLE LIMITS (Reg. 240):	7.7t	18t	24t	-	49.7t
AXLE LIMITS (MANUF.):	7.8t	18t	24t	-	49.8t
GCM:	Vehicle GCM limit off data plate – eg. 75t				75t
POWER:	240kg/kW (Trucks) x 220kW = 52.8t				52.8t
TRACTION:	Theoretical: drive axle unit @ 18t x 5 = 90t				90t
STEERING:	Theoretical: Truck + 1st semi = (7.5t+18t+24t)x11%= 5.4t				>5.4t
BRIDGE:	1st to last axle (A-F): 14.6m x 2.1 + 18 =48.7t				48.7t
BRIDGE:	B-F: 11.3m x 2.1 +18 = 41.8t + 7.8t for steer axle:				49.6t
COMBINATION LIMIT:	Permissible maximum combination mass (PMCM) = 50t				<48.7t

6: EXAMPLE: PMCM DETERMINATION: INTERLINK

POWER = 260kW

ITEM:	A:	B+C:	D+E:	F+G:	LEAST OF:
TYRES:	Speed and load ratings; load uniformity; tyre uniformity				
AXLE LIMITS (Reg. 240):	7.7t	18t	18t	18t	61.7t
AXLE LIMITS (MANUF.):	7.8t	18t	18t	18t	61.8t
GCM:	Vehicle GCM limit off data plate – eg. 75t				75t
POWER:	240kg/kW (Trucks) x 260kW = 62.4t				62.4t
TRACTION:	Theoretical: drive axle unit @ 18t x 5 = 90t				90t
STEERING:	Theoretical: Truck + 1st semi = (7.7t+18t+18t)x11%= 4.8t				>4.8t
BRIDGE:	1st to last axle (A-G): 19.25m x 2.1 + 18 =58.43t				58.43t
BRIDGE:	B-G: 16m x 2.1 +18 = 51.6t + 7.8t for steer axle:				59.1t
BRIDGE:	D-G: 8.75m x 2.1 +18 = 36.4t + 7.8t steer + 18t drive:				61.88t
BRIDGE:	A-E: 12m x 2.1 +18 = 43.75t +18t for last axle set:				61.2t
BRIDGE:	B-E: 8.75m x 2.1 +18 = 36.4t + 7.8t steer + 18t trailer:				61.88t
COMBINATION LIMIT:	Permissible maximum combination mass (PMCM) = 50t				<50t

Payload Analysis

On Board Computer Data (OBC)	Weighbridge Data	Loader Onboard Data	Vehicle Database	Audit Data
• Latitude, Longitude • Engine revolutions • Driver ID key	• Weighbridge info • IDS	• Load accuracy • Breakdowns	• Truck information • RFID • Legal carrying capacity	• Road conditions • Safety data • Accidents

ACQUISITION

LOGISTICS INFORMATION PLATFORM | **System and Administration** | **Management of Data Security and Access**

- Data retrieval system
- Data audits, error logging and user feedback
- Data washing system
- Data collation system
- Information production system
- Data warehouse system
- Information production system
- Data distribution system

OUTPUTS
- Web tool Emailed reports
- Ability to see your information
- Ability to query
- Ability to design own regular reports

Mill Area Process

- Mill Area Strategy
- Code 90% of the Vehicles
- Collect Information
- Feedback
- Action

Report back

Sugar RTMS
steering committee
June RTMS Sugar Report
2015

- Overloads
- Under loads
- Outside strategy
- Un-coded vehicles

Overload results

% Incidence of Overloading Over Tolerance

Legend: Overloads over 2% Received — Overloads over 2% Dispatched — Overloads Over 5% Received
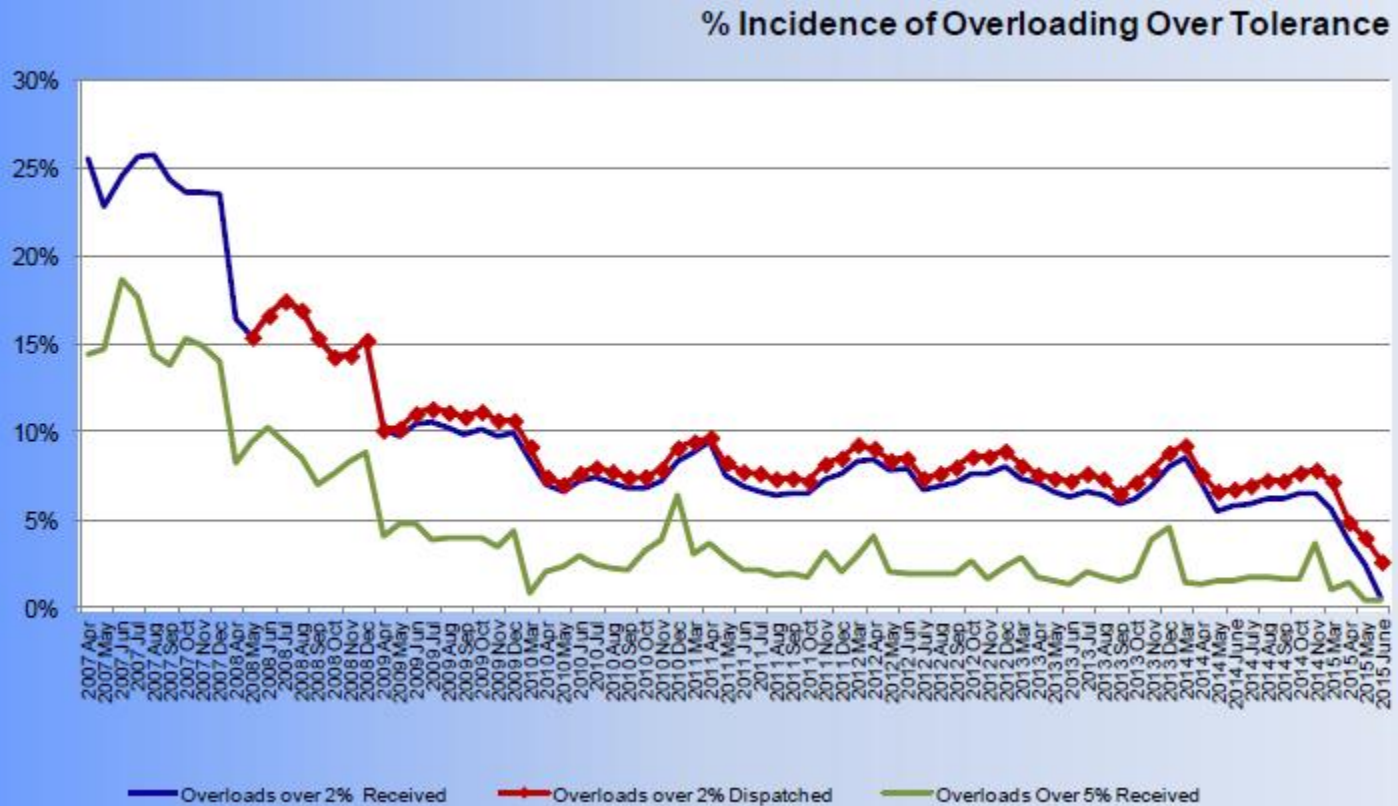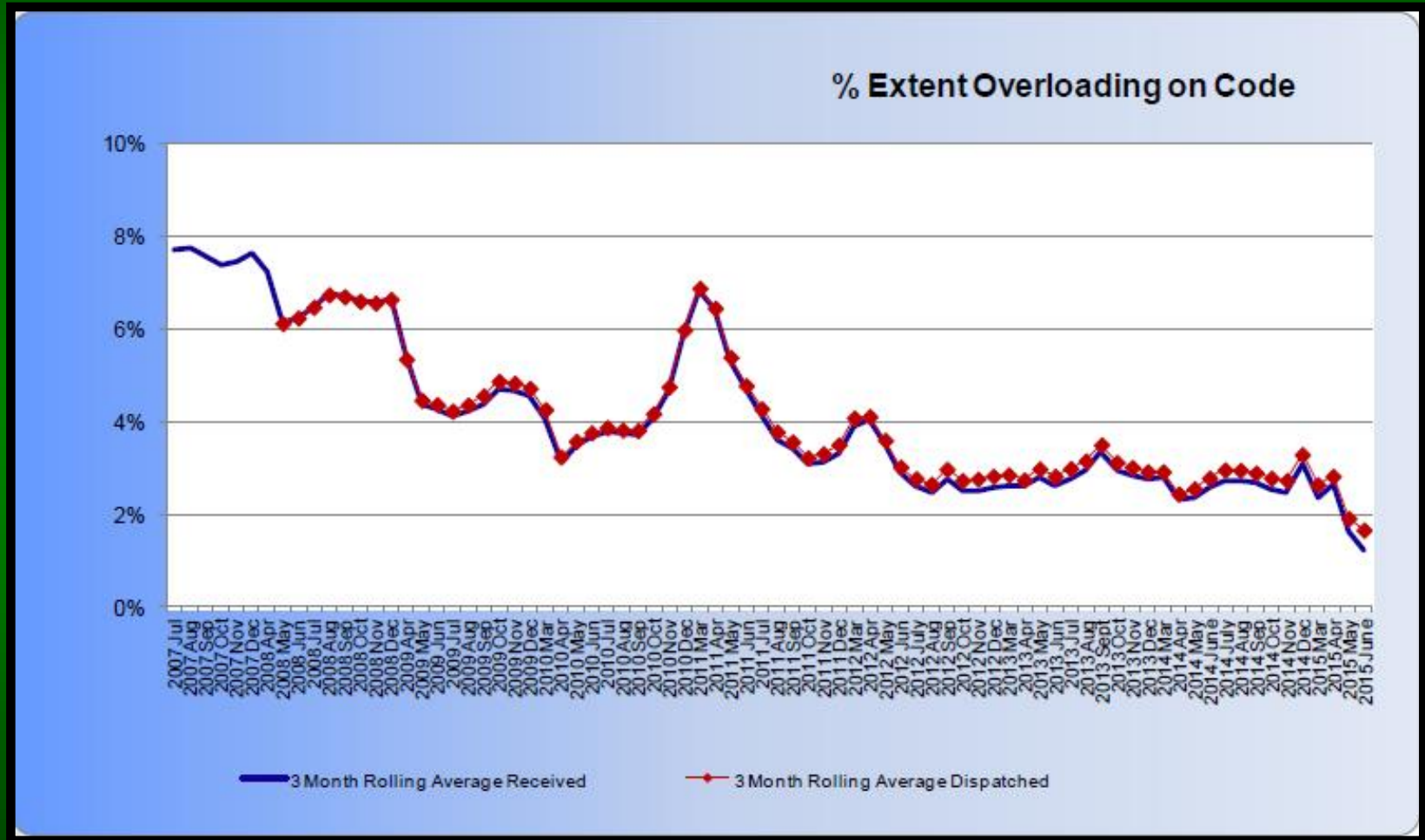
Overload results

Loading Pattern 2007

Sugar RTMS Gross Mass Distribution 2007
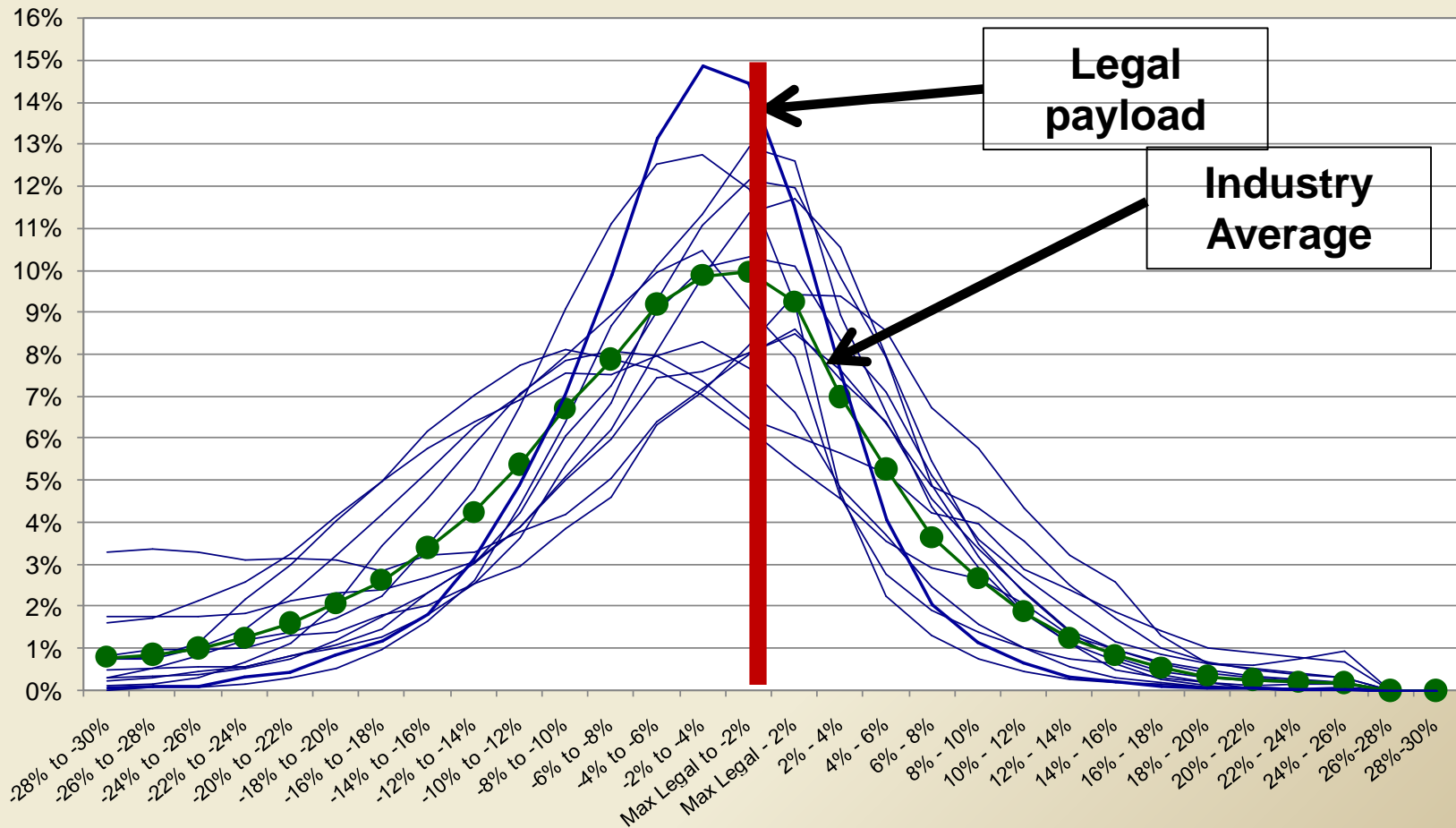
Industry load distribution

Sugar RTMS
Gross mass distribution
RTMS mills

Legend: RTMS '07, RTMS '08, RTMS '09, RTMS '10, RTMS '11
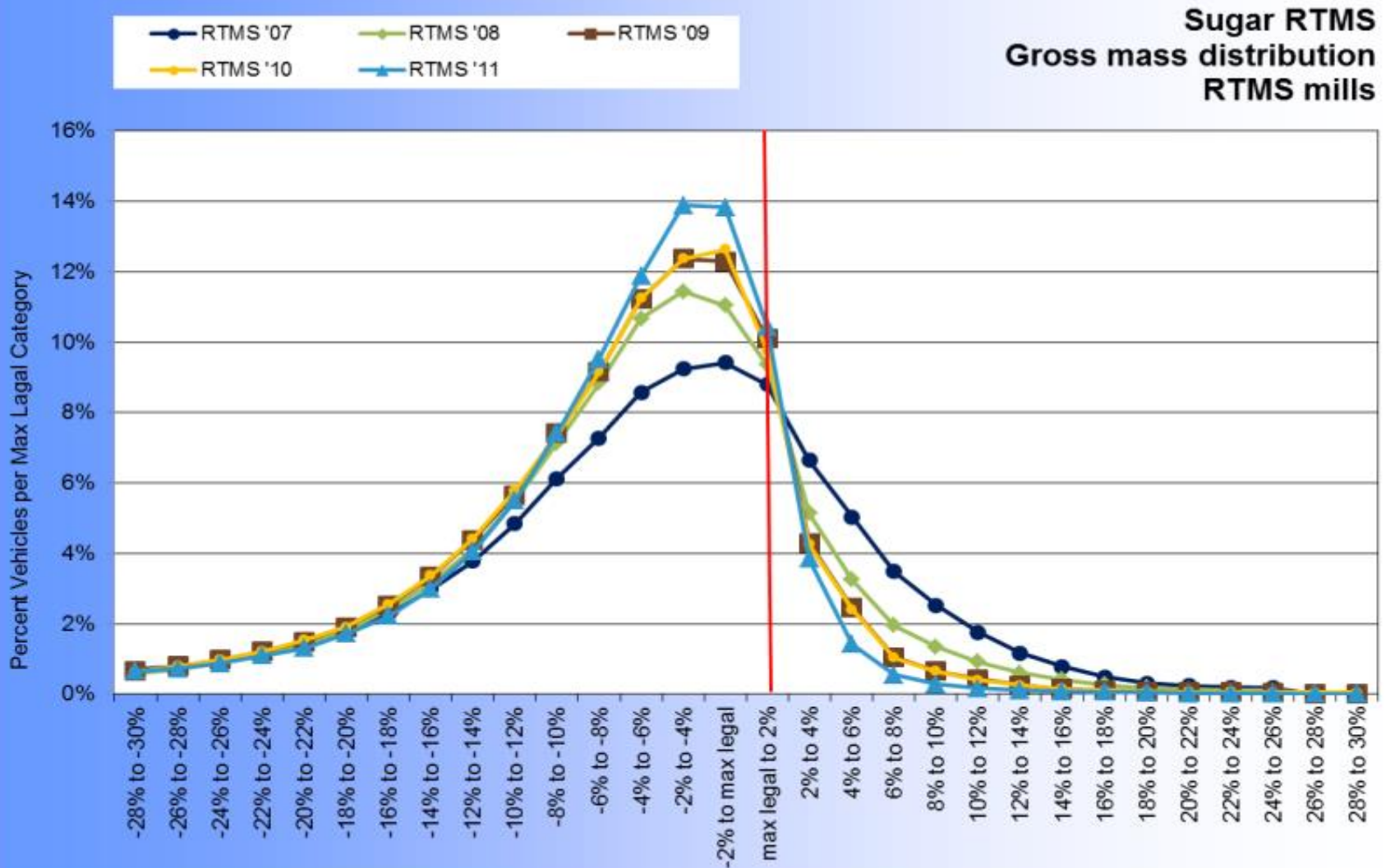
Payload results
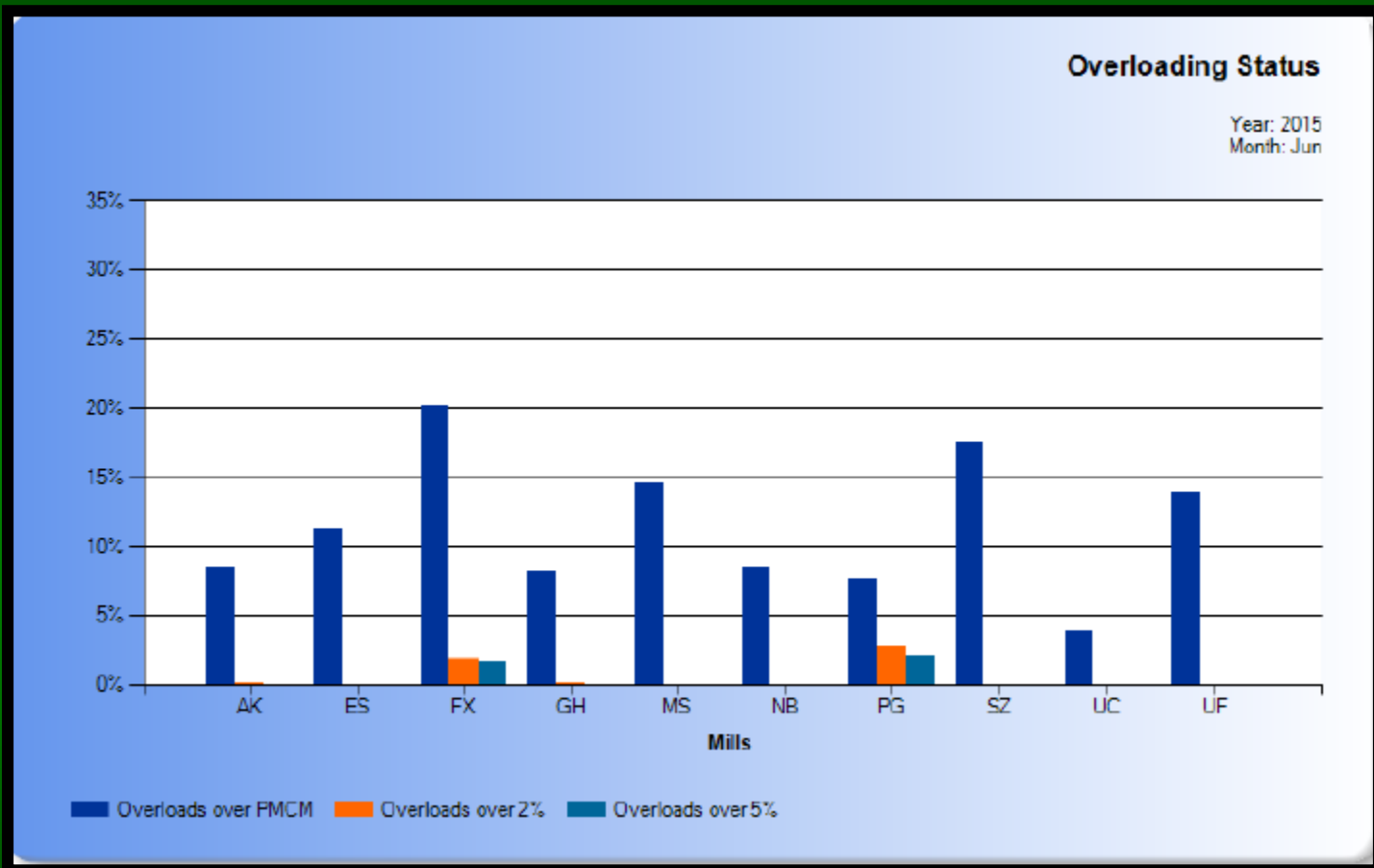
Large haulier loading performance
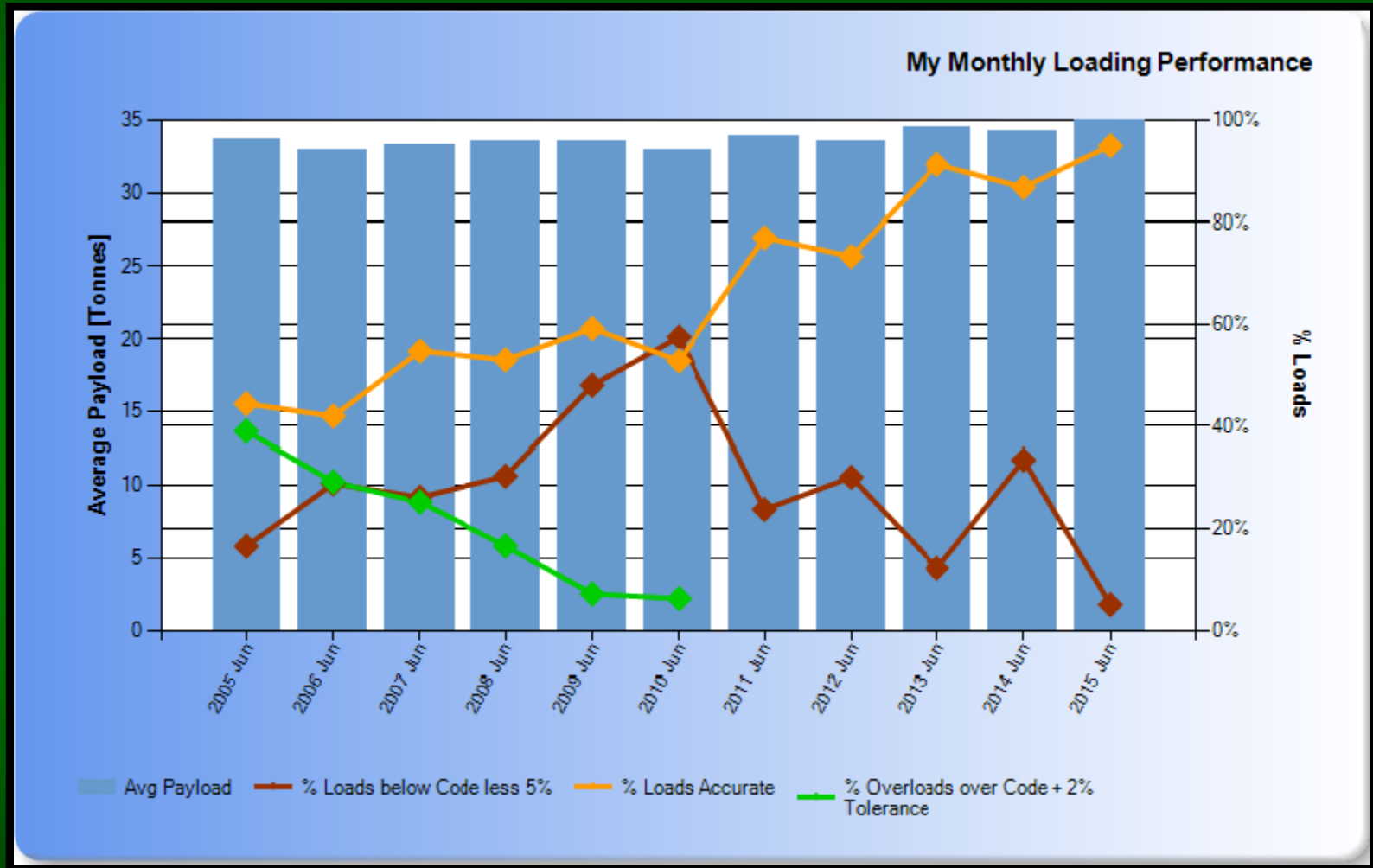
Vehicle Payload t
2007

Average payload 4.5 t less than legal Payload
15% less than optimum
For every seven trips you could save 1 trip

Payload management
On board weighing
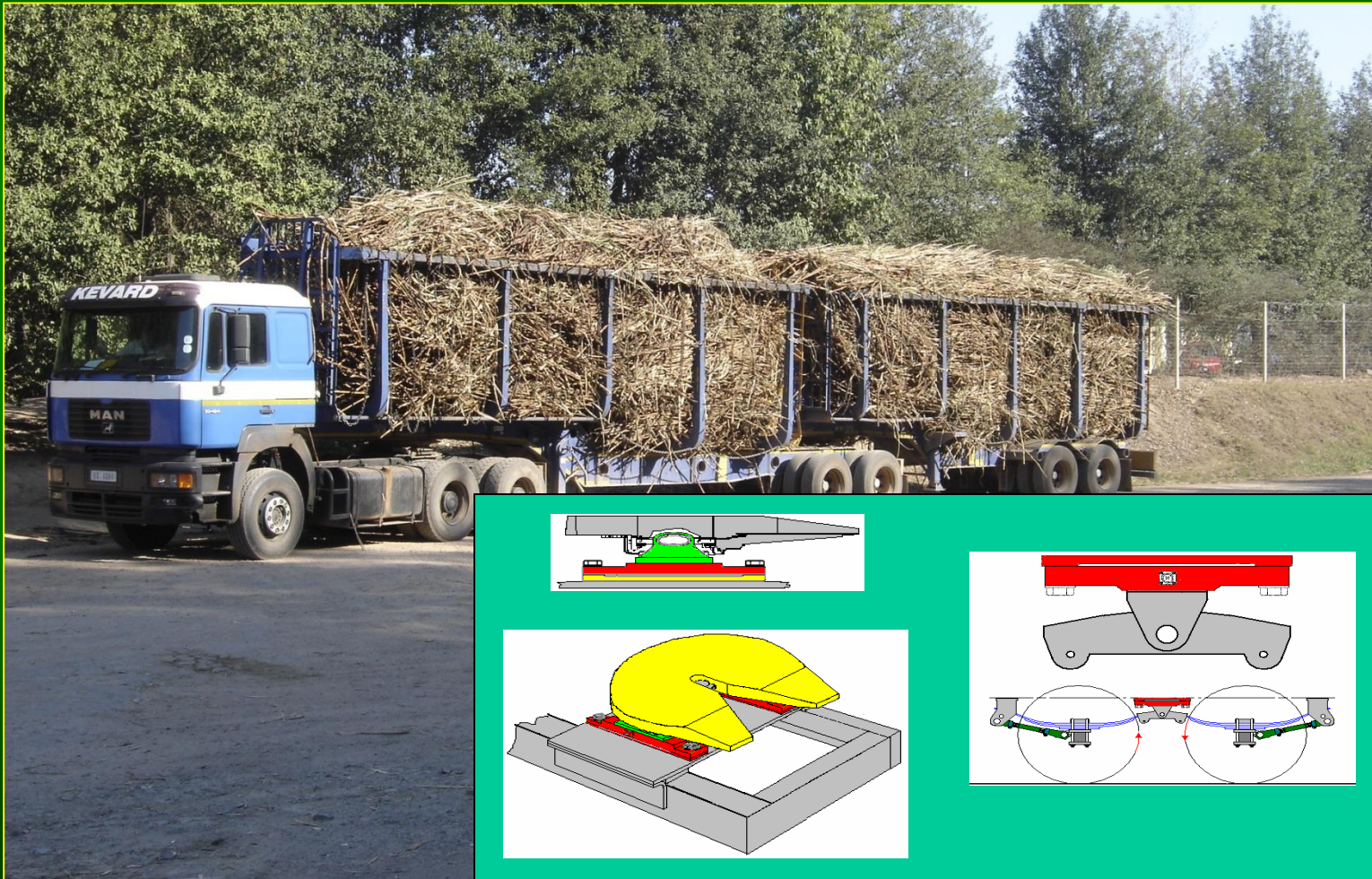
With and without load cells
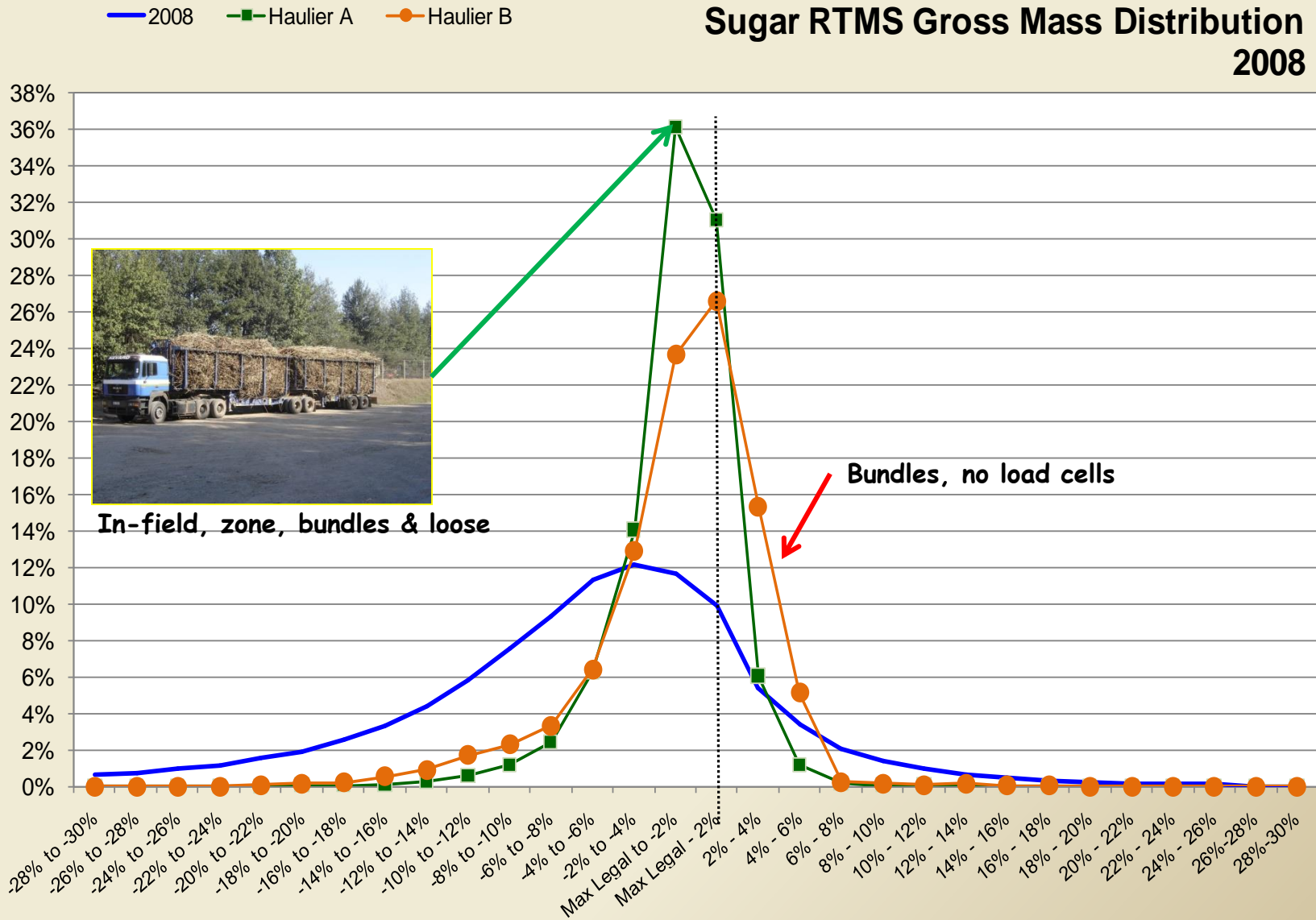
With overload control one can progress to RTMS

- Self Regulation, RTMS
  - Overload control
  - Driver wellness
  - Vehicle maintenance

- Timber, Sugar, Coal, General freight

- Benefits
  - Improved management, lowers costs
  - Lower insurance, Finance Charges
  - Concessions, weigh less
  - Timber contracts

PBS Smart Truck

To get Smart Truck one has to have RTMS

SAPPI vehicle

Smart Truck

- ## Mondi vehicle

PBS COMBINATION – FIRST LOAD DECEMBER 2007 – PAYLOAD 45.3 – GCM 64 TONNES

18 % saving in cost

Smart Truck Results

- Saved 18% in cost (60 Vehicles - 50Mkm)
- Used less fuel per t of product delivered
- Lower emissions
- Fewer vehicles (almost a 20% increase in payload)
- Less road damage
- Safer vehicles (incidents reduced by 5)
- Trips saved

Logistics Achiever Awards

Deputy Minister of transport
Ms. Sindisiwe Lydia Chikunga, MP

- I encourage industry to build on the successes achieved in the implementation of the RTMS Standards in the broader transport sector. I also urge all industry stakeholders to embrace this visionary system that will not only improve efficiencies in the South African logistics value chain, but also enable best practice sharing with the Southern Africa Development Community. I therefore commend the pro-activity shown by the leadership of this initiative and have no doubt that it will lead to tremendous improvement in the performance of the logistics value chain.
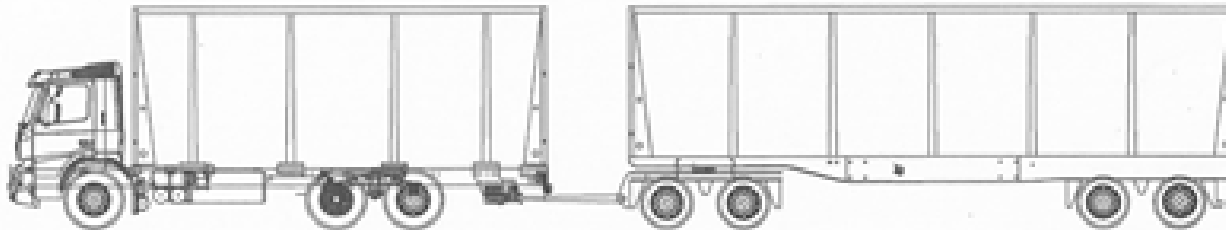
SUMMARY

Sugarcane load control Strategy

- Safer vehicles
- Significant cost savings
- Improved safety
- Improved loading practices
- Reduced road damage
- RTMS accredited, lower risk
  - Reduced insurance costs
  - Reduced finance charges
  - Weigh less

Consignor / ee

A N Other (Pty) Ltd

Vehicle Data Sheet

Total Vehicle Allowable M	56000	kg
Truck empty Weight:	20300	kg
Max Load weight:	35700	kg

Max Axle Group Masses:

STEER	DRIVE	TRAILER FRONT	TRAILER REAR	
7500	18000	18000	18000	

Vehicle Empty Axle Masses:

4000	6300	5500	4500	20300	Max

Load Mass Distribution across Axle Groups:

				Total	
3500	9200	11000	12000	35700	

Gross Axle Masses to put on Consignment Note:

7500	15500	16500	16500	56000	

Weight Determination Method:

Load to be 200mm below the spiller in the front half of the rigid truck, level with the top of the truck at the back and slightly bread loafed evenly across the top of the trailer or as per onboard weighing.

Fleet No;	
Truck Reg:	

Trailer Reg

Acknowledgements

- KZN DOT
- SACGA
- Crickmay
- SA Sugar Mills
- Hauliers
- Autolab
- SASRI

THANK YOU

Weighing Accuracy of Haulier