

Sugar Cane Harvest Management Scheme 2018

Ballina Shire Council



Sugar Cane Harvest Management Scheme (SCHMS)

SCHMS Snapshot

- Productivity scheme that encourages full use of general mass limits while maintaining axle mass compliance
- Up to 5% additional mass with flexibility for axle mass compliance
- One transport operator with a record of continuous improvement for safety and compliance
- Direct community benefit through reduced
 - Truck trips
 - Pavement wear
 - Congestion
 - Environmental impact
 - Risk of crashes
- 5 Councils and Roads and Maritime Services approved the SCHMS for 2018 season



Sugar Cane Harvest Management Scheme

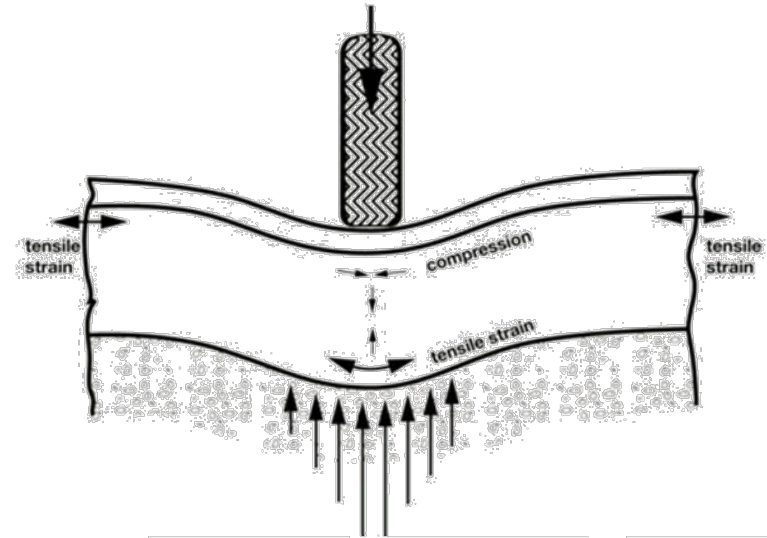
Benefits – Reduced truck trips

Ballina Shire Roads	2017 Season with SCHMS			Without SCHMS		
	Tonnes	Average Bin Weight	Trips	Average Bin Weight	Trips	Additional trips
Newry Bar Swamp Rd	5,982	20.56	291	17.96	333.13	42.13
Ross Lane	5,581	20.67	270	18.07	308.85	38.85
Tevan rd	8,372	21.41	391	18.81	445.04	54.04
Uralba Rd	661	20.67	32	18.07	36.60	4.60
Pimlico Rd	22,109	21.20	1,043	18.60	1,188.82	145.82
Pimlico River Rd	30,771	21.06	1,461	18.46	1,666.75	205.75
River Drive	92,131	20.74	4,443	18.14	5,079.95	636.95
Back Channel Rd	9,436	20.34	464	17.74	532.02	68.02
Bagotville Rd	4,177	20.78	201	18.18	229.74	28.74
New Whytes Rd	5,509	21.27	259	18.67	295.06	36.06
Total	221,525	21	8,855	18	10,116	1,261

Sugar Cane Harvest Management Scheme

Equivalent Standard Axle (ESA) calculations

- Substantial pavement wear is primarily caused by vertical load. The greatest impact for this comes from overloaded axles.
- Pavement wear is calculated using the Equivalent Standard Axle (ESA) formula. The ESA formula is a way to compare the effect of a wide range of heavy vehicles on pavement. The result is expressed in ESA Kilometres.
- Each vehicle has a calculated ESA rating that factors in mass, axle configuration and pavement type. The ESA rating for a six-axle semi trailer is 5.54 loaded and 1.68 unloaded on a spray sealed flexible pavement road. The larger the rating, the greater the pavement wear.

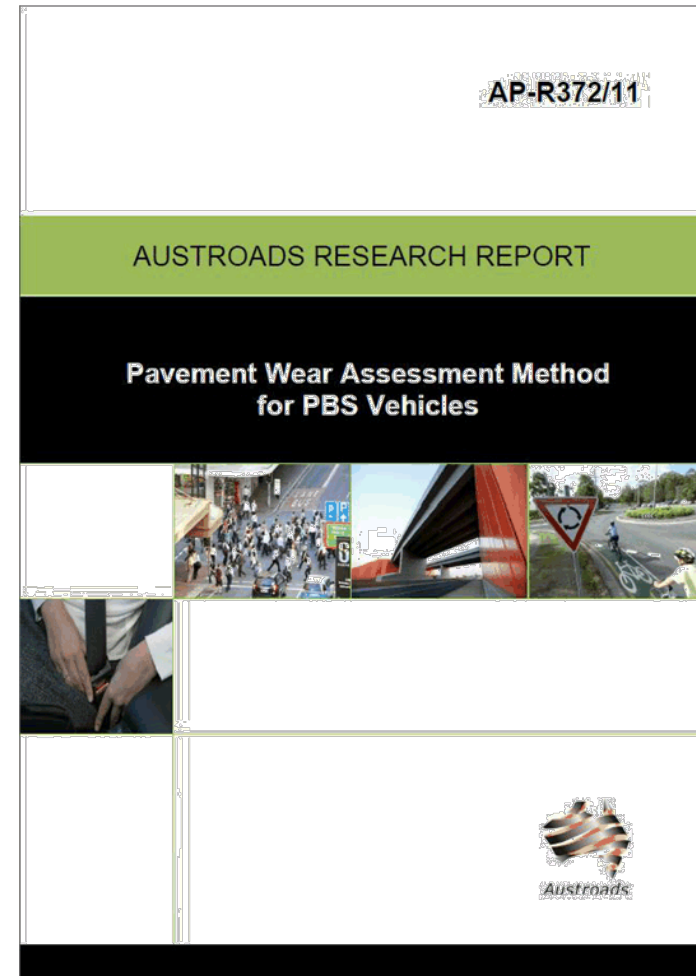


$$SAR = \sum_{i=1}^{i=m} (L_i / SL_i)^{LDE}$$

Sugar Cane Harvest Management Scheme

Impact of additional mass

- When calculating pavement wear, studies have shown higher mass limits (HML) with road friendly suspension causes no additional pavement wear impact over general mass limits (GML). That means the same ESA rating is used for both mass limits which in turn means any trips saved by using up to HML vehicles translate directly into less pavement wear
- For the estimated 1,261 trips saved on Ballina Shire roads in 2017, there was a **reduction of over 90,000 ESA Km of pavement wear** (assuming an average 10km trip each way loaded and unloaded)



Sugar Cane Harvest Management Scheme

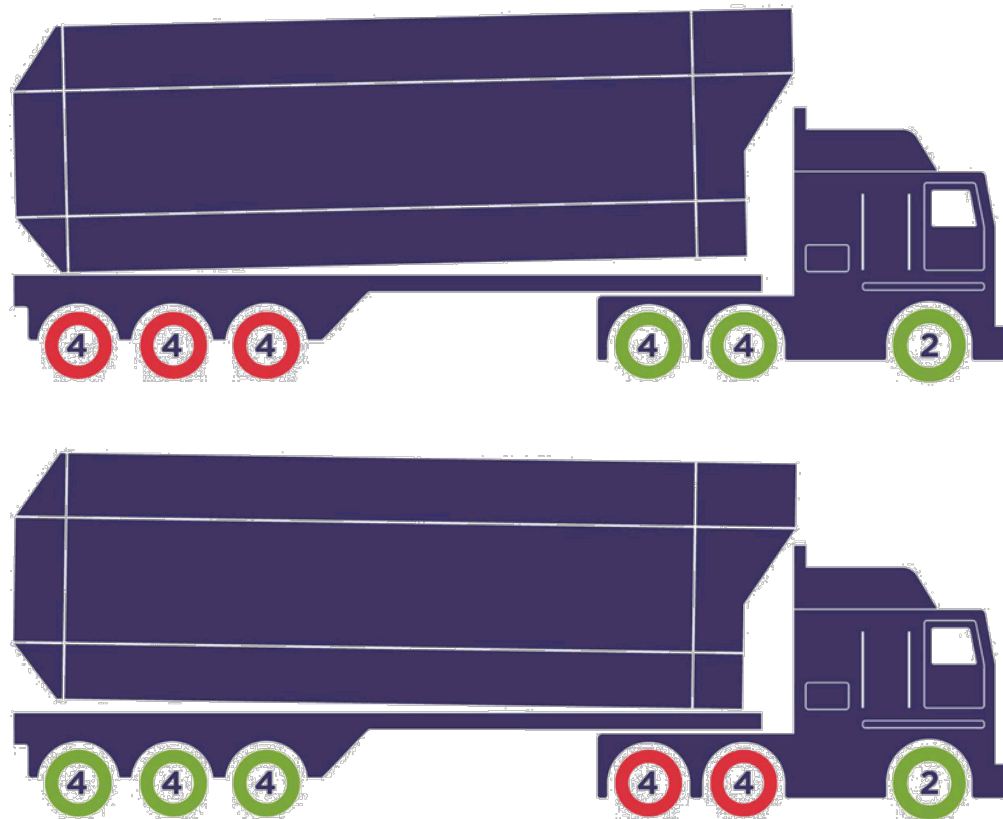
Axle masses up close



Mass limit	Tri-axle (tonnes)	Tandem axle (tonnes)	Steer Axle (tonnes)	Gross Vehicle Mass (tonnes)
General Mass Limits	20.0	16.5	6.0 – 6.5	42.5 – 43.0
SCHMS	21.63 – 22.13	16.75 - 17.0	6.0 – 6.5	44.63 – 45.13
Higher Mass Limits	22.5	17.0	6.0 – 6.5	45.5 - 46.0

Sugar Cane Harvest Management Scheme

Axle mass compliance before SCHMS



In 2015, before SCHMS, axle mass compliance was poor.

Bin masses averaged **20.85 tonnes** which meant gross mass compliance achieved but axle masses were erratic.

Sugar Cane is a live load that is difficult to manage without strict loading practices and mass monitoring technology.

Vehicles with overloaded axle groups cause the most damage to pavements and pose safety risks due to potential loss of vehicle control.

Sugar Cane Harvest Management Scheme

Axle masses with SCHMS



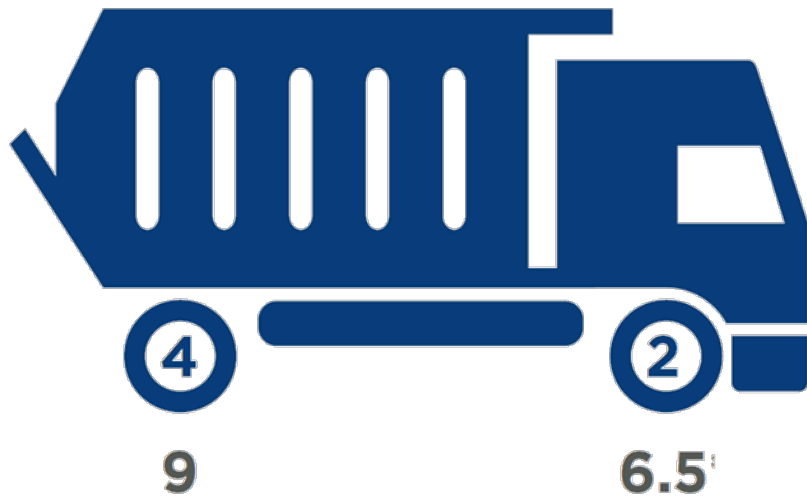
Since the introduction of SCHMS and strong commitment from Sunshine Sugar, axle mass compliance has improved significantly and average bin masses have reached **22.01 tonnes**. Mass monitoring equipment fitted to vehicles and load management procedures by Sunshine Sugar have delivered significant pavement and safety outcomes for the community.

Sugar Cane Harvest Management Scheme

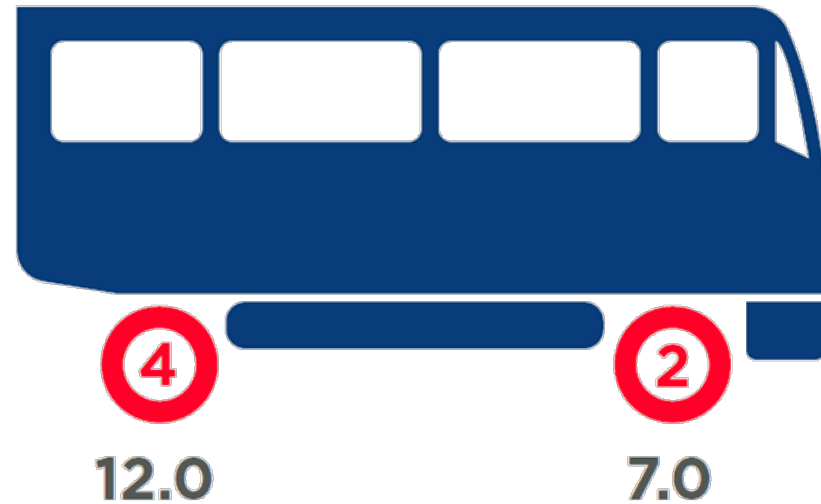
Comparing axle masses

Worst case axle mass scenario is already general access on NSW roads:

Garbage Truck



Bus



Sugar Cane Harvest Management Scheme

Additional benefits of reduced trips

Every truck trip saved reduces –

- Pavement wear
- Congestion
- Pollution – air, noise and dust
- Fuel use
- The risk of crashes involving heavy vehicles.

A crash is 7 times more likely to be fatal when it involves a heavy vehicle . Interestingly, the light vehicle is statistically more likely to be at fault in a crash involving a heavy vehicle



Sugar Cane Harvest Management Scheme

A motivated and compliance focused transport operator

Sunshine Sugar and SCT have invested in:

- 32 new prime movers costing \$6 million over the last 10 years to maintain a modern truck fleet with the latest safety equipment
- Installed mass monitoring on all vehicles in 2017 to ensure axle mass and gross mass compliance
- Installed equipment on all vehicles to enable over mass bins to be safely unloaded at the farm and not taken on road
- Installed in-vehicle telematics to monitor location, speed and fatigue of drivers



Sunshine Sugar and SCT

Compliance performance in 2017

Through investment in technology and loading procedures, compliance performance in 2017 lifted to:

- **0.22%** of deliveries exceeded the SCHMS gross mass limits
- Only 13% of deliveries exceeded GML gross mass
- 24 deliveries exceeded HML mass or 0.05% of deliveries
- 2.9% of axle mass readings exceeded SCHMS limits



Sugar Cane Industry

Benefit to Ballina Shire Community

- 50% grower owned with around 500 grower Members.
- Employ 400 people directly and 250 additional seasonal employees during harvest.
- 378 cane growing businesses and 18 cane harvesting businesses
- Grow harvest and process ~ 2.4 million tonnes of sugar cane per annum
 - Raw Sugar – 270,000 tonnes
 - Molasses – 72,000 tonnes
 - Bagasse – 680,000 tonnes
 - Mill mud – 200,000 tonnes
- The industry accounts for \$230 million of regional economic output.
- ~ 5% of the Australian industry.



Weighing up the benefits of the SCHMS to Ballina

Benefits of SCHMS to Ballina Shire:

- One operator for the transport of sugar cane
- Visibility of axle masses and gross masses
- Visibility of network use through vehicle tracking
- Reduced pavement wear, congestion, noise, dust and vehicle emissions
- Less exposure to heavy vehicle crashes
- Improved economic outcome for key local industry

Risks to not approving SCHMS in 2018:

- Approximately 90,000 ESA Km additional pavement wear
- Increased safety and environmental risks from additional truck trips
- Substantial economic pressure on key local industry through reduction in competitiveness
- Complex rostering to isolate Ballina roads from SCHMS loadings

