

Asset Management

Calculating the Road/Bridges
Backlog and Road Funding Issues
- Joint Presentation

21 June, 2016

Calculating the Road/Bridge Backlog

The Process:

Determining the Infrastructure Backlog is a process that has two parts.

- Technical Assessments of Assets, eg Road Segment or Bridge Condition
- Application of the Integrated Planning and Reporting, 2013 (NSW State Government) requirements and the Local Government Code of Accounting Practice for the Financial Reporting of the Condition Ratings in Special Schedule 7
- Technical Staff provided a comprehensive presentation to the November, 2014 Civil and Environment Committee Meeting of the process.

Multi-discipline approach, that is Technical, Asset Management, Finance Staff and then External Audit Review

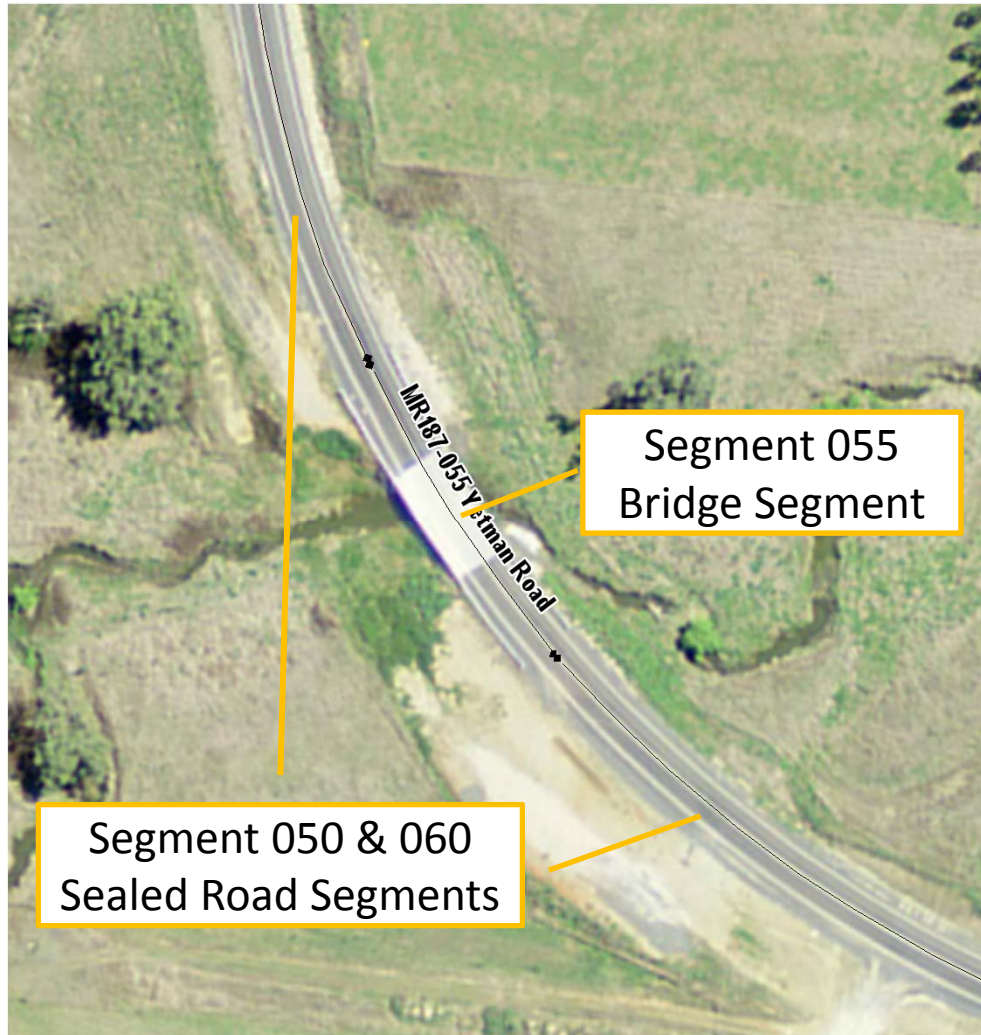
Calculating the Road/Bridge Backlog

The Process – Part 1 (Technical Component):

1. Compile a complete and accurate inventory of Council's Assets.
2. Assess/analyse the technical condition of all assets utilising "Industry Criteria/Best Practice". *(NSW RMS ROCOND 90, Austroads Guide to Asset Management, and the ARRB Bridge Assessment Methodology Best Practices were utilised by Council)*
3. Compile raw data from technical assessment and allocate an approved "IP&R Condition Rating" to each asset/segment measured in accordance with the State Government requirements.

Condition Ratings are to be those condition ratings as required under the NSW Office of Local Governments Integrated Planning and Reporting Manual, 2013 (IP&R) and the NSW Local Government Code of Accounting Practice 2015.

Compile a complete and accurate inventory of Council's Assets

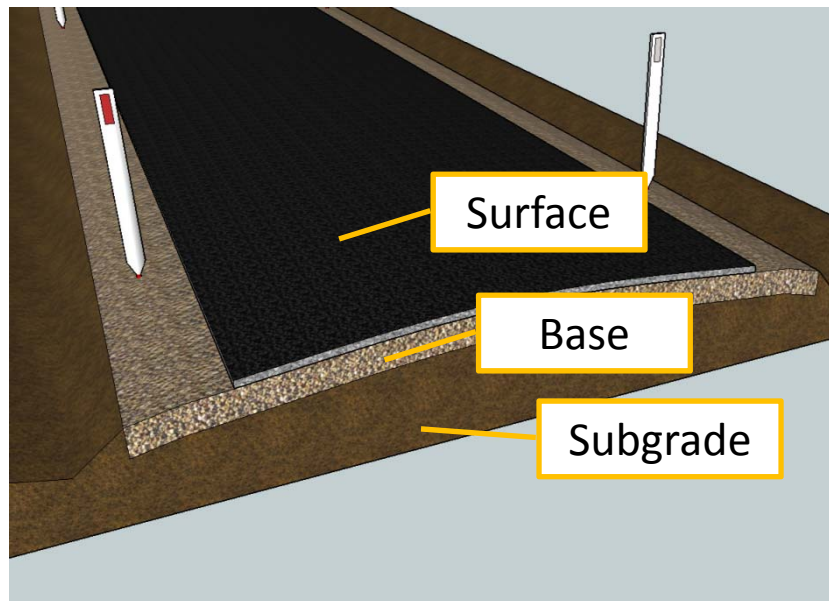


ISC divides its road assets into segments using an asset data model based upon the IPWEA endorsed ADAC standard. This includes separate segments where the pavement changes, including individual segments for each Causeway, Bridge and Major Culvert.

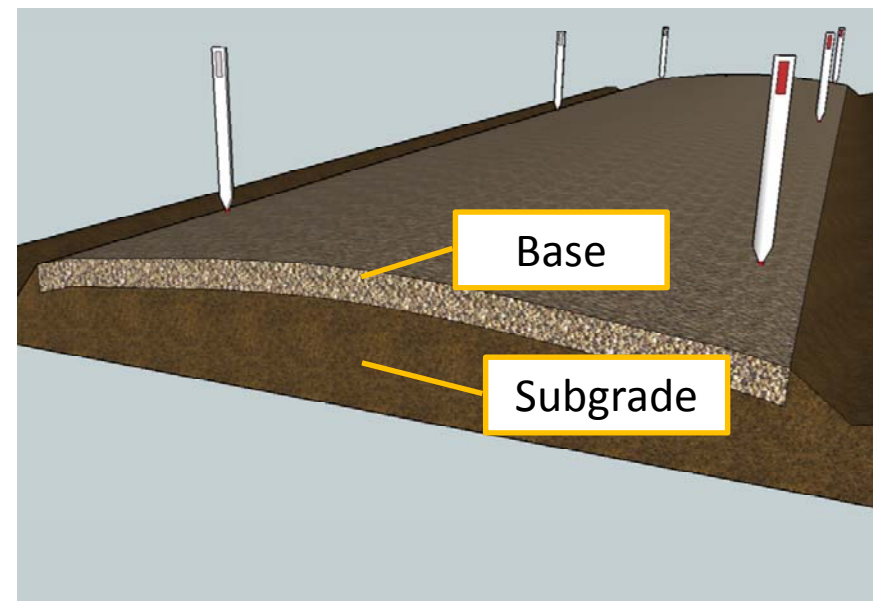
Compile a complete and accurate inventory of Council's Assets

Asset Componentisation

Sealed Roads

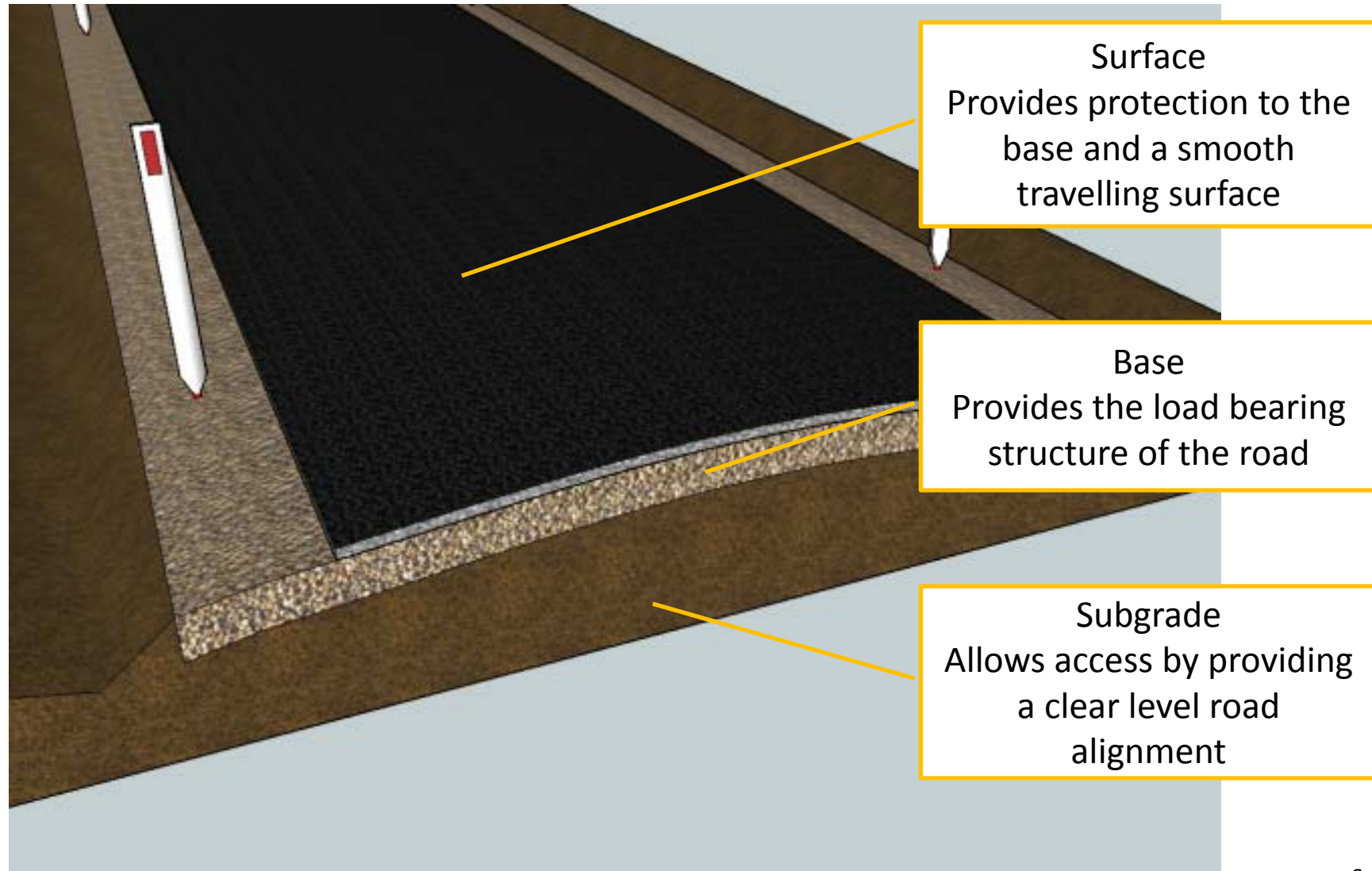


Unsealed Roads



Each component has a different useful life and provides a different aspect of the roads service. Council manages components differently and must assess the condition of each separately.

Compile a complete and accurate inventory of Council's Assets



Compile a complete and accurate inventory of Council's Assets

Result of Inventory Review

- Updated asset data model to meet modern requirements (IP&R, ISO55000, AASB13, ADAC etc.)
- Verified location and inventory information for 3500 road segments including individual assets for each component of the pavement area
- Robust asset register containing over 20,000 individual road asset components linked to GIS and works management system to allow defects, condition and work history to be recorded against each asset.

Assess/analyse the technical condition of all assets

- Pre-start meeting with members of finance, works and asset management teams also attended by Council's Auditor to ensure that data gathered would meet requirements of all stakeholders
- Weighted Condition Index developed using a number of different indicators to determine the overall condition of each individual component
- Inspection process tendered to expert contractors to ensure data is of highest quality as a benchmark for Council's ongoing assessments.
- Each indicator to be assessed in accordance with a relevant standard to ensure reliability for comparison with future assessments – ROCOND 90 and Austroads for road indicators, ARRB Methodology for bridges.
- Resulting condition rating must align with descriptions outlined in IP&R,2013 Condition Table

Calculating the Road/Bridge Backlog

IP&R Condition Ratings – Office of Local Government:

The NSW Office of Local Governments Integrated Planning and Reporting Guidelines, 2013 provide the following Condition Assessment Table for Council Roads:

Satisfactory Condition as per the Manual	Level	Condition	Description
	1	Excellent	Normal maintenance
	2	Good	Some surface/pavement structure deterioration – patching only needed for repair
	3	Average	Serious surface/pavement structure deterioration – requires resurfacing or recycling of pavement structure
	4	Poor	Deterioration materially affecting entire surface/ pavement structure – requires renovation within 1 year
	5	Very poor	Deterioration is of sufficient extent to render the surface/pavement structure unserviceable.

The FFF program requires that 98% of a Council's assets are assessed as being satisfactory (ie in Condition Ratings 1, 2 or 3) by 30 June, 2020 or that funding is available for this to occur, by this date.

Assess/analyse the technical condition of all assets

The Process – Assessment Criteria:

1. BRIDGES

Council's Bridges were assessed by the Australian Road Research Board (ARRB) utilising their nationally recognised "Bridge Assessment Methodology".

This included an extremely thorough condition assessment of all visible components of each bridge identifying any issue from cracking to loose bolts to faded paint.

Assess/analyse the technical condition of all assets

The Process – Assessment Criteria:

2. UNSEALED (GRAVEL) ROADS (4 Criteria)

Proterra Group assessed Council's unsealed road assets in accordance with the NSW RMS ROCOND 90, including physically potholing to measure the depth of gravel in every segment.

Indicators assessed were:

Unsealed Road Formation

Surface Cross-fall

Material Quality

Unsealed Road Pavement

Gravel Depth

Material Quality

Assess/analyse the technical condition of all assets

The Process – Assessment Criteria:

3. SEALED ROADS (10 Criteria)

Technical Measures

Roughness

Rutting

Cracking Severity

Cracking Extent

Road Patches

Service Measures

Traffic Volume

School Bus Route

Heavy Vehicle Volume

Five Year Accident History

Seal Width Deficiency

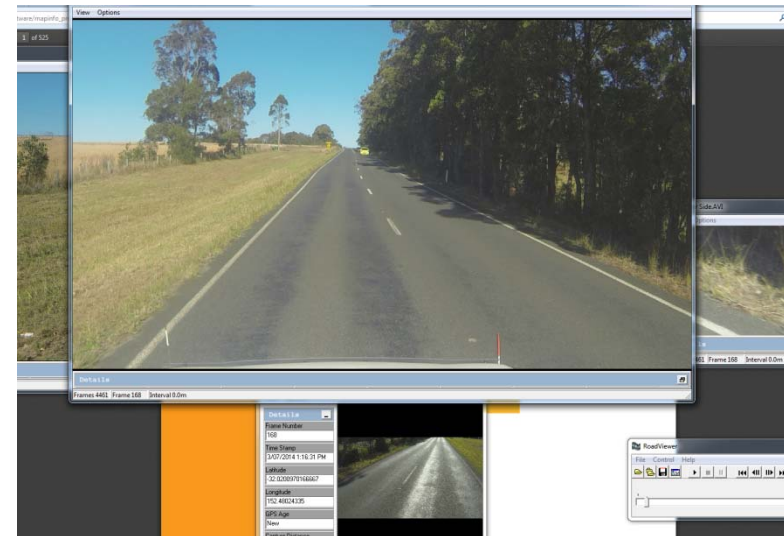
Council utilised the internationally recognised Austroads (Association of Australian and New Zealand Transport and Traffic Authorities) Guide to Asset Management, the NSW RMS ROCOND 90 Road Condition Manual, the NSW Office of Local Governments Integrated Planning and Reporting Manual, 2013 (IP&R) and the NSW Local Government Code of Accounting Practice 2015.

Assess/analyse the technical condition of all assets

AST Assessment Process

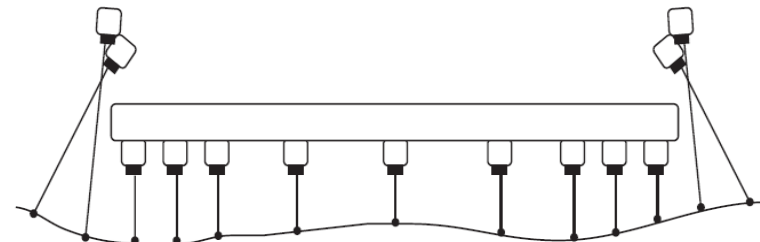
Cameras

- Different angles including close ups of road surface which were assessed by AST in accordance with our specifications
- All condition indicators were reported according to the ROCOND 90 method so future in house assessments are comparable



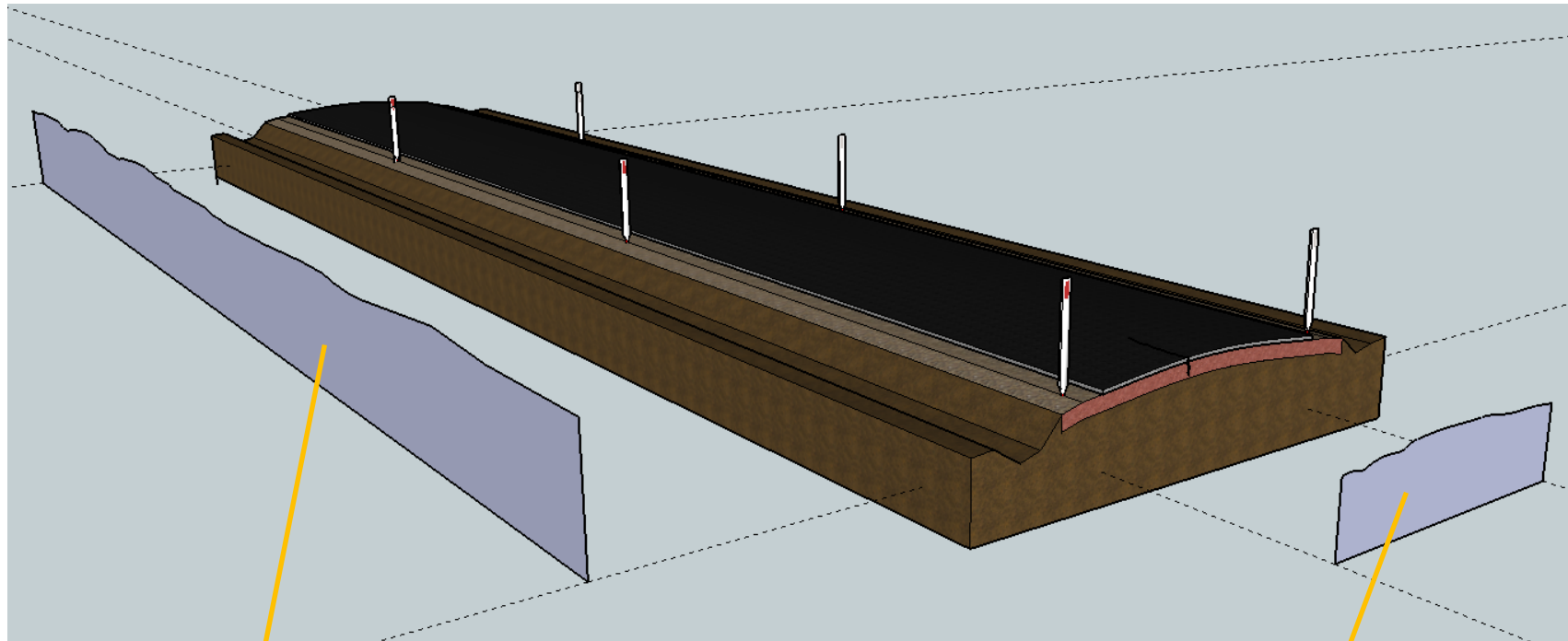
Laser Profilometer

- Provided Roughness and Rutting data consistent with Austroads specifications



Assess/analyse the technical condition of all assets

Road Profile - Roughness & Rutting



ROUGHNESS
Longitudinal Cross Section

RUTTING
Lateral Cross Section

Assess/analyse the technical condition of all assets

Technical Measure - Roughness

Roughness is not a specific type of defect in the road surface but a measurement of a vehicles response to the longitudinal profile of a road.

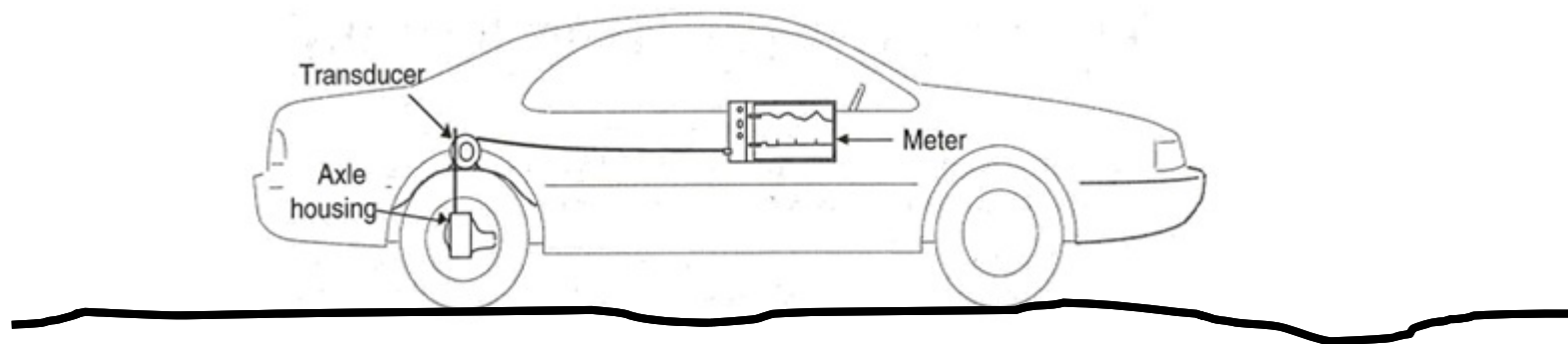
When used as part of a condition assessment process it is only relevant to flexible pavements materials like gravel and asphalt; rigid pavements such as concrete do not develop depressions and humps when they fail to bear a load, instead developing indicators such as cracking and spalling.

For sealed roads where it is not possible to inspect the components under the seal, roughness can help identify failures in a pavement's load bearing ability.

Assess/analyse the technical condition of all assets

Technical Measure - Roughness

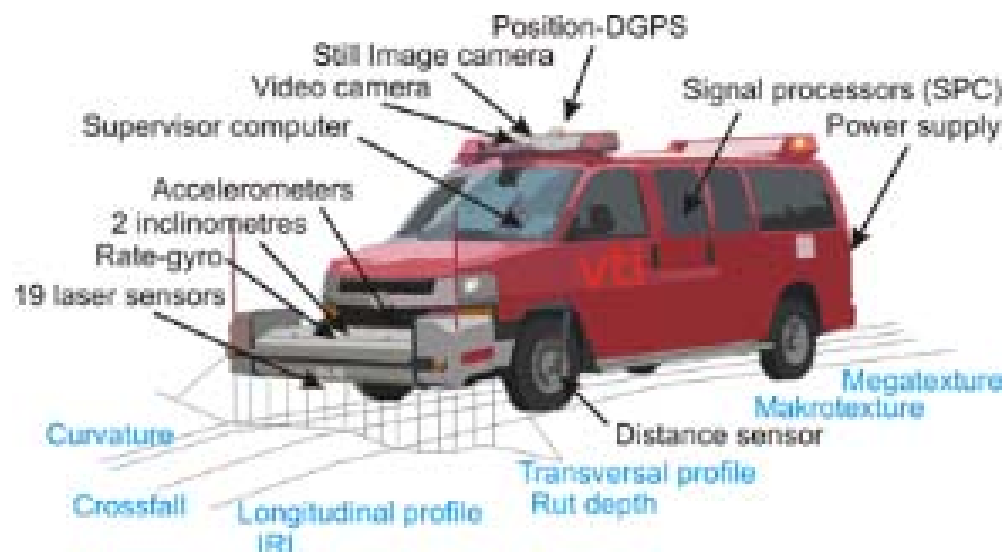
Council measures roughness using device called a NAASRA Roughness Meter (NRM) that physically records the number of vertical movements of a vehicles axle (each movement is 15.2mm either up or down) over a 1,000m travel distance and reports this as an NRM count.



Assess/analyse the technical condition of all assets

Technical Measure - Roughness

Australian Surface Testing measured the roughness of Council's roads using a laser profilometer device. This device uses lasers to develop a model of the shape of the roads surface and then feeds that model into an algorithm that determines the roads roughness rating **by modelling the response (vertical wheel travel) of a cars wheel travelling at 80km/h.** It can be operated at regular highway speeds and is much more efficient for network wide assessment.



Assess/analyse the technical condition of all assets

Technical Measure - Roughness

Roughness is not always reflective of pavement failure and must be considered in conjunction with other condition indicators. The Austroads Guide to Asset Management identifies some of the limitations of this measure such as:

“readings for short segments are usually overstated and have much less effect on ride quality”.

“High roughness readings at intersecting streets, bridge abutments and bridge decks, roundabouts, small local streets and other low speed environments will suggest a poor ride comfort level which the travelling public, travelling at less than 80 km/h, may not truly experience. It is important to recognise that high roughness readings resulting from these types of causes are not indicators of pavement distress.”

“Considerable judgement should be exercised in determining if engineering treatments would be efficacious or warranted on a particular pavement”.

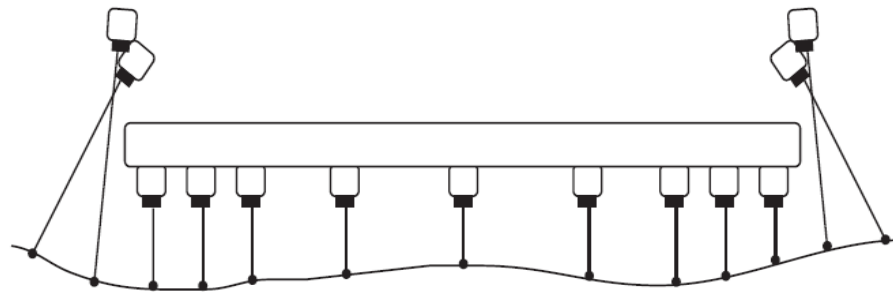
Assess/analyse the technical condition of all assets

Technical Measure - Rutting

Ruts are longitudinal depressions that form in the wheel paths of a road under traffic loading. Rutting is associated with depressions longer than 6m and was measured by AST using a laser profilometer.

When used as part of a condition assessment process it is only relevant to flexible pavements materials like gravel and asphalt; rigid pavements such as concrete do not develop depressions when they fail to bear a load, instead developing indicators such as cracking and spalling.

For sealed roads where it is not possible to inspect the components under the seal, rutting can help identify failures in a pavement's load bearing ability.



Assess/analyse the technical condition of all assets

Technical Measure - Cracking

ROCOND 90 - *“cracking is an indicator of surface failure in flexible pavements and is one of the most frequent forms of distress and the most significant”*

Cracks in the road surface allow water to penetrate into the base layer, reducing its strength and leading to failures. Road surface and pavement deterioration, roughness and rutting are all accelerated if the surface is cracked – Maintenance and Resealing Program is critical.

For sealed roads where it is not possible to inspect the components under the seal, some types of cracking can also help identify failures in a pavement's load bearing ability.

Cracking severity is rated according to the width of the crack and extent is rated according to the proportion of the segment area affected by cracking



Assess/analyse the technical condition of all assets

Technical Measure - Patches

ROCOND 90 - *“a successfully executed permanent repair. It provides a surface condition equivalent to the surrounding pavement surface and a waterproof seal”*

If a road repair has been successful there may be no pavement defects to rate in that segment of road. A new road also has no defects. That there are no defects to rate may imply that the road is brand new. However, we know that if the road has been repaired, it is probably older and more likely to fail again than a brand new road. We therefore rate even the successful patches as a way of gaining some understanding of the likely life of the remainder of the pavement in that segment



Rate Condition in accordance with IP&R Manual

Condition must match the IP&R, 2013 manual which is based on remaining service potential. Two roads with the same technical condition scores may have very different service requirements, so to ensure the rating considers service potential, the technical assessments must be supplemented by the use of other measures that take level of service into account.



Traffic Volume
School Bus Route
Heavy Vehicle Volume
Five Year Accident History
Seal Width Deficiency

Calculating the Road/Bridge Backlog

The Process – Part 2 (IP&R/Financial Component):

1. Utilise Council's current Standard Costs to calculate the cost to bring assets/segments in condition ratings 4 and 5, to a **"satisfactory" standard (BTS)**.
2. Calculate the Backlog.

Backlog = BTS, less funds allocated by Council to perform this task in current or next years budget.

3. Verification by Auditor, **including onsite ground proofing/testing.**

Council's Auditor approved the process before it was implemented as discussed with the Audit and Risk Committee. The Auditor then audited and Benchmarked Council's 2014/2015 Financial Reports, which were prepared utilising the data obtained by the application of the above process. **The Auditor provided Council with an "Unqualified" Audit Report for 2014/2015.**

Calculating the Road/Bridge Backlog

Standard Costs:

- Bitumen Road Stabilisation \$ 200,000 - \$250,000 per km
- Bitumen Road Rehabilitation \$ 250,000 - \$400,000 per km
- Convert Gravel to Bitumen \$ 250,000 - \$400,000 per km
- Bitumen Reseals – Rural \$ 3.70 per sq. metre – Urban \$ 3.90 per sq. metre
- Heavy Patching Costs \$20 - \$25 per sq. metre, these and the reseal costs are up to 25% below IPWEA National Industry Benchmarks.
- Gravel Road resheet cost (dependant on Gravel Pit location and haulage distances) of \$14,000 per km. (15% reduction on the 2009 rate). 2012/2013 RMS Regional Road Network Gravel Resheet \$26,500/km. Group 11 Council Resheeting Rates up to \$33,380/km)

Calculating the Road/Bridge Backlog

IP&R Definitions:

- Estimated Cost to Bring To Satisfactory (BTS) Standard:

“The estimated cost to bring assets to satisfactory (BTS) standard is the amount of money that is required to be spent on an asset to bring it to a satisfactory condition. This should not include any planned enhancements”. (ie BTS costs can’t include for example road or bridge upgrade costs)

“BTS should be measured against the second Condition Rating of GOOD as stated in the Integrated Planning and Reporting Manual, 2013 for Local Government”. (ie Condition 2, and not Condition 1 being New)

Source: Local Government Code of Accounting Practice 2015


Calculating the Road/Bridge Backlog

IP&R Definitions:

- Example of Cost to Bring To Satisfactory (BTS) Standard:

1. Analysis Technical Score for Sealed Road Segment
2. Technical Inspection of the Segment
3. Determination of most suitable treatment

- Routine Maintenance
- Major Maintenance
- Heavy Patch
- Heavy Patch and Bitumen Reseal
- Rehabilitation of entire segment



Each has a
different cost
implication

What does this Condition 2 definition mean ???

(Eg Treating 100m of a road segment with Heavy Patching without ripping up the entire 1,000m road segment, combined with Bitumen Resealing as opposed to a full high cost rehabilitation/renewal, Concrete Bridge Overlays, Gravel resheeting of part of a road segment eg 200m of a 1,500m segment, etc)

Calculating the Road/Bridge Backlog

IP&R Definitions:

- Council's Infrastructure Backlog:

Backlog = Assets that *“require renovation within 1 year or that are unserviceable”* to bring them back to a Condition 2, less funds allocated by Council to perform this task in current or next years budget.

\$10.1M as at 30 June, 2015 less FFF Roadmap Funding \$5.0M = Backlog of \$ 5.1M

“Aspirational service levels that the community does not want to pay for, and that do not present high residual risks, are not infrastructure backlog or financial sustainability risks” (Jeff Roorda, Local Government Training 2015).

Recognises, as discussed at the training delivered to Technical and Finance Staff by the OLG/IPWEA in Armidale in May, 2016 that Councils do not have access to unlimited funding, and the Community generally does not require and is not willing to pay for “Gold Plated Assets”.

Technical Comments

Roughness and Rutting are only two condition criteria:

- *“Roughness can provide SOME INSIGHT into the distress of a pavement, especially when considered with other condition parameters and field observations”. It is used as an “indicative investigation level” or as a trigger for an inspection to be undertaken. “Readings for short segments are usually overstated and have much less effect on ride quality”.*
- *Roughness is not a good measure of any “pavement distress” in the Urban/Town environment. It must be remembered that roughness is determined by modelling the response of a car travelling at 80 km/h. “High roughness readings at roundabouts, local streets and other low speed urban/town environments will suggest a poor ride comfort level which the travelling public, travelling at less than 80 km/h, may not truly experience”.*
- Rutting (wheel tracking) is another condition parameter. **A Road segment with a high roughness score, in the majority of cases has a high rutting score.**

Technical Comments

Indicative “Investigation levels” for Roughness:

The indicative “investigation level” (NRM) is **not the point at which a road needs rehabilitation**, but rather an indication that **there may be issues** that require technical investigation. Each individual road segment is different and the need for rehabilitation is based upon a thorough engineering assessment, which must be justified by the community’s required level of service.

Table 7.1: Levels of roughness (after Austroads 2003)

Road function	Typical maximum desirable roughness for new construction or rehabilitation (length 500 m)	Indicative investigation levels for roughness (IRI m/km)	
		Isolated areas	Length > 500 m
Freeways and other high-class facilities	1.6	4.2 95 NRM	3.5 91 NRM
Highways and main roads (100 km/h)	1.9	5.3* 140 NRM	4.2 110 NRM
Highways and main roads (< 80 km/h)	1.9	6.1 160 NRM	5.3 140 NRM
Other local sealed roads	No limits defined †	No limits defined†	No limits defined†

Source: Austroads Guide to Asset Management Part 5B: Roughness

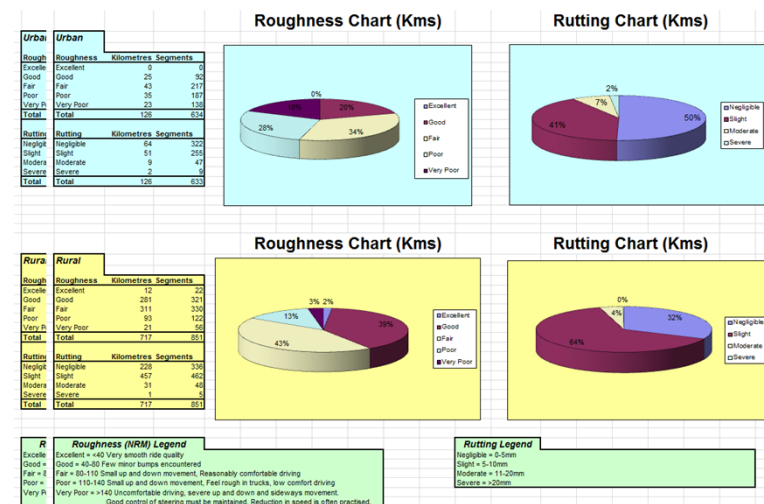
NRM= NAASRA Roughness Meter counts - a type of measurement used to determine the roughness of a road, It is expressed as the number of movements of a NAASRA Roughness Meter (approximately 15mm vertical movements) per kilometre

VicRoads aims for NRM < 140 for all Highways/Mainroads

Technical Comments

AST Raw Data Charts:

- Useful to help monitor network over the long term, and to build a database to assist long term Asset Management. Roughness and Rutting are “not definitive measures” of pavement deterioration or distress.
- Anyone interpreting the information must have a good understanding of the underlying data and its limitations.
- Anyone interpreting the data must understand the different asset classes and asset hierarchy (Code of Accounting Practice)
- Raw Data Charts alone cannot be used for rehabilitation/renewal decisions, and underlying data is only part of the State Governments IP&R Condition Rating process.



The AST Roughness “Grading Values” are not necessarily indicators of any Pavement distress, and cannot be considered in isolation to other condition factors as clearly detailed in the Austroads Manual.

AST’s Roughness “Grading values” are not “IP&R Condition Ratings”.

Technical Comments

AST Raw Data - This a part of the data underlying the summary charts. These are the highest roughness (NRM score) rural segments in the Shire (31 segments)

AST ID	Segment Type	Segment ID	RoadName	Segment Class	Segment Name	Segment Length (m)	Road Length (m)	Date Collected	Roughness	Grading Value
SR118_130	Causeway	SR118-130	Oakwood Road	Arterial	Causeway CA0303	18	13857	12072014	291	Very Poor
SR010_190	Causeway	SR010-190	Tarwoona Road	Collector	Causeway CA0647	31	35585	26062014	269	Very Poor
SR118_30	Causeway	SR118-030	Oakwood Road	Arterial	Causeway CA0299	19	13857	12072014	252	Very Poor
SR036_10	Causeway	SR036-010	Wallangra Road	Arterial	Causeway CA0484	17	21575	09072014	244	Very Poor
SR215_20	Causeway	SR215-020	Schwenkes Lane	Collector	Causeway CA0169	20	297	07072014	235	Very Poor
SR285_40	Causeway	SR285-040	Old Mill Road	Collector	Causeway CA0007	17	3743	30062014	228	Very Poor
SR215_30	Road Segment	SR215-030	Schwenkes Lane	Collector	Gilgai Creek	43	297	07072014	227	Very Poor
SR118_200	Causeway	SR118-200	Oakwood Road	Arterial	Causeway CA0305	16	13857	12072014	218	Very Poor
SR234_170	Causeway	SR234-170	Kings Plains Road	Arterial	Causeway CA0123	16	20148	09072014	217	Very Poor
SR123_20	Causeway	SR123-020	Mount Russell Road	Arterial	Causeway CA0288	13	14748	12072014	212	Very Poor
SR010_290	Causeway	SR010-290	Tarwoona Road	Collector		77	35585	26062014	211	Very Poor
SR168_30	Major Culvert	SR168-030	Michell Lane	Local	Culvert CU2938	20	6725	12072014	211	Very Poor
SR010_230	Causeway	SR010-230	Tarwoona Road	Collector	Causeway CA0648	29	35585	26062014	209	Very Poor
SR035_130	Bridge	SR035-130	Coolatai Road	Arterial	Ottleys Creek Bridge	26	13770	09072014	197	Very Poor
MR063_150	Road Segment	MR063-150	Warialda Road	Regional		199	32364	08072014	193	Very Poor
SR234_190	Causeway	SR234-190	Kings Plains Road	Arterial	Causeway CA0124	22	20148	09072014	190	Very Poor
MR462_763	Major Culvert	MR462-763	Bruxner Way	Regional	Culvert CU4344	32	104077	26062014	188	Very Poor
SR058_380	Road Segment	SR058-380	Rocky Creek Road	Collector	S.H. 16	121	121	26062014	188	Very Poor
SR032_50	Causeway	SR032-050	Coalmine Road	Collector	Causeway CA0517	26	3409	25062014	185	Very Poor
SR036_30	Causeway	SR036-030	Wallangra Road	Arterial	Causeway CA0485	32	21575	09072014	182	Very Poor
SR048_60	Major Culvert	SR048-060	Pindari Dam Road	Arterial	Culvert CU1250	40	19809	09072014	180	Very Poor
SR168_70	Causeway	SR168-070	Michell Lane	Local	Causeway CA0231	31	6725	12072014	173	Very Poor
SR036_240	Road Segment	SR036-240	Wallangra Road	Arterial	Macintyre River	122	21575	09072014	171	Very Poor
GU268_10	Road Segment	GU268-010	Unnamed A	Local		147	147	13072014	171	Very Poor
SR207_10	Road Segment	SR207-010	Browns Lane	Local	Kulkiri'	345	345	07072014	167	Very Poor
MR063_190	Road Segment	MR063-190	Warialda Road	Regional		1514	32364	08072014	165	Very Poor
SR168_50	Causeway	SR168-050	Michell Lane	Local	Causeway CA0230	25	6725	12072014	164	Very Poor
MR063_76	Bridge	MR063-076	Warialda Road	Regional	Unnamed Bridge	35	32364	08072014	164	Very Poor
SR178_30	Road Segment	SR178-030	Turrawarra Road	Local	Pine Leigh'	31	70	12072014	163	Very Poor
MR137_555	Road Segment	MR137-555	Inverell-Bonshaw Road	Regional		583		25062014	163	Very Poor
SR168_60	Road Segment	SR168-060	Michell Lane	Local	Keystone'	404	6725	12072014	163	Very Poor

Technical Comments

AST Raw Data – Data Analysed by Technical and Asset Management Staff (21 segments removed)

A		E	F	H	I	J	K	L	N	O
AST ID	Segment Type	Segment ID	RoadName	Segment Class	Segment Name	Segment Length (m)	Road Length (m)	Date Collected	Roughness	Grading Value
SR118_130	Causeway	SR118-130								
SR010_190	Causeway	SR010-190								
SR118_30	Causeway	SR118-030								
SR036_10	Causeway	SR036-010								
SR215_20	Causeway	SR215-020								
SR285_40	Causeway	SR285-040								
SR215_30	Road Segment	SR215-030								
SR118_200	Causeway	SR118-200								
SR234_170	Causeway	SR234-170								
SR123_20	Causeway	SR123-020								
SR010_290	Causeway	SR010-290								
SR168_30	Major Culvert	SR168-030								
SR010_230	Causeway	SR010-230								
SR035_130	Bridge	SR035-130								
MR063_150	Road Segment	MR063-150								
SR234_190	Causeway	SR234-190								
MR462_763	Major Culvert	MR462-763								
SR058_380	Road Segment	SR058-380								
SR032_50	Causeway	SR032-050								
SR036_30	Causeway	SR036-030								
SR048_60	Major Culvert	SR048-060								
SR168_70	Causeway	SR168-070								
SR036_240	Road Segment	SR036-240								
GU268_10	Road Segment	GU268-010								
SR207_10	Road Segment	SR207-010								
MR063_190	Road Segment	MR063-190								
SR168_50	Causeway	SR168-050								
MR063_76	Bridge	MR063-076								
SR178_30	Road Segment	SR178-030	Turrawarra Road	Local	Pine Leigh'	31	70	12072014	163	Very Poor
MR137_555	Road Segment	MR137-555	Inverell-Bonshaw Road	Regional		583		25062014	163	Very Poor
SR168_60	Road Segment	SR168-060	Michell Lane	Local	Keystone'	404	6725	12072014	163	Very Poor

ISC segments its road assets using an asset data model based on the IPWEA endorsed ADAC standard. This includes separate segments where the pavement changes, including individual segments for each Causeway, Bridge and Major Culvert. In the network wide data capture, these segments were captured along with all the other sealed segments, but the ratings given for roughness were later disregarded during the IP&R Condition assessment. It is an industry recognised fact that **roughness is not a reliable indicator of condition for these types of assets**. These segments are included in the raw data charts, and account for a large number of this sample.

Technical Comments

AST Raw Data - Data further reviewed by Technical and Asset Management Staff (6 short segments to be investigated, no action if not a risk, otherwise routine maintenance, heavy patching etc. Only a Backlog if any identified maintenance or rehabilitation required, cannot be funded)

A	B	E	F	H	I	K	L	N	O	
AST ID	Segment Type	Segment ID	RoadName	Segment Class	Segment Name	Segment Length (m)	Road Length (m)	Date Collected	Roughness	Grading Value
SR118_130	Causeway	SR118-130				18	13857	12072014	291	Very Poor
SR010_190	Causeway	SR010-190				31	35585	26062014	269	Very Poor
SR118_30	Causeway	SR118-030				19	13857	12072014	252	Very Poor
SR036_10	Causeway	SR036-010				17	21575	09072014	244	Very Poor
SR215_20	Causeway	SR215-020				20	297	07072014	235	Very Poor
SR285_40	Causeway	SR285-040				17	3743	30062014	228	Very Poor
SR215_30	Road Segment	SR215-030				43	297	07072014	227	Very Poor
SR118_200	Causeway	SR118-200				16	13857	12072014	218	Very Poor
SR234_170	Causeway	SR234-170				16	20148	09072014	217	Very Poor
SR123_20	Causeway	SR123-020				13	14748	12072014	212	Very Poor
SR010_290	Causeway	SR010-290				77	35585	26062014	211	Very Poor
SR168_30	Major Culvert	SR168-030				20	6725	12072014	211	Very Poor
SR010_230	Causeway	SR010-230				29	35585	26062014	209	Very Poor
SR035_130	Bridge	SR035-130				26	13770	09072014	197	Very Poor
MR063_150	Road Segment	MR063-150				199	32364	08072014	193	Very Poor
SR234_190	Causeway	SR234-190				22	20148	09072014	190	Very Poor
MR462_763	Major Culvert	MR462-763				32	104077	26062014	188	Very Poor
SR058_380	Road Segment	SR058-380				121	121	26062014	188	Very Poor
SR032_50	Causeway	SR032-050				26	3409	25062014	185	Very Poor
SR036_30	Causeway	SR036-030				32	21575	09072014	182	Very Poor
SR048_60	Major Culvert	SR048-060				40	19809	09072014	180	Very Poor
SR168_70	Causeway	SR168-070				31	6725	12072014	173	Very Poor
SR036_240	Road Segment	SR036-240				122	21575	09072014	171	Very Poor
GU268_10	Road Segment	GU268-010				147	147	13072014	171	Very Poor
SR207_10	Road Segment	SR207-010				345	345	07072014	167	Very Poor
MR063_190	Road Segment	MR063-190				1514	32364	08072014	165	Very Poor
SR168_50	Causeway	SR168-050				25	6725	12072014	164	Very Poor
MR063_76	Bridge	MR063-076				25	32364	08072014	164	Very Poor
SR178_30	Road Segment	SR178-030				31	70	12072014	163	Very Poor
MR137_555	Road Segment	MR137-555				583		25062014	163	Very Poor
SR168_60	Road Segment	SR168-060				404	6725	12072014	163	Very Poor

Roughness was included for all road segments in the data collection/IP&R condition assessment process, but was weighted lower for segments under 200m long, “as readings for short segments are usually overstated and have much less effect on ride quality”.

Condition Rating	Roughness	Rolling	Texture	Grading Values	Data	Charts
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Roughness was included for all road segments in the data collection/IP&R condition assessment process, but was weighted lower for segments under 200m long, *“as readings for short segments are usually overstated and have much less effect on ride quality”*.

Technical Comments

AST Raw Data - Data further analysed by Technical and Asset Management Staff (1 segment urban fringe low speed road, to be investigated, no action if not a risk, routine maintenance)

A	B	E	F		I		K	L	N	O
AST ID	Segment Type	Segment ID	RoadName	Segment Class	Segment Name	Segment Length (m)	Road Length (m)	Date Collected	Roughness	Grading Value
SR118_130	Causeway	SR118-130	Oakwood Road	Arterial	Causeway CA0303	18	13857	12072014	291	Very Poor
SR010_190	Causeway	SR010-190	Tarwoona Road	Collector	Causeway CA0647	31	35585	26062014	269	Very Poor
SR118_30	Causeway	SR118-030	Oakwood Road	Arterial	Causeway CA0299	19	13857	12072014	252	Very Poor
SR036_10	Causeway	SR036-010	Wallangra Road	Arterial	Causeway CA0484	17	21575	09072014	244	Very Poor
SR215_20	Causeway	SR215-020	Schwenkes Lane	Collector	Causeway CA0169	20	297	07072014	235	Very Poor
SR285_40	Causeway	SR285-040	Old Mill Road	Collector	Causeway CA0007	17	3743	30062014	228	Very Poor
SR215_30	Road Segment	SR215-030	Schwenkes Lane	Collector	Gilgai Creek	43	297	07072014	227	Very Poor
SR118_200	Causeway	SR118-200	Oakwood Road	Arterial	Causeway CA0305	16	13857	12072014	218	Very Poor
SR234_170	Causeway	SR234-170	Kings Plains Road	Arterial	Causeway CA0123	16	20148	09072014	217	Very Poor
SR123_20	Causeway	SR123-020	Mount Russell Road	Arterial	Causeway CA0288	13	14748	12072014	212	Very Poor
SR010_290	Causeway	SR010-290	Tarwoona Road	Collector		77	35585	26062014	211	Very Poor
SR168_30	Major Culvert	SR168-030	Michell Lane	Local	Culvert CU2938	20	6725	12072014	211	Very Poor
SR010_230	Causeway	SR010-230	Tarwoona Road	Collector	Causeway CA0648	29	35585	26062014	209	Very Poor
SR035_130	Bridge	SR035-130	Coolatai Road	Arterial	Ottleys Creek Bridge	26	13770	09072014	197	Very Poor
MR063_150	Road Segment	MR063-150	Warialda Road	Regional		199	32364	08072014	193	Very Poor
SR234_190	Causeway	SR234-190	Kings Plains Road	Arterial	Causeway CA0124	22	20148	09072014	190	Very Poor
MR462_763	Major Culvert	MR462-763	Bruxner Way	Regional	Culvert CU4344	32	104077	26062014	188	Very Poor
SR058_380	Road Segment	SR058-380	Rocky Creek							
SR032_50	Causeway	SR032-050	Coalmin							
SR036_30	Causeway	SR036-030	Wallangra							
SR048_60	Major Culvert	SR048-060	Pindari D							
SR168_70	Causeway	SR168-070	Michell Lane	Local	Causeway CA0231	24	6725	12072014	175	Very Poor
SR036_240	Road Segment	SR036-240	Wallangra Road	Arterial	Macintyre River	122	21575	09072014	171	Very Poor
GU268_10	Road Segment	GU268-010	Unnamed A	Local		147	147	13072014	171	Very Poor
SR207_10	Road Segment	SR207-010	Browns Lane	Local	Kulkiri'	345	345	07072014	167	Very Poor
MR063_190	Road Segment	MR063-190	Warialda Road	Regional		1514	32364	08072014	165	Very Poor
SR168_50	Causeway	SR168-050	Michell Lane	Local	Causeway CA0230	25	6725	12072014	164	Very Poor
MR063_76	Bridge	MR063-076	Warialda Road	Regional	Unnamed Bridge	35	32364	08072014	164	Very Poor
SR178_30	Road Segment	SR178-030	Turrawarra Road	Local	Pine Leigh'	31	70	12072014	163	Very Poor
MR137_555	Road Segment	MR137-555	Inverell-Bonshaw Road	Regional		583		25062014	163	Very Poor
SR168_60	Road Segment	SR168-060	Michell Lane	Local	Keystone'	404	6725	12072014	163	Very Poor

Browns Lane is an urban fringe rural residential access road where 95% of traffic travels at or below 32km/hr. An NRM of 167/km is highly unlikely to result in an uncomfortable ride at this very low speed.

Note: Laser is calculated to model the wheel movement that would be experienced at 80km/h

Technical Comments

AST Raw Data - Data further reviewed by Technical and Asset Management Staff - 3 segments.

AST ID	Segment Type	Segment ID	RoadName	Segment Class	Segment Name	Segment Length (m)	Road Length (m)	Date Collected	Roughness	Grading Value
SR118_130	Causeway	SR118-130	Oakwood Road	Arterial	Causeway CA0303	18	13857	12072014	291	Very Poor
SR010_190	Causeway	SR010-190	Tarwoona Road	Collector	Causeway CA0647	31	35585	26062014	269	Very Poor

Of the 31 “roughest road segments” in the “AST Raw Data”, after technical review (removal of causeways/bridges etc) **only these 3 remain, and warrant full detailed engineering investigation, due to not only their roughness rating, but also their other condition rating criteria.** Both MR137-555 and SR168-060 are programmed for rehabilitation in the 2016/2017 Program. MR063-190 received a much better overall pavement condition index due to low condition factor ratings/criteria in other areas (is an IP&R Condition 3). That said this segment has been included in the long term Road Asset renewal plan as shown in the Roads Asset Management Plan 2017-2026.

SR100_76	Causeway	SR100-076	Michell Lane	Local	Causeway CA0251	31	6725	12072014	178	Very Poor
SR036_240	Road Segment	SR036-240	Wallangra Road	Arterial	Macintyre River	122	21575	09072014	171	Very Poor
GU268_10	Road Segment	GU268-010	Unnamed A	Local		147	147	13072014	171	Very Poor
SR207_10	Road Segment	SR207-010	Browns Lane	Local	Kulkiri'	345	345	07072014	167	Very Poor
MR063_190	Road Segment	MR063-190	Warialda Road	Regional		1514	32364	08072014	165	Very Poor
SR168_50	Causeway	SR168-050	Michell Lane	Local	Causeway CA0230	25	6725	12072014	164	Very Poor
MR063_76	Bridge	MR063-076	Warialda Road	Regional	Unnamed Bridge	35	32364	08072014	164	Very Poor
SR178_30	Road Segment	SR178-030	Turrawarra Road	Local	Pine Leigh'	31	70	12072014	163	Very Poor
MR137_555	Road Segment	MR137-555	Inverell-Bonshaw Road	Regional		583		25062014	163	Very Poor
SR168_60	Road Segment	SR168-060	Michell Lane	Local	Keystone'	404	6725	12072014	163	Very Poor

Segment MR063-190 is still providing a “satisfactory” level of service at this time and there are other higher priorities

Technical Comments

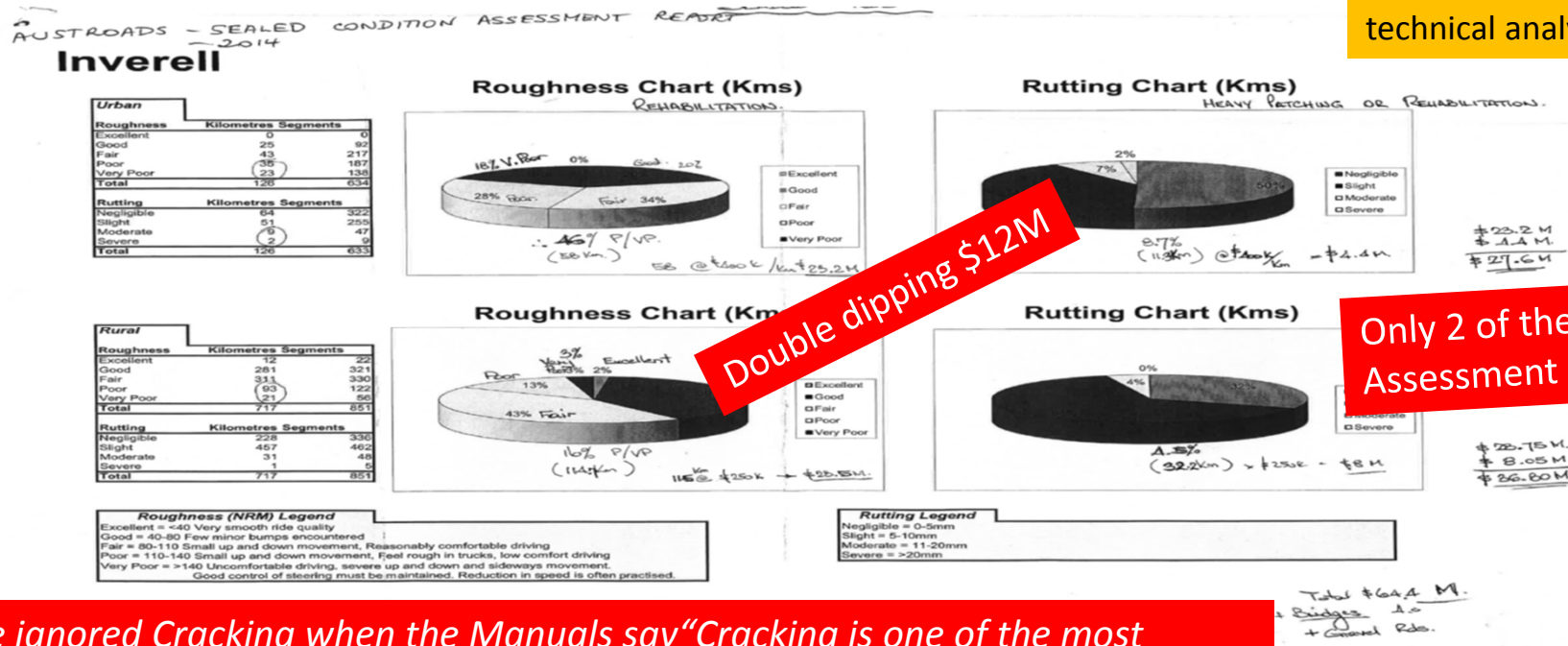
AST RAW DATA- there were a further 56 Sealed Road Segments with a Roughness NRM > 140 analysed by Technical and Asset Management Staff

- 28 Bridges/Causeways- **roughness is not a reliable indicator of condition for these types of assets**, assessed on asset appropriate criteria. (Remove)
 - 9 Short Segments - *“as readings for short segments are usually overstated and have much less effect on ride quality”*. investigate, no action if not a risk, routine maintenance/heavy patching etc
 - 3 Urban Fringe - urban fringe low speed road, to be investigated, no action if not a risk, routine maintenance/heavy patching etc
 - 16 Road Segments that warranted ***full detailed engineering investigation, due to not only their roughness rating, but also their other condition rating criteria.***
 - 8 Regional Road Segments – *full detailed engineering investigation*
 - 1 Arterial Road Segment – *full detailed engineering investigation*
 - 1 Collector Road Segment – *full detailed engineering investigation*
 - 6 Local Low Traffic Access Road segments (Tom’s Drive, Cunningham’s Lane, Airport Road etc - no heavy vehicles, not School bus routes, no accident history and no complaints – no action if not risk other than continuing routine maintenance, bitumen reseals etc)
- **Out of 87 segments with an NRM > 140, only 13 are road segments that warranted full detailed engineering investigation and consideration under BTS.**
 - **Clearly shows that if you don’t analysis the data, you make poor asset management and resource allocation decisions.**

Technical Comments

Hand written calculations provided by the Concerned Inverell Ratepayers Association (CIRA) as their “definitive evidence” of an “infrastructure backlog”. These charts were developed by Australian Surface Testing (AST) using information they gathered during the full data capture of Councils network. These charts represent a simple aggregation of the “raw laser data” and a summary of AST’s Roughness “Grading Values”. The Roughness “Grading Values” are not IP&R Condition Ratings.

RAW Data only prior to technical analysis



Have ignored Cracking when the Manuals say “Cracking is one of the most frequent forms of distress and the most significant” – ROCOND 90 & Austroads.

Calculating the Road/Bridge Backlog

CIRA's - Desktop Backlog Calculation (no on-ground technical analysis)

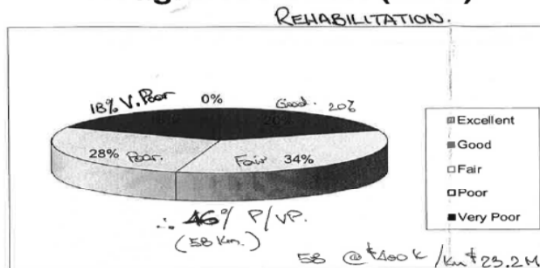
AUSTROADS - SEALED CONDITION ASSESSMENT REPORT
- 2014

Inverell

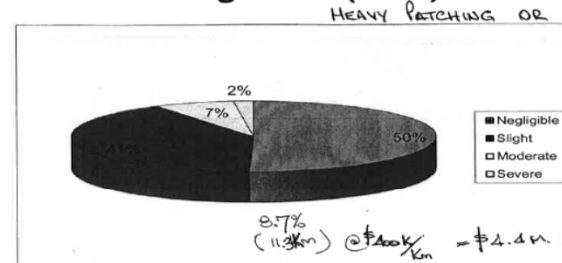
Urban		
Roughness	Kilometres	Segments
Excellent	0	0
Good	25	92
Fair	43	217
Poor	35	187
Very Poor	23	138
Total	126	634

Rutting		
	Kilometres	Segments
Negligible	64	322
Slight	51	255
Moderate	9	47
Severe	2	9
Total	126	633

Roughness Chart (Kms)



Rutting Chart (Kms)

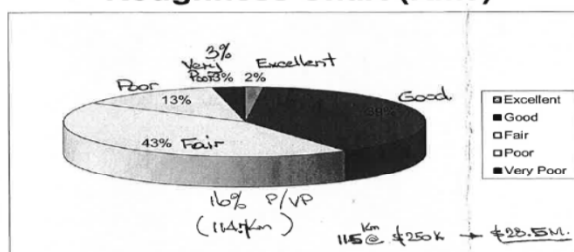


No provision for Hierarchy of Assets

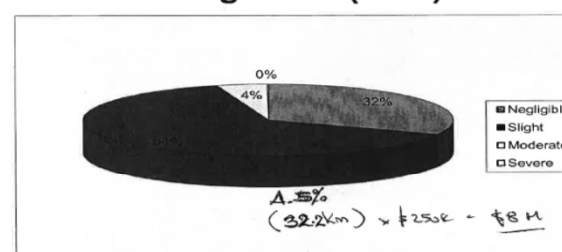
Rural		
Roughness	Kilometres	Segments
Excellent	12	22
Good	281	321
Fair	311	330
Poor	93	122
Very Poor	21	56
Total	717	851

Rutting		
	Kilometres	Segments
Negligible	228	336
Slight	457	462
Moderate	31	48
Severe	1	5
Total	717	851

Roughness Chart (Kms)



Rutting Chart (Kms)



Roughness (NRM) Legend

Excellent = <40 Very smooth ride quality
Good = 40-80 Few minor bumps encountered
Fair = 80-110 Small up and down movement, Reasonably comfortable driving
Poor = 110-140 Small up and down movement, Feel rough in trucks, low comfort driving
Very Poor = >140 Uncomfortable driving, severe up and down and sideways movement.
Good control of steering must be maintained. Reduction in speed is often practised.

Rutting Legend

Negligible = 0-5mm
Slight = 5-10mm
Moderate = 11-20mm
Severe = >20mm

AST Roughness "Grading Values", are not "IP&R Condition Ratings"

Ignores Technical Bridge Assessments

Total \$64.4 M.
+ Bridges 1.0
+ Gravel Rds.

Calculating the Road/Bridge Backlog

The Concerned Inverell Ratepayers Association (CIRA) would have you believe:

- 58km(48%) of Town Street must be renewed or \$27.6M Backlog(roughness poor indicator)
- Bridges Backlog of \$4.0M (ignored Technical assessments by ARRB that clearly indicate “no backlog”)
- Gravel Roads Backlog of \$7.2M (no calculations provided)
- 144km (20%) of Rural Sealed Roads must be renewed \$36.8M Backlog
- CIRA Backlog on these rough handwritten calculations \$75.60M, (but still talking about \$85M on their Facebook Page). **(WHAT ABOUT THE FFF FUNDING ???)**

- **These grossly incorrect results are the pitfall of misinterpreting the raw data**
- **They totally fail to recognise the reporting requirements placed on Council by the OLG, as detailed in the Integrated Planning and Reporting Manual, 2013 and the Local Government Code of Accounting Practice.**
- **Their incorrect calculations do not provide a true indicator of the on-ground condition of the assets,**
- **Raw data cannot be not used in isolation to make sound sustainable Asset Management decisions.**

Asset Conditions

Road Asset Management Plan 2017-2026

Inverell Shire Council

Example Sealed Surface Photos

The following pictures give an example of what a sealed road surface in each condition state may look like. **They are not used as a reference for rating sealed surfaces.**

Condition 3

Maintenance work required



In this state a number of defects are visible but the asset remains quite serviceable. Routine maintenance is required to remedy issues.

Condition 1

No work required (normal maintenance)



Assets in this state are in very good condition. There are no visible defects and only normal maintenance work is required.

Condition 4

Renewal work required



In this state the asset is in below average condition. There are quite a few obvious defects visible that require some renewal work to repair

Condition 2

Only minor maintenance work required



Good condition - only very minor defects visible and minor maintenance required to remedy them.

Condition 5

Urgent renewal or upgrading required.



At this stage the asset is in very poor condition

Asset Conditions

Rivendell Road - Segment 10 (Rural Road - Services 3 residences, note driveways, old rail line formation 10/06/2016)



Concerned Inverell Ratepayers Association Assessment = Condition 4 being “Poor” ie. Backlog and must be renewed within 1 Year

Asset Conditions

Taylor Avenue - Segment 10 (Rural Road - Services Boss Engineering and 3 residences, note driveways and old rail line formation 10/06/2016)



138 NRM – AST Grading
Value = “Poor”

Council IP&R
Condition Rating is 2
– Good Condition

Concerned Inverell Ratepayers Association Assessment = Condition 4 being “Poor” ie. Backlog and must be renewed within 1 Year

Asset Conditions

Wood Street - Segment 80 (50km/h zone, note Intersections 10/06/2016)



Concerned Inverell Ratepayers Association Assessment = Condition 5 being “Very Poor” ie. Backlog and must be renewed immediately

Asset Conditions

Lindsay Avenue - Segment 40 (Short 100m segment, 50km/h zone, note services, no through road 10/06/2016)



Concerned Inverell Ratepayers Association Assessment = Condition 5 being “Very Poor”
ie. Backlog and must be renewed immediately

Asset Conditions

Greaves Street - Segment 50, part of the Street (50km/h zone, note Intersections 10/06/2016)



Concerned Inverell Ratepayers Association Assessment = Condition 5 being “Very Poor”
ie. Backlog and must be renewed immediately

FFF, Backlog and Equitable Funding Issues

Fit for the Future Roadmap Requirements < 2.0% by 2020:

- Council, **IPART Approved FFF Roadmap** requires running down Council's surplus equity and only then a **14.25% SRV phased in over 3 years** (figures are total extra payable in 2020).

COUNCIL ADOPTED AND IPART APPROVED FFF ROADMAP – 14.25% SRV

- Inverell Residential - \$2.50 per week or \$131 per year average;
- Village Resident - \$1.25 per week or \$65 per year average;
- Farmland Ratepayer - \$6.91 per week or \$359.49 per year average; and
- Business Ratepayer - \$12.83 per week or \$667.19 per year average.

Region average SRV 27.09%
Gwydir Shire 30%
Residential \$ 190 p.a.
Business \$ 456 p.a.
Farmland \$1,458 p.a.

EXISTING SERVICE LEVELS MAINTAINED AND ENHANCED FROM 2020

(Largest Rural Ratepayers Rates increase by \$5,215 p.a.)

- If you believe CIRA's \$85M Backlog Model, then the following **“unaffordable and unwarranted” 279.25% Rate Increase is required** from 2017/2018 (figures are total extra payable from 2017).

CONCERNED INVERELL RATEPAYERS ASSOCIATION MODEL – 279.25% SRV

- Inverell Residential - \$50.37 per week or \$2,619.37 per year average;
- Village Resident - \$24.48 per week or \$1,273.38 per year average;
- Farmland Ratepayer - \$137.80 per week or \$7,165.56 per year average; and
- Business Ratepayer - \$254.49 per week or \$13,233.66 per year average.

(Largest Rural Ratepayers Rates increase by \$102,206 p.a.)

**It is not an option to say
“you just need to get more
State or Federal
Government money”.
“Councils must
independantly meet the FFF
Benchmarks by 2020”**

Effectively and Efficiently Managing the Communities Assets

Good Governance and Transparency:

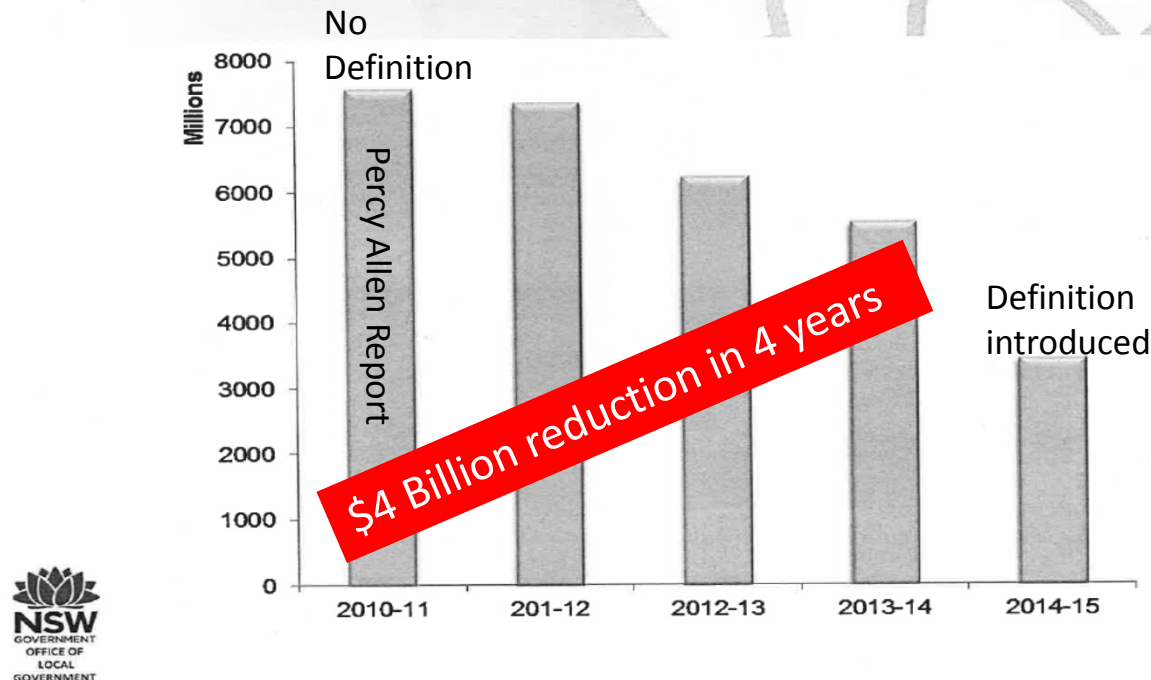
Road and TCRP Issues dealt with Confidential Committee (ie Closed to the Public) at Council meetings, Civil and Environment Services meetings or Economic and Community Sustainability Committee meetings:

- A review of Council's Business papers during this current term of Council, from September, 2012 will **clearly show that no Council Road or TCRP matter has been discussed in "Confidential Committee"**. All the matters have been discussed in open Council and in the open Committee meetings, ensuring accountability and transparency. (This can be verified by reviewing Council's business papers which are available on Council's Website).
- Despite all the information that Council has available at this time, being published in the Business Papers, CIRA continue to incorrectly state a CBD Renewal cost of \$15.5M on their Facebook Page. (CIRA Facebook 3 June, 2016).

Benchmarking the Road/Bridge Backlog

NSW Councils Total Backlog – All Asset Classes:

Bring to satisfactory standard



It doesn't matter what we may think !!!
The State Government specifies the requirements that Council must comply with.

No Audit for 2015/2016.
Industry Working Group Recommendation 2016 – Removal of BTS/Backlog From SS7

Source: Office of Local Government/IPWEA NSW Special Schedule 7, Implementation of Infrastructure Assets as at 30 June, 2016 – Workshop Training Manual May-June, 2016 (Council's Technical, Asset Management and Finance staff have attended many such events).

Benchmarking the Road/Bridge Backlog

Local Region:

TABLE: Regional Councils Financial Assessments in \$'000s - 2014-15

New England Councils	Recurrent Road Funding Available \$'000s	Estimated Annual Maintenance Required \$'000s	Actual Annual Maintenance \$'000s	Maintenance Shortfall \$'000s	Infrastructure Backlog \$'000s
Armidale	3,960	3,932	3,681	-251	11,036
Glen Innes	3,592	1,343	1,853	510	17,904
Gunnedah	4,161	2,785	2,785	0	7,404
Guyra	3,171	1,421	1,522	101	4,325
Gwydir	6,141	3,669	3,669	0	13,896
Inverell	7,611	4,535	4,548	13	5,097
Liverpool Plains	4,984	3,565	5,867	2,302	5,597
Moree Plains	8,415	5,165	4,639	-526	7,521
Narrabri	6,354	5,178	6,150	972	8,925
Tamworth	11,987	11,553	11,709	156	20,063
Tenterfield	5,445	2,405	2,792	387	11,148
Uralla	3,278	2,583	2,550	-33	533
Walcha	2,914	1,326	1,399	73	16,407
New England	72,014	49,460	53,164	3,704	\$129,856

- The NRMA published their “Funding Local Roads 2015” Report. The report analyses the Infrastructure Backlogs of all NSW Councils. The report highlights *“Councils this year reported repairs of \$1.7 billion down from \$3.2 billion last year on the back of strict reporting requirements under the State Governments Fit for the Future reforms”*. The reported Infrastructure Backlog for Clarence Valley Council for example has decreased from \$224M to \$29M (87% decrease).
- The Auditor Benchmarks Council’s performance and practices against the 15 other Councils they Audit.

Benchmarking the Road/Bridge Backlog

Local Region - Heavy Transport Operators:

- Council is currently undertaking a Shire wide Road Study to better understand the freight movements within the Shire, to ensure the optimal allocation of its limited Road Funding.
- This involves direct discussions with the major freight company's operating in the Shire and large businesses such as Bindaree Beef.
- Information provided to date has confirmed that after the Gwydir Highway, MR187 and MR137 are the major freight corridors. This confirms Council's significant rehabilitation and upgrade program for these roads.

And yet CIRA are openly critical of Council's current \$30M FFF Road Asset Maintenance, Renewal and Upgrade Program. This demonstrates a very clear lack of understanding of sound sustainable Asset Management, the State Governments "Fit for the Future" requirements and the growth needs of the Shire.

Managing Council's Road Asset needs

FFF Roadmap - Road Asset Program 2015/2016 and 2016/2017:

RURAL ROADS: (32% of Rates) (\$6,747,170)	Rehabilitation/Heavy Patching	\$ 6,126,910	<i>"Largest ever Program"</i>
	Bitumen Reseals	\$ 3,896,097	
	Bridges/Culverts/Causeways	\$ 1,528,000	
	Gravel Resheeting	\$ 3,710,040	
	New Bitumen Seals	\$ 700,000	
	Maintenance	\$ 7,707,377	
TOTAL		\$23,668,424	RURAL - 80% (350% ROI)
TOWN /VILLAGE STREETS (68% of Rates) (\$14,271,270)	Rehabilitation/Renewal	\$ 1,192,279	
	Bitumen Reseals	\$ 397,938	
	Drainage	\$ 648,000 (stormwater levy \$258K)	
	<i>CBD Renewal/TCRP</i>	<i>\$ 489,721 (1.6%)</i>	
	New Cycleways \$ for \$	\$ 220,400	
	New Bitumen	\$ 560,000	
	Maintenance	\$ 2,497,265	
TOTAL		\$ 6,005,603	TOWN/VILLAGES - 20%
		\$29,674,027	100%

(The Core CBD Businesses contribute 12% or \$2.5M of the Rates. Normal Year Road Spend \$9.0 - \$9.5M)

Managing Council's Road Asset needs

FFF Roadmap - Road Asset Program 2015/2016 and 2016/2017:

Council continues to lobby the State and Federal Government seeking additional Roads and Transport Infrastructure Funding and submit Grant applications. **Additional Grant Funding in 2015/2016 and 2016/2017:**

- Roads to Recovery \$ 3.11M (\$2.1M Graman to Wallangra)
- Blackspot Programs \$ 0.32M (Rural Roads)
- Bridge Renewal Programs \$ 0.80M (Tintot Bridge)
- Regional Roads Repair Program \$ 0.64M (MR187,MR063,MR137 ongoing)
- Fisheries NSW Grant Program \$ 0.20M (Auburnvale Road)
- Bikepaths and Cycleways \$ 0.37M (Town Area)

TOTAL \$5.44M

- Ongoing applications to the “Fixing Country Roads” (State) and the National Heavy Vehicle Productivity (Federal) Programs

Council's Fit for the Future Roadmap provides for substantial additional funding allocations to the Rural Road Network on a continuing basis.

Effectively and Efficiently Managing the Communities Assets

Quality of Council's Asset Management:

"I must congratulate Council firstly. Overall, your buildings and other structures are in very good shape and frankly, would be the envy of the majority of Councils across Australia. Indeed we have not come across a Council that has managed their facilities so well in the past six years of doing these building condition assessments. Council's prudent management approach is certainly providing a sustainable portfolio of facilities to support the services that Council is providing into the foreseeable future".

Owen Harvey - Regional Manager Queensland 31 May,2016

