

NATIONAL INFRASTRUCTURE SUMMIT

Building the Foundation, better positioning municipalities for the 21st Century
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THE ROAD AHEAD:

Why and how Asset Management can help you move faster with more confidence *and why it is not enough*

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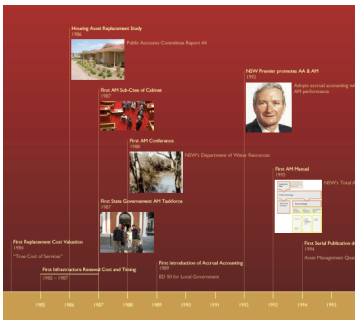
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I came to this Summit with a prepared presentation - of course! But this Summit has already changed my mind and I hope that you feel the same way. As a result I have rewritten what I wish to say to you.

My message to you in brief is that Asset Management is essential - but it is not enough.

I am going to tell you why you absolutely need it. And I am going to tell you why you need to go further.

Introduction



18 months ago I decided to put together, as best as I could, the story of how asset management has developed over the past 30 years. Here is the first timeline I have produced. I am now working on a timeline for Canada and if there is any in the audience who would like to contribute to this, please go to my website www.amqi.com and contribute your ideas.

When I started, I wanted to know why asset management had developed differently in different jurisdictions, why in some places the charge had been led by finance and in others by engineering, why some technique were being well used in some places but were completely unknown in others.

But one thing, above all else, concerned me. Why was it, I wondered, that agencies would so often progress to the stage of being the envy of all in terms of their asset management - only to collapse and have to rediscover everything they previously knew. Was there something inherently unstable about asset management?

I haven't yet found the answers to all my questions, but I am pretty sure that I know the answer to that last one. And, when *you* know it, you can make sure that it doesn't happen to you.

Why we absolutely must have good asset management

But let's start at the beginning. You are going to come across a lot of definitions of asset management. Maybe you already have. All have validity. But the one that I favour at the moment has a focus *not* on what asset management *does* - but what *you get out of it!*

Asset management is a series of **process and information improvements** that enable you to see not only the likely **consequences** of the decisions you take today - *but also of the actions you don't take.*

When you are armed with a knowledge of the consequences you can make better decisions. For example, you may not have enough money to do everything, but you can be confident that the things you are doing are of greater value to your community than the things you are not - and, importantly, you can demonstrate this to others.

Asset management protects you. If you are a councillor, it protects you from pressure by lobbyists and those who would have you spend council resources in ways which you know are sub-optimal. If you are an administrator, it enables you weigh up different uses of your limited resources. If you are responsible for assets, it enables you to know what to do that will best meet the service needs of the community.

The key word is '**consequences**'.

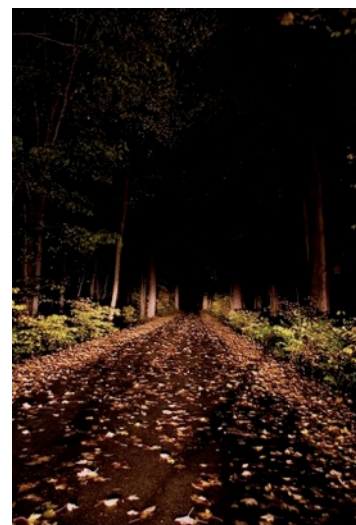
When you can tell what is likely to happen next as a result of the actions you take today - and of your inactions - you are able to make better decisions and make them with confidence. And when you are able to demonstrate this to others and gain *their confidence*, life becomes much more enjoyable.

Driving in the Dark

Without asset management, you are operating in the dark.

It's like driving at night with your headlights showing you just a few metres of the coming road.

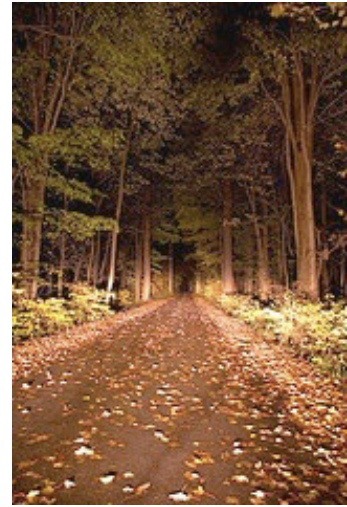
You are only able to see a little way ahead, and all of your decision making, whether on short or long term goals, is constrained by having such a limited view. So you move cautiously, never quite sure what those shadows mean, or what is coming next. And you can easily miss your turning and have to make time wasting course corrections. Or at worse, run into something with expensive, maybe fatal, results.



Introducing asset management is like switching on your high beam.

Suddenly, with a better view of the likely consequences of your actions, you can now see a long distance in front. You can move forward more confidently, make better decisions, and avoid potential problems, because you understand the likely consequences of actions and inaction.

This is very exciting and it is not difficult to see why asset management creates evangelists. Many of you will have experienced this in your recent exercise to complete asset data bases in order to comply with PS 3150. Maybe for the first time, you now have an overall view of your asset base, a better understanding of what you have, what condition it is in, and what its value is. This gives you a completely different view of what you can do - and it is pretty heady stuff.



But a word of caution!

What I have learnt is that when you reach this stage, you must not stop. *The High Beam stage is unstable.* When you are on the road, any approaching vehicle can force you to switch them off.

Similarly when you are starting asset management, and you adopt generic assumptions about asset lives and desired service levels to get yourselves started, you get a 'great leap forward'. This is the 'switching on the high beams' stage. It enables you to make progress quickly.

But, as in all things, easy come - easy go!

When things get tough - the asset management equivalent of the oncoming traffic - you can no longer rely on these generic assumptions and service levels. In times of trouble - missed grants, unexpected and unfunded asset renewals, in fact any difficulty - your staff and your ratepayers need to have full confidence in the reliability of your system and this means that you need to move on from the generic data and develop information that is credibly yours. In other words, you need to customise, to make the service levels and associated asset lives your own.

To do this you need to work with your community to develop service levels that are widely understood and accepted and from which you develop costs and standards that can withstand criticisms.

Your asset data needs to reflect these service levels and to demonstrate the reliability that comes from documented, efficient, update mechanisms. Your asset lives need to reflect your own local conditions and known maintenance histories. And you need robust processes to ensure that all new asset acquisition reflects your strategic directions.

This takes effort, commitment - and time.

However, once you have done this, you are largely failure proof. By the time you have developed a good understanding throughout your council staff from field staff to CEO and councillors, by the time you have good, up-to-date data, and by the time you have the confidence that this brings, your asset management is secure. You have successfully navigated the instability phase and come out safely on the other side.

This stage of asset management is like adopting a Satellite Navigation System. Now you can analyse all the options and choosing the optimum course is easy.

And when you get here you won't want to stop. Asset management improvement for the benefit of your community will simply be the way you do business and you will enjoy always seeking to do better. The Road Ahead is now clearer and you travel it with confidence.



But what happens if you don't choose the asset management route?

Let me tell you a story about a certain council in New South Wales.

In June 2007, during a wild storm, a section of the road collapsed causing a vehicle with 5 people to plunge into the flooded creek below, a mother, a father, their two children and another woman, a family friend. They all died.

The cause turned out to be an unlined culvert that had given way.

In the subsequent coroner's investigation it was revealed that:

- The council had been aware of the problem with the road as early as 2002 and had prepared an estimate to reconstruct the entire culvert but that details were never entered into the record management system.
- In 2004, pavement repairs triggered a request by the council's asset manager to ask for quotes for concrete lining of the culvert with tenders called. But again, the information was not entered into the record system and no follow-up action was taken.
- Emails with quotes for roadwork that may have averted the collapse were not considered official records and were not recorded.
- A key finding of the review was 'that at the time of the road collapse council's inadequate reporting practices led to a failure to identify the critical need to upgrade some of its key road infrastructure'

Internet comment on the report of the accident:

"Too little too late. Good to see our rate money going towards incompetent council workers who hide behind their computers pretending to be busy. And when the accident did happen they actually had the nerve to try to pass the blame to the state / federal government. This accident should not have happened. For the lazy workers who didn't do their job properly, how do you sleep at night?"

Is it a case of 'lazy workers' or did the system fail them? Unless your system is sound, how would you know? More especially how can they demonstrate their diligence to the outside world?

A poor asset management system puts your staff at risk.

The Central Coast's 'Express Advocate' reported the mother of the young woman whose family perished as saying that she hoped the people who made the human error think about it every night. 'We certainly do. They have destroyed our family'.

No member of your staff should have to live with this responsibility!

And, although reported as 'human error', if you look at the numbers of different people involved in this story, you have to ask yourself whether it is really 'human error' or really 'system error'.

Now the Coroner's report was, not unnaturally, reported in both of the local papers. It was noteworthy for two reasons: One: because both journalists actually used the term 'asset management' in their reports, and Two: because both reported that whilst asset management in the council was now best practice it was not at the time of the accident.

I was curious.

What had happened to improve asset management so much between the accident in June 2007 and the Coroners Report in March 2009? (less than 2 years) And what was it that impressed the journalists so much that they both reported that the council was now 'best practice' in asset management.

I decided to visit the council and find out.

And when I walked into the foyer, on the wall facing the entrance was their 'mission statement'. It said simply

"We aim to be a council that the community is proud of"

and underneath it said

"We are not there yet!"

That told me a lot about the attitude of that council and their determination to get better.

Then I met with the Asset Manager and his Director of Information Services. Both were extremely open, articulate, knowledgeable - and very enthusiastic about asset management. They knew they had to improve their asset information and had taken serious steps in this direction.

But they also knew that improving asset information *alone* is not enough. They knew they also had to understand and improve their **processes**.

And this is where they really shone. Each of their structures and processes had been analysed and streamlined. There were dozens of them, each reproduced in A3 size - and laminated, indicating that these were for constant use. They were bound in sections relating to different functions. In the appendix are some of their charts and process maps.

Mapping is a great way to understand your processes - **and a great way to show others that you understand them!** My guess is that it is these graphics that so impressed the journalists.

Taken together

Greatly improved information

A positive, action-oriented, attitude - as expressed by the foyer plaque and the confidence and knowledge of the Asset Manager and his Director of Information Services

Understanding of Asset Management Processes - as illustrated by the process maps,

...all added up to a situation where two journalists from separate papers, in reporting the story of council failure, would both modify their criticism by making it clear to their readers that the council's asset management was now 'best practice'.

But there was an even better result.

After the coroner's findings had been handed down with all the attendant publicity, the Sydney Morning Herald reported on yet another culvert in poor condition in the council area. In ordinary circumstances you would expect the press to have a field day with this.



But it didn't. Despite the obvious cracks and poor condition of the culvert, the Sydney Morning Herald's journalist provided very balanced and moderate coverage. He quoted the consulting engineer's findings, made some criticisms of the council but then tempered the report with the recognition that the cost to repair the problem was high relative to the annual budget; actually quoted figures, and comment by other councils about this problem and recognised that a large part of the problem was that the roads were handed over to councils by the State Government, who had previously had responsibility for them, with insufficient maintenance funds attached.

What price would you pay for fair media coverage?

Oh, and by the way, last week I rang the Director of Asset Information to ask him to send me some of his process maps so that I could share them with you, which he did. I also asked him if he would go into the foyer and take a photo of the plaque for you. But he said that the foyer display had now been completely remodelled to feature the council's new 2015 Vision.

It is what I said to you earlier - **once you get good at asset management, it becomes a way of life and you just want to keep getting better!**

Now while asset management - good information, good knowledge of your processes, and a good attitude - are essential, they are not enough.

We need to go beyond Asset Management

I predict that in the future this Infrastructure Summit, with its focus on innovation, will be seen as a defining moment in the history of infrastructure asset management. A time when we changed direction and, by doing so, saved our communities.

The proposition I have for you is a simple one. *What we are currently doing is not working.* A speaker yesterday observed that we have been talking about the Infrastructure Deficit for many years, perhaps decades. And that is what we have been doing - *talking* about it.

But what have we been *doing* about it?

In a few very advanced councils, there has been recognition of the increasing costs of replacing our ageing assets, particularly for water pipes and sewer mains and action has been taken to raise rates in order to provide for a renewal fund.

But even these very advanced councils are now realising that seeking to address the infrastructure deficit by increasing funding levels is an impossible task. They may be able to tackle their water pipes and sewer mains by this method, but what about their roads, bridges, parks and buildings? Taken all together, the task is just too big.

It is not difficult to see why.

Your assets are wearing out at the rate of 2%, perhaps a little more. In other words, the average life of all of your assets is not more than about 50 years. Yes, the water pipes and sewer mains may have a life of over 100 years (or not, in some cases) and the road pavements may have very long lives - but against this are the shorter lives of road surfaces, plant and machinery, building fit-outs, and all of today's increasing store of computerised equipment.

I spoke earlier this week with a young asset manager who explained that his council had elected to put aside \$400,000 a year towards renewal of assets but that an election was coming up soon and he was not at all sure, once the election was over, that the new council would be prepared to continue this level of funding. I asked him about the size of his asset portfolio and he told me 1.19 billion - over 1,000 million! And he was concerned about sustaining a renewal fund of *less than half a million!*

He also said that his council had a annual capital budget of about 2 million. So how had the portfolio of this small council ever got to this size?

One answer is that. in the past, many assets have been 'gifted' - from developers and from the provincial and federal levels of government. This year, his capital grants were \$16 M, 8 times his council's own capital budget.

Some of his \$1.19 billion may well be land assets, which of course do not need renewal and do not feature in the renewal need. Against this, we need to consider that assets will almost always cost more to renew than they cost in the first instance, because we now need to take into account more stringent standards for occupational health and safety and environmental protection.

These problems will also apply to you.

What is the total replacement cost of your infrastructure assets? Are you prepared to put aside 2% of this amount every year in preparation for renewal?

If we are honest - and we do need to be honest - we know that this is never going to happen. We are never going to be able to, or willing to, fund the entire amount required for the renewal of our existing asset portfolios.

And yet the size of our portfolios continues to grow. So the size of funding problem continues to grow. And our infrastructure continues to degrade.

What's the solution?

Well, when all the outcomes of the game point to annihilation, there is only **ONE** solution. We have - as in the movie "*War Games*" - **to refuse to play the game.**

Or rather we need to **CHANGE** the game.

If we cannot, or will not, pay to continue our infrastructure the way it is now, we either learn to do without infrastructure - which is inconceivable - or we seek alternatives that we can afford.

Which is the theme of this Summit - Innovation!

We clearly need to make some changes. I suggest we start with **THREE.**

First, we must stop looking at the infrastructure deficit as a funding problem. It isn't. It isn't a lack of money, it is more a lack of imagination. With all due deference to innovative infrastructure funding, we need to do more than produce the same types of infrastructure with **different funding** sources - we need to develop **different infrastructure.**

Our asset management information tell us *when* our existing assets are due for renewal, and *how much* that renewal would cost (at today's prices) if we were to replace that infrastructure with the same kind as we have now.

When we see that an asset is due for renewal in 20 years has a replacement cost of \$200 million, it has been common to think of this as a need to find \$200m in replacement funding.

A different way of looking

I would like to suggest to you that we have been looking at this information in a one-sided manner, focussing on the cost. What if, instead, we focussed on the time period - the 20 years - and the idea *this planning period is an opportunity* that we have to come up with an alternative to our existing infrastructure - and that, should we fail - *the penalty is \$200 million*.

Second, we need to stop thinking about infrastructure as a **cost** - and start thinking about it as **value**.

New developments nearly always impose a cost on existing residents who end up paying for community growth. But what if, when developers come to you with a proposition for a new development, they are required to demonstrate how revenues from that development will pay for the life cycle costs? Is it possible to establish developments like this. Yes! And it has already been done - here in Canada.

Moreover all infrastructure needs to be thought of in this way - producing value rather than cost.

In the Innovations Session here at the Infrastructure Summit, Patrick Lucey argued that with the infrastructure we have today, we only get to use something like 5-25% of all of the energy we produce, the rest is lost in transmission. What if we could produce energy locally and get 100% of the energy produced? What if by treating wastewater on site, we could extract energy and reduce the amount we need to produce? And by recycling water, reduce the amount of water needed overall? These closed loop systems can be introduced by innovative design. And this is not futuristic dreaming. It has already been done - and, again, done here in Canada. These solutions are ideal for large cities and for new cities.

For smaller rural and dispersed communities, Wade Nutter demonstrated that local land based water treatment can reduce energy and chemical costs, and by using the soil as a living filter, replaces the need for alternative infrastructure. Moreover it doesn't require large centralised infrastructure and so reduces the costs of piping. It can also generate revenues if used to grow trees. Again an ecological and economic solution. All it requires is to plan ahead!

Kees Nelissen suggested an innovative infrastructure solution that greatly reduces council operating costs. In Holland they use a system of modular intersecting blocks to form their sidewalks and lay down their infrastructure under these sidewalks. When repairs are needed, it is a matter of only a few hours to lift these blocks, attend to the repairs and then replace their blocks. Compare that with the days of effort in drilling and then reconstructing solid structure sidewalks. Even when eventual renewal is needed, only about 20% of the blocks need replacement, a saving of 80%!

These are just a few of the innovative ideas that can reduce infrastructure costs to a fraction of what we are experiencing today. We need to focus on discovering more!

The Third thing we need to do is to stop thinking of Asset Replacement and start thinking what function or service is really needed and then look for different ways of providing it.

The Infrastructure Deficit is measured by the cost of *doing things the way we have always done them*.

So I ask you, what if we don't? What if we do things differently, using the innovative suggestions I have outlined here, and more?

The longer we focus on *funding*, doing things the way we always have, the greater the chance that we will eventually have to do just that. When we demand more funding from others to address renewal, we are admitting that we do not have the intelligence to find non-funding solutions, management solutions, good design solutions.

But we *can choose now* to do things differently - not just fund and finance differently, although that is necessary; and not just manage things differently, and that is necessary, too. But rather funding and managing very different types of infrastructure. Infrastructure that is more environmentally friendly and more economic. And Infrastructure that produces revenue rather than costs. When we do that, we are not only environmentally sustainable but financially sustainable too.

As one commentator said at the Innovations Session: "We usually think of innovation as costing money but really it is just about putting things together differently so that they save money." And he is entirely right.

But being creative can also mean creating services that we haven't even dreamt of yet, and doing it at a cost we can afford.

Think iPad. The iPad could never have been created as a replacement for an existing asset. It could never have been created as a new way of providing an existing service. The iPad creates a new asset AND an entirely new service. But it is based on the iPhone which was based on earlier mobile phones. Innovative doesn't mean entirely new. Innovative means putting existing good (and proven) ideas together differently.

I would like therefore to leave you with the idea that whilst Innovative Asset Management is necessary for you, it is no longer enough. Innovative Financing Solutions, as explored this morning are also necessary, but they are also not enough. The Infrastructure Deficit is just too large! So we absolutely need Innovative Design Ideas.

Each of us can do small marginal things and we should. But don't think that will ever solve the Infrastructure Deficit. As a group we need to think further.

We need to think i-Infrastructure. Putting what we know together to get an outcome that is entirely new - and, well, innovative!

If we go from here to work collaboratively to produce these new designs - infrastructure that produces value rather than cost, infrastructure that is both environmentally and financially sustainable - then I think we have a good chance that in the future people will look back at this Infrastructure Summit and recognise it as the beginning of a new phase in infrastructure - the phase of Innovative Infrastructure Leadership.

I wish you well!

Penny Burns

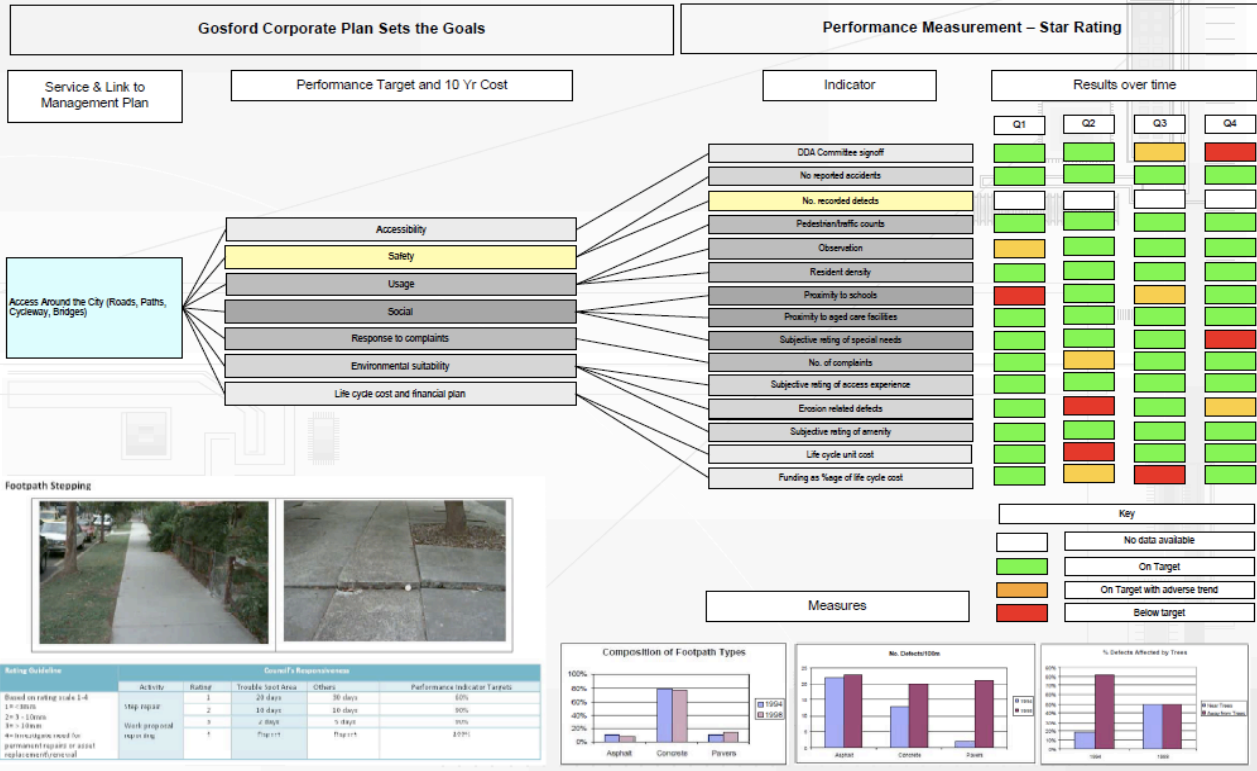
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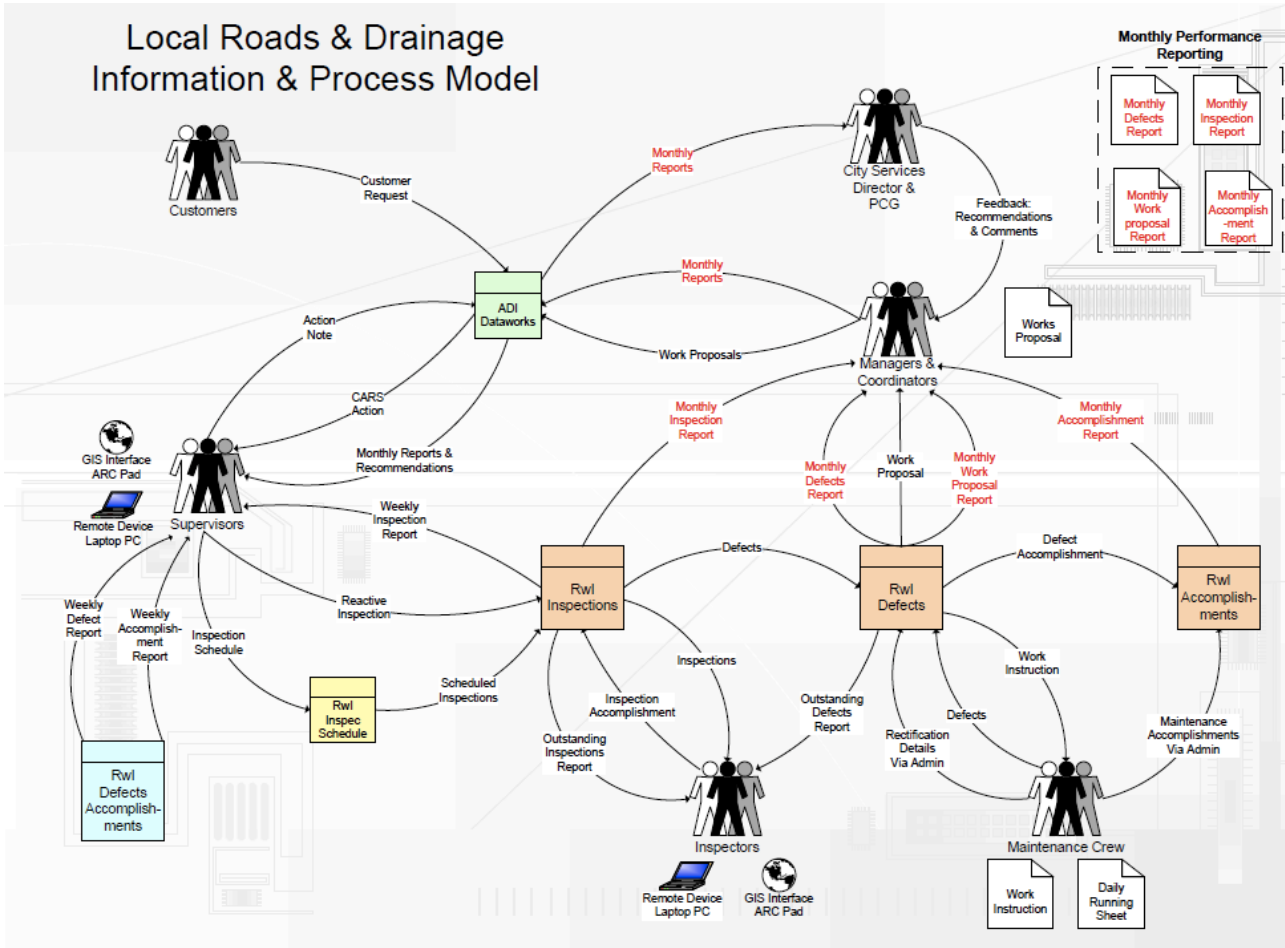
Note: I would be more than happy to converse with any of you who would like to develop these ideas. Please email me.

APPENDIX - Examples of process mapping and structural mapping

Service Planning Framework



Local Roads & Drainage Information & Process Model



Asset Class	Pro-active Scheduled Asset Inspection Frequency*
Pits	Once per year
Pipes	Based on reported or noted deficiencies
Table drain	Co-ordinated with roads area maintenance inspections every 4 months.
Prescribed Dams(Ret basins)	Twice per year
Levee Banks*	Twice per year
uPIS	By contract based on recommended frequency
Culverts	Once per year for routine inspections and once every five years RTA major culvert inspections
Frocks	As per individual Maintenance Management Plan
Infiltration Devices	

Pit Blockage

Rating Guide/line	Activity	Rating	Trouble Spot Area	Priority	Performance Indicator Targets
Based on rating scale 1-4 1= clear 2=80% blocked 3= 50% blocked 4= extensive failure, refer to engineering consultants	Clean Pits and weirs	3	10 days	As per program	65%
		2	12 months	24 months	80%

Road Pavement Deficiency

Rating	Activity	Rating	Service Level					Performance Indicator Targets
			A	B	C	D	E	
1= no defect 2= minor surface, area less than 5,000 and less than 50 mm deep. 3= area greater than 5,000 and/or 50mm deep 4= very large areas- signs, depth, system, low area on steep bank, stored up, in high speed zones	1= no blocking 2= fix 3= fix 4= no report immediately to Manager to Manager	1 2 3 4	1 hour to make safe and 2 days to repair	2 hours to make safe and 2 days to repair	4 hours to make safe and 2 days to repair	8 hours to make safe and 2 days to repair	8 hours to make safe and 2 days to repair	70% 70% 70% 80%

Deformation (Rutting, Shoving, Depression)

Extent
 Area Affecting upto 10% of roadway area Rating 1
 Deformation affecting 10% - 35% of roadway area 2
 Deformation affecting 35%-65% of roadway area 3
 Deformation affecting > 65% of roadway area 4

Severity
 Moderate - upto 20mm depth
 Extensive - greater than 20mm depth

Deformation Occurrence
 1 - Defects observed are localised.
 2 - Defects observed are scattered.
 3 - Defects observed are at an intersection/cul-de-sac bowl.

Example

Total the area of rutting, shoving, depression and/or corrugation defects for the road segment = $3 \times 1 \times 1 + 3 \times 1 \times 1 + 3 \times 1 \times 1 + 3 \times 1 \times 2 = 27 \text{ m}^2$
 Roadway segment area = $100 \times 6 = 600 \text{ m}^2$
 Extent of segment area affected = $(27 / 600) \times 100 = 4.5\%$
 Looking at the extent table on the left, 4.5% falls into rating 1 for this segment.

Surface Texture (Stripping, Ravelling, Polishing, Bleeding, Delamination)

Extent
 Area Affecting upto 10% of roadway area Rating 1
 Texture affecting 10% - 35% of roadway area 2
 Texture affecting 35%-65% of roadway area 3
 Texture affecting > 65% of roadway area 4

Severity
 Moderate - small pockets of failure
 Extensive - large pockets of failure

Example

Total the area of delamination, polishing, ravelling, bleeding and/or stripping defects for the road segment = $1.5 \times 3 \times 1 + 0.5 \times 3 \times 1 + 1.5 \times 3 \times 3 + 1.5 \times 3 \times 2 = 21.9 \text{ m}^2$
 Roadway segment area = $100 \times 6 = 600 \text{ m}^2$
 Extent of segment area affected = $(21.9 / 600) \times 100 = 3.6\%$
 Looking at the extent table on the left, 3.6% falls into rating 1 for this segment.