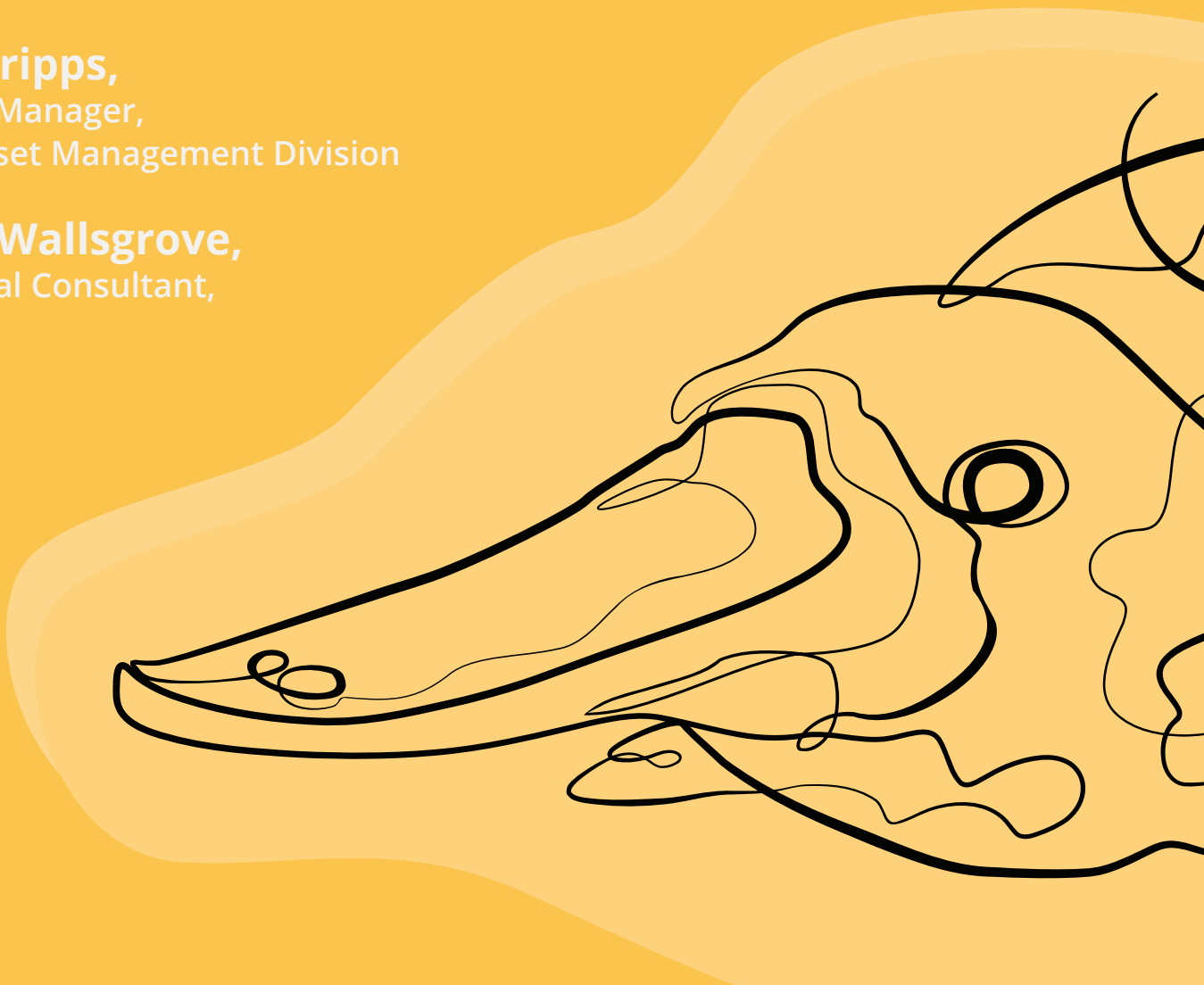


Building an Asset Management Team

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About this guide

This is intended as a practical guide for any agency interested improving overall Asset Management, or someone appointed by senior leadership to build or expand on an AM function. It is our response to common questions around staffing to perform the functions and competencies required to support an effective Asset Management system.

We assume you already know what AM is and why it's useful. We start from the assumption good AM is a strategic business capability for an asset-intensive business, not simply something done for regulatory purposes or to check some box.

The challenge for US Transit Agencies, and other sectors wanting to implement Asset Management, is finding the right people and assigning committed resources to its delivery. Asset Management is increasingly important – yet there are few experienced AM practitioners, and even fewer useful resources on how to develop an AM team.

The thirty years since Asset Management began to be established in Australia and New Zealand – and much less time in many places - is not long to establish a stream of trained and experienced people. AM is still not taught at undergraduate level, and only partially on a few post graduate courses up until now. It isn't included in the standard curricula of business, finance, engineering, urban planning or other relevant disciplines.

Another looming challenge is that now many of the thought leaders and most knowledgeable and experienced AM practitioners have been at this for more than two decades, and are transitioning into other stages of their lives.

Add into these the now legislated requirements in North America for Asset Management that require at least knowledge of it in those regulated organizations, and the demand wildly outstrips supply for anyone with any AM experience.

For example: one of the major themes that emerged from the AMONTario 2018 Conference was the resource challenge facing the Asset Management community there. Ontario Province now requires an AM Strategy and Plan in every municipality through ON Reg 588/17. New positions are being created in many cities and regions to coordinate or manage the asset portfolio to meet this requirement, but there is a lack of skilled Asset Management professionals to fill these job openings. If only 10% of the municipalities in Canada hired one asset manager each, that would require 500 more of them (statistic given at the Canadian Network of Asset Managers conference in May 2019).

In response to the Federal Transportation Administration's rules for a Transit Asset Management Plan (TAMP) from October 2018, this same theme has emerged at the FTA Asset Management Roundtable, APTA Annual / Rail and Bus conferences, the Transit Research Board's Annual Meeting, and many conversations between individuals looking for solutions.

The convergence of increasing needs across industries for Asset Management practices and a lack of skilled and experienced workforce generates an urgent need to develop people and teams.

This guide is based on our personal experiences; it reflects the views of us as authors rather than representing our employers, any institution or the wider AM community. Neither of us could write this document alone. We needed the dual perspectives to provide depth and dimension to this topic: the inside experience of an agency team manager with specific goals and challenges, combined with the breadth of experience of multiple organizations from a consultant and trainer viewpoint.

We used 'beta testers' from the wider community - our thanks to everyone who reviewed and provided feedback to this version - but they cannot be held responsible for any infelicities or mistakes here.

We more than welcome your feedback to widen our perspectives and weed out anything less than helpful in future versions.

*Strategic Asset Management calls for risk-based decision making, cross-functional working, and long-term thinking. It needs clarity on competence requirements and accountability and honesty about performance – **Chris Lloyd***

About Us

It is rare that a person can say that they contribute to creating and protecting the assets, systems and cultures that people will use for the next century or beyond. Working in transportation and other infrastructure, that is exactly what we do.



Lou Cripps:

I am the Senior Manager responsible for the Asset Management Division (AMD) at Regional Transportation District (RTD) in Denver, Colorado.

I am first of all committed to the RTD Asset Management Division, and the amazing individuals on the team. I am also dedicated to active networking to help develop Asset Management capabilities to move the transit sector, through APTA, TRB, and the Institute of Asset Management. Through this networking, other transit sector Asset Management practitioners have asked for my experiences in setting up an AM team, including job descriptions, business cases for recruitment, and finding great people. But I only really know my own experiences, and so am collaborating with Ruth to make use of her experiences with Asset Management teams in other organizations, sectors and countries.



Ruth Wallsgrove:

I have run an Asset Management (AM) team myself – as General Manager of Strategic Asset Management at New South Wales RailCorp (now Sydney Trains) – and been an AM consultant for a total of over fifteen years on and off now. I have worked in many countries and various sectors. I have seen a lot... Companies have approached developing and organizing Asset Management capabilities in a wild diversity of forms and with different aims.

I am currently responsible for developing AMCL's clients in Western USA, where there are transit, power, cities and public utilities on a spectrum of starting out from scratch, to one of the very first organizations to be certified to ISO 55000 (PG&E Gas Operations); agencies who adopted ideas from Australia years ago, to those who took their first steps in response to FTA TAM rules in 2017 or even later.

Our target audience

- Senior executives considering starting an AM function
- Asset Management practitioners
- Asset Management leaders
- Asset Management teams
- Senior managers before they embark on implementing Asset Management
- Human Resources charged with recruiting AM practitioners
- Regulating agencies
- Trade associations and educators

How to use

We intend this guide to be helpful if you are:

- Developing a business case for setting up an AM team
- Establishing a team
- Restructuring or expanding your team
- Building justifications to hire specific staff
- Considering where to locate an AM team in the organizational structure
- Wondering how to find and attract the staff you need
- Thinking about what to look for in good people

We have attempted to make it easy for you to find material on specific questions, rather than having to read the whole thing cover to cover first. It does not have an index, but we hope the table of contents will help you find what you are interested in.

What we have not included

This is not intended as a general guide on team management, leadership development, consultant procurement, or HR processes, for which there are existing resources out there. We talk about specific AM training, as well as specific issues in training AM practitioners or recruiting for an AM team. But we do not say much about why AM is a good thing in the first place, other than some tips on what to use in developing the business case for an AM team.

If you are looking primarily for how to get ISO 55000 Certification, RTD AMD is happy to share with you what we are doing – just ask. PG&E and MARTA in Atlanta may be even more useful, since they already have certification for parts of their organizations.

Note on AM upfront

Asset Management carries the flag for good asset stewardship, the responsibility that comes with managing critical infrastructure assets. We owe it to current and future generations. 'Planning brings the future into the present so we can do something about it now.' This includes understanding the intergenerational liabilities that are delivered with all longer life assets. And that once something is gone, it can't always be replaced. We cannot take a better future for granted; we need to work hard each day to bring a better future into reality.

We have to stop making asset decisions in silos, and start to join up the dots. For example, a decision to electrify a bus fleet has to be made with the full understanding of the interdependencies between fleets and facilities, for instance. The type of propulsion system in buses isn't a decision that can come from strategic planning or engineering alone.

For us, a basic question for AM practitioners is: And then what? We build a shiny new rail line. What is it going to take to operate and maintain it successfully and sustainably for the next fifty years or more?

We buy a new fleet: how will it interact both with the other assets and systems we already have, and with our existing skills and processes?

SECTION 1

The Asset Management Team

Why you need an AM team

Experience around the world over nearly 30 years strongly suggests the need for a specific, dedicated AM team to be accountable for the implementation and improvement of asset decision, asset risk and long-term optimized asset planning processes.

You can't just think things better. To improve, there must be action, and people with responsibility for those actions.

Specifically, ISO 55000 defines AM as the 'coordinated' activities of an organization to realize value from its assets. Co-ordination takes real effort, not just a general wish to co-ordinate.

This is no different than other functional teams within your organization where expertise and specialization deliver value. If it is your plan to deliver the AM capabilities, you need to be intentional in adding this competency to your organization.

The likelihood of hitting a target you haven't specified or aren't aiming at is low.

However, this will be a decision that needs to be compared to other functions of your organization. Do all organizations need dedicated engineering, legal, marketing, safety, security, or planning staff? The demand and value placed on each of these will dictate if these are specific positions, individuals or complete teams.

We were fortunate at RTD that we got support from the General Manager to establish a team, and it is a real credit to our leadership. It was a message to our regulators, to FTA in particular, that we really meant it. But we could not have done what we did to clean up our data and investigate condition properly without significant labor – and asset strategies are even more work. For other actions perhaps we could have done something without a dedicated team; but without co-ordination you can do some smart things and not get the real benefits.

We detail what a dedicated team probably has to take on below.

The Seven Revelations of Asset Management

- Asset management is a strategic approach, not a formula
- The asset management system is the end of the beginning, not the beginning of the end
- A collective shift in beliefs and attitudes is needed
- Asset management imposes a responsibility on individuals and groups to learn from each other
- Asset management is driven by collective learning underpinned by collectively shared knowledge
- Asset management requires personal commitment as well as professional development
- Asset management demands openness about past performance

*Charles Johnson and Chris Lloyd,
The Seven Revelations*

What isn't possible without a team

Without a focal point, organizations struggle to do more than isolated improvements, and generally lack a framework or structure to bring together the different activities around assets.

What most will fail to achieve, without at least a small dedicated team, includes:

- Asset strategy development
- Integrated long term asset planning: someone has to do the co-ordination, develop the processes, and build the relationships across functions to bring them together
- Anything beyond compliance to a check the box standard, and value that exceeds the burden of compliance efforts
- ISO 55000 or other standard Certification – someone has to manage this program of action
- Asset risk management beyond safety, general corporate risks, or a high level risk register
- Ownership of the Asset Management system and AM objectives

It also looks fairly impossible to implement good Asset Management with no-one who knows much about it.

Rule of thumb: you need at least two people who have been on an Asset Management course to begin

We might go further and suggest that if there is no-one who is prepared to identify as an Asset Management professional, dedicated to getting themselves and their colleagues developed in Asset Management skills, a company doesn't really know what to do or how to go about it.

It is easy in this area to be unconsciously incompetent – not even to know what you don't know.

We probably wouldn't even consider doing this in other areas: trying to take on a whole new approach to our business using a radically new discipline in an amateur and haphazard way without dedicated resources. It may reflect that many people don't really know what is involved, and why it is different to what we have done before. And hard to do without committed effort, because it does require real shifts in processes, emphasis and attitudes.

Sadly, companies who once had a dedicated AM function and then decide it is not needed anymore seem to go

backwards, as no-one is responsible for moving them forward. Anytime everyone is meant to be responsible for something, it also means probably no one is.

It matters who leads

If you do not have CEO and senior leadership real commitment to Asset Management, even the best AM team cannot succeed.

Even with this commitment, getting the right person to lead on Asset Management appears to us to be the single most critical action they need to take.

Unfortunately, you can get it wrong, and people can get damaged in the process. It almost feels like a one-shot deal: if someone takes it in the wrong direction, it can taint the term Asset Management and put people off in future.

If everyone doesn't really know what it means, but they are sold a line by, for example, a consultant who doesn't know either, they won't look beyond that misunderstanding if it doesn't seem to work. Real examples include organizations who decided Asset Management is an implementation of work management IT, a.k.a. an 'Enterprise Asset Management System'; or that it equates to reliability-centered maintenance (RCM). Both are very useful tools, but they aren't a transformation of the business in themselves, and can be expensive, painful and applied wrongly.

Asset Management is about people, relationships, assets and strategies. You need a leader that has some knowledge of each. Leadership is a skillset beyond technical knowledge or management proficiencies. So it is worth careful thought about who can deliver this to the organization.

There is more on what to look for below.

What are the key activities required of an AM team?

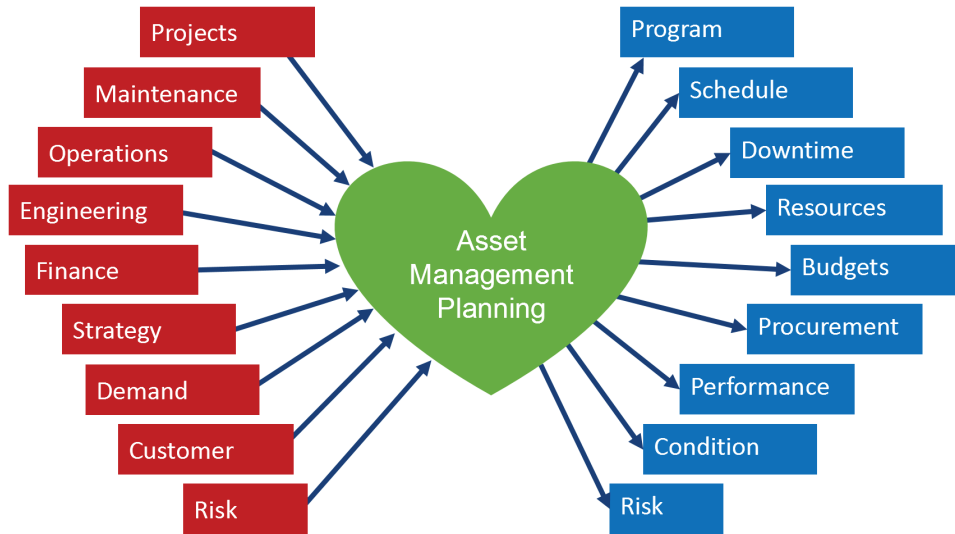
In general, the principle has to be 'what will not get done if there are no dedicated and skilled resources to do it?'

AM core responsibilities

This is our shared view on what an AM team should be responsible for.

Asset Management Plan (AMP)

Planning is the heart of Asset Management... As FTA Emphasizes



The original definition of AM in practice was the co-ordination of a short/ medium/ longer-term integrated Asset Management Plan, and this remains the core activity of an AM team. They do not produce the AMP on their own, because input both on requirements and constraints has to come from other functions. But someone has to ensure it comes together.

Asset Management Implementation

Main responsibility for leading and program managing AM implementation and development overall.

AM Policy and SAMP

Developing key AM drivers such as the AM Policy, and the Strategic Asset Management Plan, in other words the high-level summary Asset Management Strategy

Asset Management System

Implementation or coordination of the overall AM management system, as described in ISO 55000, either as part of a larger management system, or in some cases as the first management system.

- Consider how the organization schedules, reviews and improves asset strategies, plans, process and procedures; sets system scope and develops maturity plans; coordinates across management systems (it is essential that all management systems at least don't conflict); and sets AM system objectives and measures

This is likely also to involve acting as secretariat to

AM steering committees, and generally managing the governance process.

AM Compliance and Certification

If required, main responsibility for:

- Compliance to regulations such as FTA TAM or ON Reg 588/17
- Getting the organization certified to ISO 55000

AM Training and Communication

Explaining what AM is and why it is important, continually; building agency AM understanding and specific competencies through formal and informal training programs.

Asset Management Objectives

Development and measurement of SMART asset objectives and other targets for AM.

Asset Class Strategies

Facilitation, development and management of asset class or family strategies: these need to make full use of field and engineering experience, but again someone has to define, co-ordinate and often actually write them.

Managing Assets



Daily service



Age



Up-front cost



Maintenance



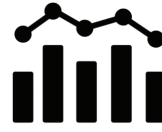
Local Expertise



Reactive

vs.

Asset Management



Long-term performance



Condition and risk



Whole-life cost



Lifecycle management



Integration



Proactive

Adapted from original slide by Simon Smith

Other Asset Strategies

Asset site, system and network strategies, which tend to be harder to coordinate. Making sure people look at system as well as lifecycle interdependencies, and not just on the class of assets or phase of the lifecycle they are responsible for – a major issue in what we call ‘stupid’ decisions, like buying a train fleet that doesn’t fit on the tracks, or building a plant that can’t be maintained. ‘Joining it up’ is a key responsibility in good practice Asset Management.

Asset Information Strategy

Very commonly, there is no-one else in a good position to lead on a better strategy for asset information, which in the absence of a strategic approach is expensively scattergun in many organizations. AM decision-making must be the main driver of investment in asset data and asset data systems, as using information to make better decisions is the only thing that gives data any value.

Asset Analysis and Modelling

Data analysis and modelling of assets (for example, whole life cost models), and generally leading on asset decision techniques and tools.

Maintenance optimization – a well-established set of techniques centered on RCM – can usefully be done by a trained small team within Maintenance, but replacement and refurbishment program optimization is generally a core AM team capability. Note that both Operations and

Engineering come with their own views and interests on investment, and as AM pioneer Jim Kennedy put it, are ‘poachers’ rather than ‘gamekeepers’; you need a more objective, unbiased focus for prioritization.

AM Practitioners also need to play a key role in helping define any corporate risk framework – for an asset-intensive organization, asset risks make up a high proportion and a very wide range of business risks.

In US transit agencies, generally the major AM team responsibility in the past few years has been the production of the TAM Plan to meet FTA rules under MAP-21 as well as National Transit Database (NTD) data.

Someone needs actively to bridge between managing assets and Asset Management. Managing assets is vital, but it is not the same as Asset Management (see ISO 55000 committee note on the difference in the Appendices).

What we need is a relationship of collaboration with our assets, in which we recognize it's more about them than about us

Basic AM Roadmap Activities for a new AM Team

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	And on...
AM Assessment	■								
AM Policy		■							
SAMP			■	■					
Asset Class Strategies					■	■	■	■	■
AMP Process				■	■	■	■	■	■
Asset Info Strategy					■	■	■		
Asset Risk Framework						■	■	■	■
Communications	■	■	■	■	■	■	■	■	■
AM Training	■		■		■		■		■

Phases of Asset Management

Penny Burns, one of the founders of modern Asset Management, identifies three phases (or ‘revolutions’) that it is worth considering when you look at building up AM capabilities.

First, there is ‘Asset Inventory’: ensuring we actually know what assets we manage, where they are, what condition they are in, cost, expected life and their type and model and age. With the encouragement of MAP-21, many DOTs and transit agencies have worked hard in the past few years to collect their asset information, and this may also include implementing work management (often called EAM) and GIS systems to hold this data. RTD AMD went through this stage from 2012 to about 2017. We realized that our confidence in our decisions cannot exceed the confidence we have in our data. We put a lot of effort into cleaning up the inventory data, including individual attributes of each asset. It was even determined that scoring the quality of the data on the individual records would be useful in an effort to understand the overall quality and accuracy of the data before and after the clean-up efforts.

(But it’s important to bear in mind that we also need to have people with the skills necessary to use data. For example, it was suspected that a particular brand of HVAC unit on our rail cars had a higher life-cycle cost despite having a much lower upfront purchase price. It took the data team to collect the cost and performance across several years to provide and confirm data that supported the decision to purchase a more expensive upfront cost unit.)

The next stage is what she calls ‘Strategic Asset Management’, in other words ‘Optimization’: using this data, along with our understanding of the assets and

asset systems, to begin to optimize at every level. This includes both maintenance optimization, using RCM or more generally risk-based maintenance techniques, and capital renewal (replacements and refurbishments) optimization, which is usually the focus of any funding or regulation-driven Asset Management. It’s not clear any organization has finished with this stage – certainly nobody we know of. But it’s worth pointing out that this is where good Asset Management starts to make a real difference to the assets themselves, and impact on costs, risks and performance. The data alone doesn’t do this!

Penny believes skilled AM practitioners are key to the next revolution, too: better ‘Infrastructure Decision Making’, by which she means society making better decisions, especially in a time of change and new technologies such as we face now. Technologists and traditional ‘Planning’ are not experienced in the practicalities of managing complex asset systems, and without this real expertise, we are unlikely to make best use of opportunities.

A good AM practitioner can be the most effective bridge between new ideas and implementation on the ground, and Penny hopes we all will pick up the challenge.

Other potential responsibilities

- Close involvement in the requirements, design and implementation of an EAMS - AusGrid in Australia among others strongly suggest that’s the only way to get an effective EAMS. However, we recommend this does not extend to actually administration of the system, and you should think very carefully before involving a small, skilled, planning-oriented AM function in data entry of any kind. There are easier and cheaper ways to do that!

- KPIs / Levels of Service. If Asset Management is about aligning asset decisions and plans to the organizational objectives, the first issue for many North American organizations is that the latter aren't well defined. Sometimes, that inevitably means AM practitioners have to be involved in helping to define them. (And that is explicit for levels of service in ON Reg 588/17.)
- Risk Management Framework overall. Good Asset Management requires this, so we probably have to be heavily involved here too. This can include helping define organizational risk appetite. (Ruth is lucky to work also with Todd Shepherd of Tacoma Power, who is leading the way here.)
- Integration between AM and Safety management systems
- Asset Performance monitoring, including dashboard information and data analysis
- RCM support
- Asset audit preparation and support
- Involvement in longer term financial planning processes (that goes with the AMP process) – which may well include heavy involvement in anything like a General Rate Case or Application.
- Involvement in longer term resource planning (ditto)
- Involvement with business cases, both the policy, procedures, and analysis, and perhaps even supporting Delivery functions in developing good business cases
- Responsible for some Safety management system interfaces
- Asset level target setting and reporting

Ruth: the Strategic Asset Management team in NSW RailCorp also included the Technical Audit function, and the development of an internal Lean Six Sigma team, as well as AM training.

It also got involved in the strategy to recruit and train up more signal engineers, a perennial bottleneck skill in rail infrastructure. The AM Planning team developed a ten year detailed outlook on both renewals and new construction programs to optimize the use of the signal engineers we had, but this also proved that we could not deliver what we had committed to the State government unless we had more signal engineers. We then worked closed with HR to support a strategy for this.

RTD AMD also has a further major role that is not always present in an AM team. AMD has responsibility for facilitating and co-ordinating the definition and target setting of corporate Key Performance Indicators (KPIs), using AMD data analysis skills and experience to facilitate a larger group of internal experts, and reporting to the AM Accountability Team (RTD's AM steering group).

Some AM teams – such as Tacoma Power - take responsibility for clarifying corporate risk appetite and risk framework.

Todd Shepherd, who worked with Tacoma Power's Senior Leadership Team to develop an organizational Risk Profile that formed the foundation of their Asset Risk Framework, notes, "The Risk Profile captures corporate risk tolerance and appetite in a measurable way. This allows us to understand when asset risk is not something we can accept and needs to be addressed differently. This is one example of how Asset Management helps align decision-making about our equipment to corporate objectives – it's our job to make sure the work we're doing is based on robust data, but also reflects the vision of our leaders."

It seems inevitable that Asset Management has to take an active role in developing an overall organizational risk management framework, even if the lead is taken by a specific corporate risk function. This is not just because this is a key requirement in ISO 55000 back to back with ISO 31000; good AM depends on a solid and consistent risk framework across the organization and across all risks. Physical assets can impact on just about every corporate objective, which means they can also contribute to just about every type of risk you have.

Enabling functions

A focused, skilled AM team has still more to contribute to an organization: such as supporting intelligent decisions on capital specifications, project 'sponsorship' as in Transport for London, specification for procurement, supplier and contractor management, spares optimization, and making full use of root cause analysis.

Summary list of main responsibilities

1. Co-ordinating the integrated Asset Management Plan
2. Leading the implementation of Asset Management, including AM training
3. The development and implementation of co-ordinated asset strategies both at class and system level
4. Key role in defining the asset information strategy
5. Key role in defining the asset risk framework
6. Focus for improved asset decision techniques and models

What kind of people does an AM team require?

Considering what is required – and the world now has nearly 30 years' experience of what it takes to make Asset Management work, starting in Australasia and from the late 1990s in Europe – it is not surprising that dedicated AM roles do not suit everyone, and many organizations have made some mistakes in their AM appointments.

It is also true that the different requirements of a well-rounded AM team will always make it unlikely, even undesirable perhaps, that one individual would hold all the necessary skills and experience. Instead, we need each team member to have confidence in their own strengths and complement each other towards a common purpose – very much like the ideal Asset Management organization writ large.

Asset Management and balance: complementary experiences and aptitudes

Any AM team requires a balance of people.

1. Asset Management is a bridge between business strategy and technical delivery, and therefore must consider the right balance of attributes and skills to deliver this. Bluntly, an Asset Management team that is purely technical, or alternatively has no experience with assets, will struggle. Some experience in the team on front line delivery and, even better, existing relationships with the front line, especially maintenance, is invaluable, but AM also needs good analysis skills and business understanding.
2. More challenging for some technical people is the need for good communication skills. Since AM implementation is hugely about communicating what AM is about and facilitating the improvements, AM practitioners must at least value communicating. This will, sooner or later, require communicating some complex ideas and processes to people from the executive suite to the front line of service delivery – and including external stakeholders
3. AM functions have to see themselves as promoting, influencing and coordinating rather than directly delivering. (Wally Wells of Asset Management British Columbia calls this the folded arms approach.) This means developing good relationships with a range of other teams. AM practitioners have to be able to acknowledge and respect what other people know, and have some detachment, because their role is to bring together different teams and types of experience & knowledge into asset strategies

and integrated planning, not to try to impose their own opinions on asset decisions. They must have a big picture view of the business such that they understand concerns within silos but can explain the needs of the entire organization to put the concerns into context.

4. Another specific requirement is for people who can 'embrace uncertainty', since AM is at its heart about planning for the future – and the future is always uncertain. For example, ProGas in the Netherlands in the early 2000s focused on promoting smart technical people into asset planning: the only ones who succeeded were those who could cope with making decisions on clearly imperfect knowledge and data. Many could not.

When Penny Burns took the RailCorp Strategic Asset Management team managers through Scenario Planning training, the most important outcomes were making everyone feel a little less certain about the future for the railway – and set us to thinking hard about what data would indicate a real trend.

5. The ability to think probabilistically is not intuitive, but it is of great value and can be learned. Those that have developed their understanding of probabilities can use this thinking to help address the uncertainty that is essential to describing systems, predicting outcomes, and influencing outcomes.
6. A structured approach to problem solving, even to questions where there isn't an obvious right answer, or the exact answer can't be known, is important. AM practitioners should be curious and ask questions, working to discover root causes.

The strongest AM practitioners seem to know when there isn't a single correct answer, and what set of constraints should be used to move forward with the next best alternative.

An Asset Manager has to be comfortable saying, "I don't know."

7. It's also vital to be able to see what is important, the AM principle of 'criticality, and the balance of 'cost, risk and performance' in what we do ourselves.
8. AM implementation is about change, so generally will not suit anyone who primarily seeks stability or following the old rules. We need people who have some social skills and ability to build good working relationships, at the same time that they will push for change, in other words stand up for new ways of working.

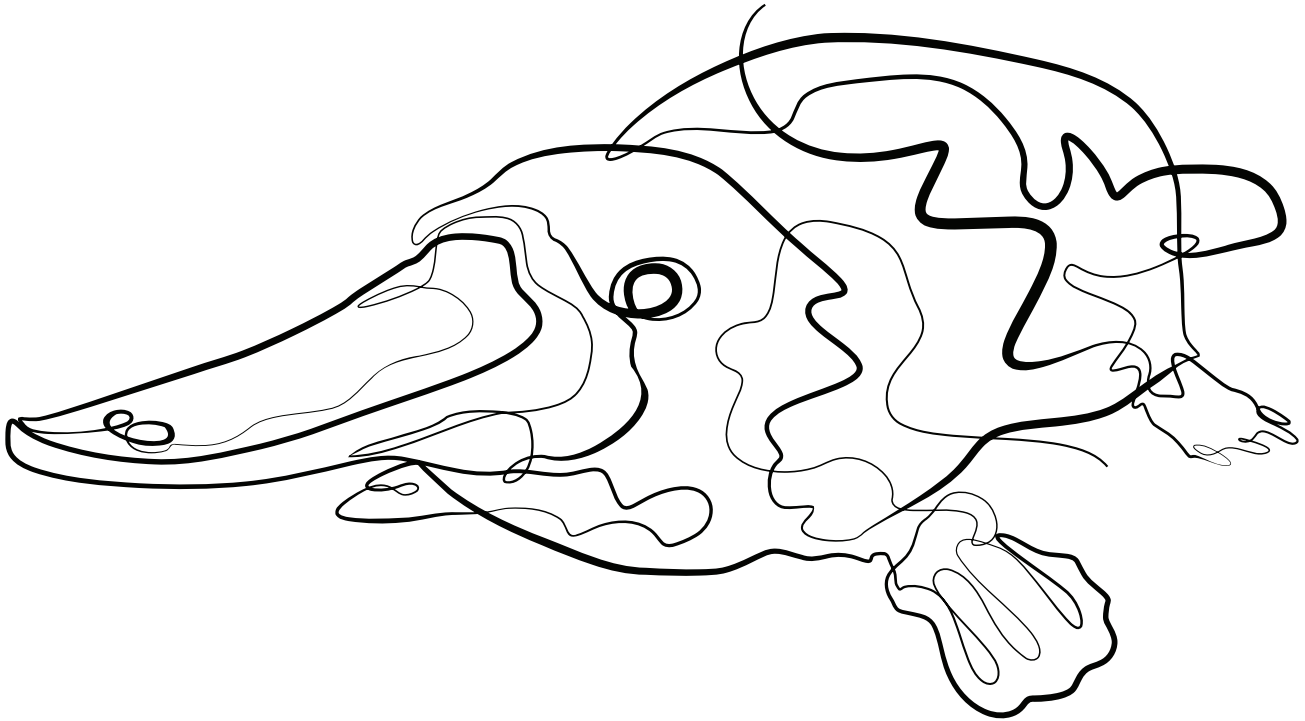
9. Continual improvement requires a desire to learn new concepts and ideas, even when the evidence overturns what you expect. Continual improvement requires a place of pause and reflection before the next Plan-Do-Check-Act cycle is commenced.
10. Leadership skills to get others to buy into our new ways of thinking and working.

And the ability to balance the natural tensions that exist between all of these skills....

This is hopefully not to completely depend on unicorns - or platypuses - that we may never find.

We are looking for an odd and tricky combination of attributes. Instead of searching for a very rare and sought after amphibious, duck-billed, otter-footed, egg-laying, beaver-tailed, venomous mammal that locates prey through electroreception - it's easier to provide all the things we need through a complementary team.

It is also important to understand what skills we don't need because they exist in other areas and within the asset class groups. We don't need to be experts in all areas if we can coordinate with others.



Ideal Asset Management Practitioner = Platypus

Experience versus training

One issue to consider seriously is what skills can be trained – such as general understanding of AM itself, via the Institute of Asset Management (IAM) levels of training for example, or good Excel skills – as opposed to what attributes and experience some people in the team need to come with.

In general, at RTD we have gone for people who have demonstrated technical knowledge in other domains and practical skills that have been effective elsewhere.

AM teams do not always get to select their own staff, but instead inherit them; this can mean other teams offloading people who haven't been effective elsewhere. This probably means they won't be particularly effective at AM, which is generally challenging.

However, don't necessarily be put off by 'square pegs in round holes': those who can do much more than they are currently supported to do, for instance. (This is Moneyball territory...)

Good AM practitioners are bound to require a combination of training, education and experience – and also personal attributes.

At RTD, the overall challenge of lack of people with specific previous AM experiences has been tackled via:

- IAM Certificate and Diploma training
- Structured as well as unstructured discussions on key AM topics.
 - An example, from when the team was preparing for the IAM Certificate and Diploma tests. A manager and one of the business analysts created a learning plan and schedule for the team. Each week a different member of the team would take a chapter from the AM Landscape, the IAM's 'Anatomy', and other documents. Then the person with that chapter would send out highlights and questions to be reviewed. The meetings were book club style where the materials were reviewed and real life examples of principles discussed. This helped us all solidify the materials and supported our cross team learning culture.
- Targeted use of external consultants to support the development of our processes and strategies – not writing them for us, but bringing examples & templates and talking us through how we might approach them
- Selecting people with many years of valuable asset experience, for example with existing working relationships and in the field; they then have shorter remaining working life, of course, which needs to be balanced with younger people who can be developed for the longer term.

Common Attributes for everyone in the team

Chris Lloyd and Charles Johnson, in their Seven Revelations above, identify several principles that require personal values and attributes – responsibility on individuals and groups to learn from each other, driven by collective learning underpinned by collectively shared knowledge, personal commitment as well as professional development, and openness about past performance.

Asset Management requires honesty, tackling difficult and new problems, and determination to pursue improvement.

Accordingly, RTD AMD looks for these attributes in everyone it hires:

- Highest ethics and integrity
- Cognitive ability
- Objectivity and self-awareness
- Basic numeracy
- Effectiveness
- Curiosity / lifelong learner
- Problem solving
- Humility
- Initiative / motivation and grit

A good sense of humor also helps.

AM practitioners have to be 'honest joes' in decision making – which means personal integrity and credibility

Role Specific Experiences and Skills

Specific experience and skills that have proved useful in Asset Management teams include:

- General business acumen
- Data analysis, high numeracy and the ability to build models
- Finance experience
- Process design and implementation
- Change management (using for example Prosci)
- Experience with facilitation
- Good sense about what asset information is needed
- The ability to 'bridge' between areas, problems, or decisions
- Knowledge of specific asset disciplines
- Asset maintenance and operations experience
- Good understanding of risk concepts
- Writing and documentation skills

Some roles require a high degree of communication skills.

Other role specific experience and skills might include, organization and planning skills, and managerial experience & abilities.

See the Appendices for some example of specific job descriptions.

Summary of team attributes

In other words, an AM team ideally needs:

- Balance of technical and business understanding
- Some front line experience
- Some good system and structured thinkers
- Longer term perspective: 'And then what?'
- Emotional intelligence and communications skills
- Strong proportion of people who can 'embrace uncertainty', probabilistic and scenario thinking
- Some openness to change – but not novelty for its own sake
- Honesty and integrity
- Enough leadership skills to get others to buy into our new ways of working

What is required of the AM lead?

To be a leader they must first have the core attributes of a good person: integrity, authenticity, responsibility and purpose

AM is as much a business and communication function as a technical one in practice. Whoever you select to run the AM team, they must have:

1. Some good team management skills – or be actively developed in these
2. Communication skills to communicate and co-ordinate both upwards to senior leadership and external stakeholders (for example Boards for public agencies and other politicians), with delivery functions, particularly closely with Maintenance, and with key support functions such as Finance, Procurement, and IT. They have to take the main responsibility for buying the organization into good practice AM processes.
3. The ability to inspire the actions of others towards a common aim. Not only is AM about alignment to

shared targets, it's also hard to implement, and so needs people who are inspired.

4. Understanding the importance of good business processes themselves!

We would also include be willing to be wrong, and continue to move forward.

It should go without saying that they need to understand Asset Management, and at a minimum this means they have been through some training. Recruiting someone from another organization who has already done AM is of course a great idea – if you can find them. Demand wildly outstrips supply of experienced AM practitioners in North America, and indeed elsewhere.

Who is selected sets the tone and will need to lead the effort up and down the organization.

Lou: they must be a leader and not just a manager. This will include knowing the direction to take the team and the abilities to get others to want to help get there. They protect and care for the individuals, the team and believe in the cause themselves.

The lead is not required to be the technical expert: they have to be okay with surrounding themselves with experts who know more than they do.

See also 'Asset Management and Intelligent Co-operation' for more of our ideas on AM leadership (available from Ruth).

Warning: you are building Asset Management practitioners and leads for others!

If you build a good team, there is one thing you need to prepare for: that they will get head-hunted away by other agencies looking for someone with real Asset Management experience. This just happened to RTD AMD.

Both of us find this personally painful – we tend to love our teams and the good people in them – but of course it is part of developing good AM more widely. It's probably wise to assume that, since some of them will move, it's worth encouraging them in good management and leadership skills all along. And you have to want the best for the individuals on your team, otherwise you won't be a good lead yourself.

How many FTEs does an effective AM team need?

There isn't a known ratio of individual assets to people, but instead it must depend on the complexity and strategies of the organization. More than 3, probably not more than 30 unless other functions are included under the same umbrella.

It is hard to do with less than three people, i.e. an AM lead and two others. It is (we believe) a general rule in life that it is hard to do any significant change initiative starting with less than three.

Ruth: A favourite story from elsewhere is a phone call I got from a line engineer in a PUD, saying he'd been appointed part-time AM lead with the brief to transform the business... helped along by the fact he didn't know what AM was. (I sorted out a plan with him over several cups of coffee, to go on a course a.s.a.p. and then develop a business case for something a bit more than one half-time resource.)

In contrast, by the time I got there, NSW RailCorp had many people in its Strategic Asset Management team: two teams each the size of RTD's entire AMD, responsible for AM Planning and for Asset Information (which was not EAMS admin, IT support, or data entry but supporting people in using asset data for decisions as well as supporting field collection of data), plus Technical Audit, Business Process Improvement, and AM training, and we then added Lean Six Sigma, system modelling, and asset strategies. This is unusual – and note that this team no longer exists for political reasons unconnected with AM.

RTD has 17 for an asset base on the balance sheet of around \$8.9Bn - everybody is busy full time!

However, you don't have to, and probably shouldn't start with the full complement you believe it will take. Like almost everything in AM, it's more important to make that start than to wait for perfection.

See also sizing section under the Business Case later.

Where should the AM team sit in the organization?

It's a repeated cry in AM networks to watch where you put Asset Management. As long ago as we can remember, people have stood up and explained why placing it under Engineering or Operations are really bad ideas – from their own experiences. London Underground, for example, felt it had to move AM out from Engineering if it was ever going to succeed; AM found a much more effective home with Finance.

Ark Wingrove of Kompas ('The Wandering Asset Manager') points out that where you place AM determines how it is seen, another reason not to put it under Engineering. To suggest AM is a branch of Engineering is seriously to limit what it can impact on. It is, as both Penny Burns and Chris Lloyd have long championed, more a strategic business than a purely technical discipline. Of course many good AM practitioners have engineering backgrounds (although plenty do not), but that shouldn't be mistaken for thinking it is the same thing.

It is also vital to think where it sits vertically. In a Diploma class some years ago we came up with a graphic to relate how high up an AM team reports must relate to what you think it is doing. If it is about strategic decisions, it needs to be at the strategic table; if it is more about maintenance optimization, then it will probably report lower down. How far up or down it is also spells out how seriously we should take it; if it's too many levels down, how much are we signalling we want it to transform our organization?

AM is a better way to manage our asset base overall. For an asset-intensive sector like Public Transit, that means how we do business overall.

If we can't deliver our services without serious investment in physical assets, and the majority of our organizational value is in assets - and if we need to take a more strategic view of our assets to survive going forward - shouldn't Asset Management be part of the C suite? Not many organizations have come to that conclusion (so far), because not many have yet understood how strategic it is.

Some suggested basic rules of thumb:

1. Not too far from the CEO. If the head of the AM team is more than a couple of levels down, they will be too far down to do their job effectively, not least because AM must have an active relationship with the CEO and senior leadership/ the executives.
2. Ideally not under a Delivery function, because that can pull the AM team into short-term or partial planning: the opposite of what you want. Organizations have generally not succeeded in changing their strategies and plans when AM reports to Operations, Engineering, or Capital Delivery. Any of those reporting lines is in many ways the wrong way around. Of course Asset Management needs a very close working relationship with Delivery; just be careful who calls the shots. (Poachers and gamekeepers, again...)
3. AM in Finance, in Corporate Services, or in hybrid Risk/ Safety / AM departments can all work. This may be because, on the whole, functions like Finance don't actually have a view on assets and let AM practitioners get on with it (as opposed to the Delivery functions, see above). For any of these, it probably entirely depends on the attitude of the person heading the function - the right CFO, for instance, can be a real champion of good Asset Management.

I see AM practitioners being a bridge between technical experts and financial experts. Someone needs to turn an unconstrained best acquisition, maintenance, and renewal plan into a viable business case that financial decision makers will feel confident to invest in.

Engineers are not usually business savvy. Their perfect world involves gold plating everything they design and maintain.

Financial experts don't usually appreciate a well maintained asset system. Their perfect world involves paying the bare minimum required to have assets barely function as needed.

AM practitioners need to understand both the technical requirements of asset systems and the business realities of constrained funding. AM

practitioners effectively mediate these conflicting priorities by balancing cost, risk and performance. If they are effective, both engineers and finance people are happy and the system performs efficiently.

Without AM practitioners, finance people tend not to trust engineers because engineers seem to always overstate their case. Engineers feel as though they must overstate their case to get enough money to maintain asset systems. Asset Management can be the grease that allows these two gears to work well together.

Chuck Austin, RTD AMD Manager, Business Analysis

Notes on some other options

Asset Management is balancing risk, cost and performance - so probably not a good fit under Legal or Compliance.

And anything like 'Standards' has to be looked at with caution. Actively working with asset standards and their development in a SMARTer, more criticality-based and optimizing direction is a major long term goal for good Asset Management, but working for someone who thinks the answer is simply more standards is not such a good idea.

In some places AM has been put with what is often called 'Planning'; this sounds ok, but weirdly top-level Strategic Planning can come with its own prejudices, often for growth rather than sustainability, and for 'big' decisions that don't take into account what's happening with the assets on the ground. If Planning dominates, beware of ignoring 'bow waves' of renewal and maintenance backlogs.

Strategic Planning - along with most top managers and Capital Delivery - is often reluctant to measure the performance or accuracy of past predictions related to asset delivery and performance. Let's face it, almost everyone is reluctant to go back and really review past decisions for major investment, in case we don't like the answer. AM practitioners, however, have to push for this going forward, or we simply don't learn the lessons.

However, a real Business Strategy function - if anyone has them in Infrastructure - could be a good fit, if it's prepared to get its hands dirty with decisions on the existing assets today.

AM is never a function of Information Technology (IT). Tail wagging dog territory: good Asset Management needs good appropriate data, on costs, failure history and performance, but it isn't a data function itself. Let alone about the 'storage containers' for data, as a

British Asset Information Manager once rather bluntly described IT. (Those storage containers, in other words the software and hardware required to run the business, need asset managing themselves, of course; but that's a different issue.)

Since AM is the balancing of performance, risk and cost, it can sensibly reside in a department that includes safety, risk, performance management and decision sciences. However, this sounds hopelessly ambitious for many small agencies or public utilities, who may have none of these things.

Note that 'risk' in an organization sometimes means only some risks, like safety, or compliance. We take it as given that physical assets can impact on almost any corporate objective in infrastructure businesses, and therefore can pose risks (and opportunities) to any area of the business. Wherever AM sits, Asset Management means expanding the organization's definitions of risk ("the effect of uncertainty on objectives" – ISO 31000).

You may find there is a reason to start by locating AM in a business unit you may feel it probably should not end up in. We all live in organizations with their own internal 'politics'. Sometimes a Delivery function, for example, feels it has to control asset decisions and therefore has to contain any AM function. We have to deal with what is there, while keeping our eyes on what we are trying to build longer term.

Some traps

It's impossible to overstate the importance of building working relationships in successful Asset Management. However, this also can lead to one of the biggest traps for AM practitioners, if they are experienced and smart maintainers or engineers who know a lot about the assets. To be helpful and reinforce bonds, some teams get caught in helping on short term technical issues –

something Operations and Projects may be only too happy to make use of.

Some years ago Scottish Water had a roadshow on AM to take to local offices and depots across its wide region. These sessions always had an Executive to introduce them, because it makes a huge difference if the CEO or one of their executive peers is there in person to say Asset Management matters. (People listen harder if an executive says it matters.) One of them always started with the line: "It's time to put the planning... into asset planning". Asset planners were being pulled back into day to day issues, because they were very useful, but that meant they had no time to do the longer term planning which was their actual responsibility.

A Pacific NW power company had the same problem, and regretted that once people expect you to work on immediate issues, it's very hard even to be seen to have a longer term role.

Another thing to watch: Asset Management is not IT, despite a fairly widespread misconception fostered perhaps by IT implementers. Be very careful how much you get pulled into IT processes generally.

And this can include making up for deficiencies in IT systems. Excel is an invaluable tool for AM practitioners, and you will definitely need some skills in it in your team, but we should not in the medium term be using it to make up for some basic IT capabilities in asset inventory, work management, and performance reporting.

Your IT function can be an ally to good AM, or not. One fairly common battleground in infrastructure is who controls operational IT systems, whether these are passenger information or SCADA systems. (There can be the same kind of tussle between Facilities and Maintenance & Operational facilities specifically.) Asset Management can help by teasing out the different kinds of responsibilities and skills required, but you probably do not want to get caught in the middle.

Background to RTD Asset Management Division (AMD)

In late 2011, RTD assigned two people the task of building an Asset Management division (AMD). The division would be responsible for improving the management of assets and building an agency-wide AM system. There was also the desire to better understand the condition and performance of existing assets and improve maintenance tracking and general data collection. RTD was coming to the end of decades of system expansion, and there was the realization that we now had a base system with some components that were nearly 50 years old and an inventory that recently doubled in size.

It was important to the senior leadership team (SLT) that in order to have the most accurate, non-biased information possible, AMD should be independent of the asset delivery functions and from responsibility for any specific asset classes. It is also vital to have one team looking at the longer term, beyond immediate delivery priorities. This team would be responsible for the introduction of management systems into the broader agency culture.

AMD was placed alongside the safety division, with both reporting to the Chief Safety Officer (CSO). The nexus between asset condition and safety and their management system frameworks made this a sensible structure.

It was later realized, that in order to avoid creating an AM silo, AMD would serve as an expert enabling function to the agency. Organizations starting out will simply not have all the specific knowledge and skills in AM that they need. Some of these need to be built up over time, but there has to be a center of excellence for these new skills. This team would create the ecosystem or environment including the training ground to build a team of AM experts.

Having set up a team, from the passage of MAP-21 in 2012 through 2016 when the final TAM rule came out, AMD added additional staff in two key areas: physical asset business analysts, and data sciences. These teams were recruited both internally and externally.

Internal hires were proven problem solvers from across the organization, either with experience in maintenance in each of the asset classes, or good data skills. This expertise and experience added credibility across the agency. External candidates were recruited where no internal candidate was available with the right blend of knowledge, skills, abilities, drive, fit and balance. External people in any case bring new perspectives that can be invaluable.

The strategy is for AMD to continue to attract and retain the best talent to deliver AM expertise at RTD. The AMD recruiting process emphasizes a culture of excellence. The division continues to build AM competencies through training and practical application.

Things that worked

These include:

- Building relationships
- Establishing and maintaining buy-in with SLT and CEO's
- Establishing strong trust and transparency with regulators early
- Larger AM community networking, support and information sharing
- Credibility of key staff
- The data clean-up efforts
- The use of whiteboards
- Our team recruitment approach – we have hired some great people (see later)

Things that didn't work so we stopped doing them

We have to agree to stop doing what doesn't work.

In the RTD AM team, we encourage people to build hypotheses and test them – and give them up if they don't work. We constantly ask the question, do we know – can we articulate - the evidence necessary to change minds, or shift people from certainty?

An example of this at RTD was the early work done around physical condition of our fleet vehicles. Initially it was believed that doing a physical condition inspection or assessment on every vehicle would provide valuable insights into overall fleet cost, risk, performance balancing. We developed data collection tools, comprehensive inspection processes with complete condition libraries and in-depth team training.

After more than five years of performing physical condition assessments on every vehicle, we retested our original assumptions. We were surprised to find that, in fact, we were not adding appreciable value. We had collected mountains of data on cost, physical condition and performance. Utilizing our new data – and correlating between the different factors - we realized we had invested thousands of hours of time into something that could be achieved with less effort using the existing age-based processes.

Learning your hypotheses were wrong can be hard on morale and egos. In conversations post mortem, we determined the exercise was not wasted. It helped us in several crucial ways: since we 'touched' every asset for some years, it allowed us to clean up our data records across multiple systems; it enabled us to build tools and reports for better tracking of the cost and performance of vehicles that helped others make improved decisions.

Another program that came out of the RTD AMD team was the use of Unmanned Aerial Vehicles (UAV) or Drones. This program was extremely successful by some measures: we even received national attention for the first legal UAV asset inspection program in the US transit industry. We stood up the program for less than \$20K.

But when we checked the results of the program against the hypothesis of more accurate data, it didn't solve the problem, and we suspended it. Although it was a popular way to support other agency functional teams, it didn't provide us with better information for Asset Management.

Things that we knew we wouldn't do

- Wait on communication of management systems
- Use expensive 'Business Intelligence' tools to solve problems that could be done with less complicated systems
- Focus on any specific software package as the 'solution'
- Focus only on compliance to regulations
- Aim for apparently low hanging fruit without connecting it back to larger projects
- Use job titles and descriptions similar to those used in IT or service delivery functions
- Manage re-implementation of EAM systems into SCADA, FM and other divisions. If they don't own it, they won't use it.
- Believe the stated quality of data
- Complete asset inventories for other divisions



AM Governance & Top Management

How Asset Management is governed – in other words, how direction is set, progress monitored, who approves what – is key to ISO 55000 compliance. And also trickier than it might seem to begin with.

Many organizations have an AM Steering Committee, of senior managers, who approve and guide what is done on the AM system. For example, who sees the Draft SAMP and agrees to take it to the Executive for approval.

But such bodies share some issues with steering committees of all kinds: even with a clear charter the question of how seriously they take their role, and indeed how much they understand of the issues they are steering.

At RTD, after an ISO 55000 health check, it was decided we had to make the steering committee more accountable, and comprised of managers with ‘skin in the game’, in other words whose assets and processes were in scope and significant to the AM system. It was renamed ‘AM Accountability Team’ to stress they were accountable not only for ensuring their teams do what is required as part of the AM system and (for us) ISO certification, but ultimately for making AM work.

All our Senior Leadership Team had been through a briefing on the concepts of Asset Management, but some organizations go further – at Manitoba Hydro, all the Corporate Asset Management Steering Committee went through IAM Certificate training, which really made a difference to their appreciation of what is involved in good practice AM.

Steering committees typically don't have the CEO or equivalent on them, but instead are a subset of the Executives. But we would not recommend that the AM

team leave the communication with the CEO to those executives, because you should aim for a close working relationship directly with the CEO if you can. This isn't to go above the steering committee, but rather that the relationship with the CEO really matters to the success of AM. And this relationship can only be built on true two-way communication, not just through formal presentations and briefing notes.

Under FTA TAM rules, there must be one ‘Accountable Executive’ for AM, for example, and at RTD that is the General Manager. (The Ontario municipalities legislation also requires someone to be accountable and sign off on the Strategic AM Policy, although that's not always the GM or CEO.)

At RTD we were lucky – and worked hard – to ensure AM was owned and understood by our GM, and he was and is the champion. It is very hard to do if the top person isn't interested.

And it is worth stressing that the scope of the AM system itself actually includes top management, their objectives and business strategy, and their relationships to external stakeholders.

This guide talks about the AM team as a team of dedicated AM practitioners, but that should not be taken to mean AM is only about what they do. You always have to have a double vision of AM: those AM practitioners with particular responsibilities for implementing AM, and everyone who must participate in the AM system to make it effective, starting (ideally) at the very top.

At RTD, the AM Division communicates directly with our directly elected Board as well, for example briefing Board members on what AM is and our progress. We see those relationships as critical too.

RTD's Asset Management Accountability Team charter is included in the appendices.

Summary of Steering Capabilities

- They require AM knowledge: ideally have had some training before they start
- They have to understand their role
- They have to lead and be decisive, but also listen to their experts
- They need to take accountability for championing and communicating about AM both at the top table and within their own teams
- Include senior managers accountable for specific assets – including facilities and IT – and (if appropriate) key ISO 55000 clause owners with responsibility for delivering compliance to specific clauses, especially those focused on Delivery

Relationships with other functions

This is a large subject in its own right, but it is worth emphasizing: any AM team has to work closely with all kinds of other teams. AM is not primarily what AM practitioners do at their desks (although there is plenty of analysis, modelling, documentation to be done).

Key relationships include:

- Maintenance
- Operations
- Safety
- Finance
- Engineering & capital delivery
- HR
- Procurement
- Strategic Planning
- IT

Developing relationships with key people in these teams is a major part of an AM team's role, and effort.

RTD AMD did a stakeholder analysis of who we had to bring along with us and what their current attitude to AM was, to understand where we had to do more.

The team is particularly cautious, and prepares very well for any key meeting: what do we need to achieve from the meeting, understanding where the participants are coming from in terms of their priorities and problems, how we can ensure we are all talking a common language. The AMD lead – Lou – spends a lot of time each week with other teams and their managers, building up agreement on plans and actions. (Not every AM practitioner – not everyone else in the team – finds this particularly fascinating).

And as well as thought and effort, one thing we have had to work on is our own attitudes to other groups. It's only human to get frustrated – why don't they see how important this is? – but that frustration doesn't help if it morphs into a sense that we are the sensible people and everyone else is being silly.

This was a horrible problem in one organization elsewhere, where asset people were encouraged by their Group General Manager to consider themselves so much more important than any other function, and essentially not to co-operate with Finance, HR, IT or even Operations. But those all have very effective ways to get back at you... and indeed, they all let the GGM of Assets go hang when things went wrong.

We have to find a way to understand shared values and purpose; and we must respect what they know that we do not. This is not the same thing as refraining from 'calling BS' when it's necessary, but you have to build up the trust, and think about how you are conveying this, for this to be more than a red rag to a bull in interactions.

Humans are fantastically sensitive to anything that feels like "I'm Ok, You're Not" in a meeting...

RTD Asset Stewards and AM Working Group

Business analysts from AMD meet monthly with the appropriate subject matter experts – we call them the asset stewards - to review our asset class strategies and performance reports. The asset class strategies are the primary input into our Asset Management Plan, or AMP.

The Asset Management Working Group (AMWG) is a team made up of the managers responsible for all RTD physical assets, two layers below the CEO. They are technical enough to be experts in their asset classes, but high enough in the organization to have an agency-wide perspective. There are eight voting members in the AMWG to decide on issues about a consistent approach to asset class strategies, with AMD as the tie-breaking vote.

Their task as individuals is to identify renewal projects within their own asset class, to be included in the Asset Management Plan (AMP). Their task as a team is to prioritize the renewal projects across asset classes from most to least critical, based on the agency objectives. The prioritized AMP is now provided to C-suite leadership annually as an input to the rolling 6-year financial planning process.

The AMWG meet twice each year to prioritize the projects in the AMP.



SECTION 2

Making the Business Case for Asset Management

However the decision to establish an AM team or AM practitioner roles is made, we suggest you treat this like a formal investment decision based on a structured business case.

And it is often the business case for Asset Management generally, not simply for budget for positions.

A structured business case, of course, has to answer the following questions:

1. Problem statement: the organizational challenge/s this will contribute to solving, and any benefits beyond this
2. Describe the proposed solution – overview, details (of roles, grades, outline job descriptions, structure and reporting line)
3. What benefits would an AM team/ AM roles provide in meeting these challenges?
4. The alternative options in tackling these challenges with AM (for instance, with different structures)
5. What will it cost (not just to set up, but to operate and maintain, naturally)?
6. What are the risks to manage in making this a success?

Organizational challenges

This probably has two major legs:

- The context, for example of regulation and funding
- Corporate objectives that are not being met comfortably at the moment, or are of C suite concern for the future

The context for a USA transit agency includes the FTA TAM rules, which require a TAM Plan to explicitly include how you are improving AM and what resources you intend to use to do this. The rule also requires agencies to identify resources – the heavy hint being you do need AM resources. (A summary of the TAM rules is included in the appendices.)

Note the FTA Transit Asset Management Guide 2016 also has useful implementation advice, including a section on development of an AM business case.

<https://www.transit.dot.gov/research-innovation/transit-asset-management-guide-2016-report-0098>

For an Ontario municipality, the ON Reg requires a little less evidence of AM implementation and resources, but does include the need for a Strategic AM Policy, as well as who is ultimately accountable in the organization.

For power utilities, there is often a need for a General Rate Case or Application, which is very similar to a short-term capital AM Plan.

All of these clearly require resource to deliver the requirements. That would then focus the business case on how best to deliver them.

Common challenges to corporate objectives include:

- Financial sustainability – fear or knowledge that we do not have enough money to sustain our assets in a state of good repair
- Poor stakeholder reputation, either with customers, funders and/or regulators
- Poor asset performance
- Need to keep developing in order to stay abreast of changing regulations
- Evidence of excessive costs, or at least real pressure to bring them down
- Poorly understood risks and unknown risk appetite

Not all organizations have well defined corporate targets (which is an AM problem in itself), but asking which goals are seen as a challenge is the place to start.

If priorities are not very well defined, you can assume that Cost, Performance, Compliance and Reputation will all be in there, and all are good reasons for better Asset Management.

It is always worth making the connection with Safety, but this is not a central deliverable of AM, unless your problem is your assets are hurting people, or not safe enough (say, if you have issues with track condition). Many safety issues are about the behaviour of people.



Note that at RTD, we do not argue the strategy for AM in terms of performance – reliability – but fiscal sustainability, because in discussion with SLT it was clear fiscal sustainability is their biggest concern. Current asset performance is not a concern generally, because the assets are currently managed to deliver very high reliability, and this is often true for public infrastructure in North America. (But how much are you paying for this reliability – and is the money used wisely?)

Good practice Asset Management is clearly – at least to us – a major contribution to sorting out what money is needed over the medium and long term, and making the justification for more if necessary on a rigorous and defensible basis.

It is also a tried and tested major contributor to improving poor stakeholder relationships.

For relationships with funders or rate-determining regulators, the single most important element is going to be how well you can justify what is required to deliver acceptable levels of service now and into the future, in other words an AMP. If they do not already require something like an AMP, funders will sooner rather than later catch on to this; and it is always a good idea to be one step ahead of them.

The list of such bodies who require not only a plan for investment in assets for 5 years or more, but increasingly demand it is a good plan, is long, and includes not only the US FTA and Canadian province of Ontario, but UK infrastructure regulators such as Ofwat, Ofgem and the Office of Rail and Road, the New Zealand government, and some Australian states. Essentially they all require proof you are doing good Asset Management.

A good AMP also is key to improving customer relationships both directly and indirectly. That is, through better service/ controlled costs over time, but also because having a plan you can explain and justify does make a difference to how you are perceived. (If you don't have an AMP, how do you know what you are doing? How do you defend what you are doing?)

Other kinds of regulators, such as environmental or health and safety, also really like to know both what you are doing and why.

Let's face it, you look a bit of a wally – as we say in England – if you don't have an AMP or you can't explain how you came up with it.

One very famous example about the role of good AM in stakeholder relationships in the USA is how, after the gas explosion in San Bruno in 2012, PG&E Gas used developing and then achieving ISO 55000 and PAS 55 certification as part of their strategy to not only make sure their processes were fit for purpose, but also

demonstrate through third party certification that they were compliant to an international Asset Management standard. Yorkshire Water, in the UK, used AM as the main plank to recover from a bad drought and even more devastating PR disaster in 1995-6.

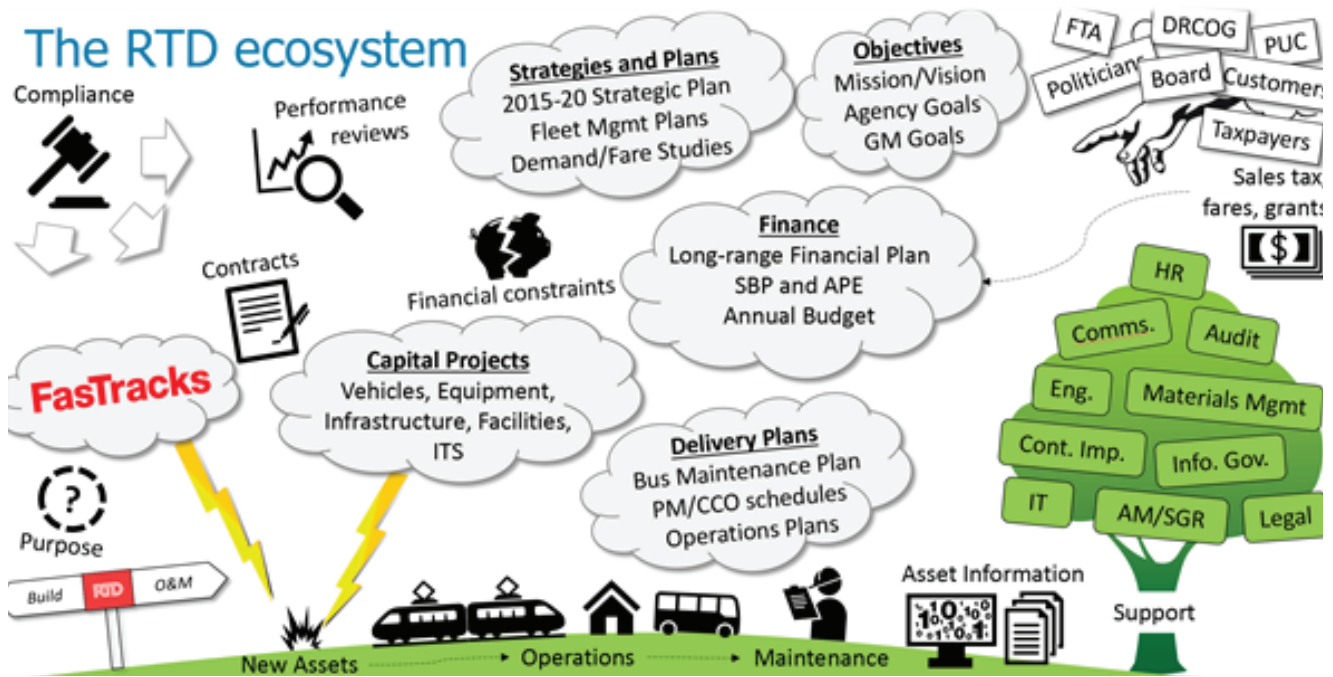
It is worth pointing out early in a business case that Asset Management does not implement itself, and there is not generally a quick fix to major challenges. It is a process that requires decided effort and work.

However, getting a much better sense of what is required to sustain the assets to deliver service, or building better relationships with external stakeholders, can be done within a year or two, IF you have the resources, executive commitment, and know what to do.

For example, with the wholehearted support of the Finance AGM at RTD we managed to produce a version 1 AMP to feed into the overall budget process within a year... after we realized that was a priority.

And setting a course for good practice AM can be used with an external regulator even before it changes much with the assets.

It takes 5 years of concentrated effort on AM to become an overnight success - MARTA's AGM of Rail, David Springstead



How it used to be at RTD

AM as Proposed Solution

We would strongly pitch that the solution is not just another initiative. Time and time again, organizations have come to the conclusion that AM is a framework or management system, not an isolated improvement, or series of improvements unconnected with each other.

At Southern California Edison, for example, it was argued that AM is the only way to bring together initiatives – on beyond initiatives, if you like.

At RTD we used the diagram above of how everything does not currently connect, including random lightning strikes for major capital projects, to argue the way forward for AM.

Structure AMD Structure at RTD

AM functionality at RTD was originally set up with two people in dedicated AM practitioner roles. Over time this was developed into a structure based on Plan Do Check Act, a ‘three legged stool’ of:

- Data Science and Analytics, responsible for asset information strategy and asset risk, and also co-ordinating KPIs for the whole agency
- Business Analysts, responsible for working with the asset stewards and asset SMEs to develop asset class strategies, including support on key data, and for the integrated Asset Management Plan
- Performance Management and Compliance, with responsibility for program management of the roadmap to ISO 55000 certification (as well as those elements of ISO 55000 themselves)

Structure in general

In general terms, an AM team needs to cover these general areas:

- Integrated AMP
- Co-ordinating asset class and site/system functions – the actual knowledge coming from SMEs across the business
- Asset information strategy and support for asset data analysis
- Understanding and leading on asset risk and whole life costs
- Leading and program managing the implementation of the AM system, including communications and training

Each of these require different, complementary skills, and in particular you need to consider how you get the communication and organizational skills for the last one. The integrated Asset Management Planning process is quite a lot of work, as is getting certified to ISO 55000.

Sizing

At RTD, the AMD is currently 17 people, and looks well capable of delivering all aspects of the move to ISO 55000 certification with some targeted external support. There is also a major focus on the AMP and the 'end-to-end investment process' from asset strategies right through to approved budgets and capital program.

That is 17 AM practitioners for nearly 3000 RTD employees and another 2000 contract employees who keep the organization's assets running; in other words, 0.36%.

Looking at what needs to be done, it is hard to see how to have an effective team of less than 4 or 5 people in a medium organization, 3 in a smaller one. And at least one dedicated and knowledgeable AM practitioner in a very small organization.

And note that the need for AM practitioners does not go away after ISO 55000 certification – in fact, it is likely only to increase. There is a lot to do to develop and deliver effective business-as-usual Asset Management.

Asset Management is for life, not just for Christmas - Ark Wingrove

What RTD AMD does all day

This was estimated using our AM roadmap and actually looking at people's calendars, among other things. At this point – halfway through the concerted push to ISO 55000 certification – we are still very task and project-focused. However, we are already into the key AM cycles of the ten-year Asset Management Plan and the feed from Asset Class Strategies – not quite business as usual, as we are still developing these, but they already form the heart of the annual Agency budget cycle.

Current Main AMD Tasks (September 2019)		
Core AM tasks	AM System Manual Complete and approve	
	End to End Investment Process Asset Class Strategies - gen2 Asset Management Plan - gen 2	
	Information Management Framework Define and approve	
	Risk Management Framework Define and approve	
	Communication and Awareness Plan Implement	
	Performance management framework Define and manage	
	Resourcing Strategy Review and improve	
	Management Review AMAT meetings and minutes Tracking log	
	ISO additional	ISO PMO ISO document management
		CAPA framework Define and approve
		Internal compliance framework Define and approve
		Change management framework Define and approve
Compliance	Operational process and control Develop missing or incomplete procedures	
	FTA TAMP	
	National Transit Database	
	Narratives Performance Based Planning	

Building an Asset Management Team

For example, Business analysts for the physical assets work closely with the assets stewards of each asset class to document how they manage their assets. These processes are captured by the analysts in each Asset Class Strategy (ACS). They meet with the asset stewards every month to discuss ways to improve asset management practices for the asset class, including reviewing asset performance and cost data; reviewing upcoming renewal projects; and predicting future funding needs to ensure asset performance remains where it is needed. Here's a typical email:

Thank you again for meeting with me today, I appreciate your time!

As we talked about today, I will be taking over as the Asset Management Business Analyst for all Technology groups, including SCADA, from Dave, who is retiring in December.

I just wanted to send this follow-up to confirm what I got out of the meeting and make sure we are on the same page.

Once I get your updated inventory data, I will get it into the Asset Management Plan (AMP) of all RTD assets, under the category of Technology Assets – SCADA.

Based on your current inventory, you have the following Equipment Types (...)

We have agreed to monthly updates on your inventory, once it is compiled, to show any New Purchases, IMAC and Retired devices (IMAC = Installs, Moves, Adds, Changes) and email that to me as an Excel-compatible report.

Once I get your inventory, I'll follow up with you if I have any questions.

I understand that this is a lot of information to digest in one sitting. We can set up some Skype Meetings to share screens, conference calls or face to face meetings to go over each of the areas discussed and any questions you may have.

Please reach out to me if you have any questions or want to clear up anything listed above that I may have gotten wrong or anything I might have missed.

I will send another email with information about asset policies, inventories and disposal policies and processes as that would be overload for a single email.

Building an Asset Management Team

The Data Science team supports many other efforts as they provide the 'library of numbers for the organization' and helps others understand the context of numbers and their appropriate use or application.

A sample of the work includes:

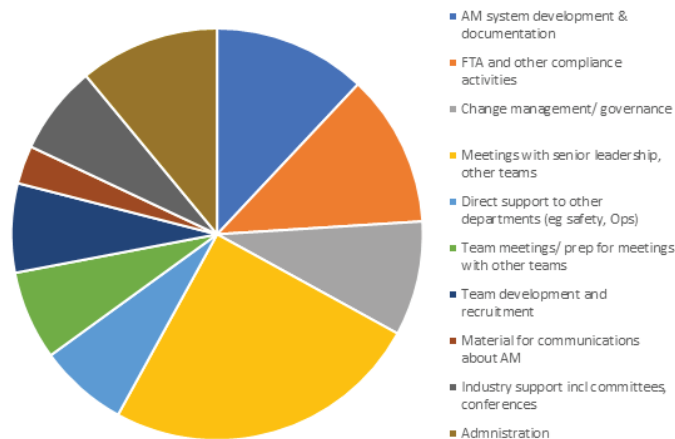
- Asset Information Strategies
- Requirements gathering for project requests
- Data evaluation and analysis
- Review of methods and quality of information
- Compliance reporting
- Data organization and ACS breakdown structures
- Disaggregating and cross-walking financial numbers to assets
- Supporting other agency data and reporting needs such as on-time performance, spare parts strategies and analysis. Data warehouse support and business intelligence support to IT. Development of tools and dashboards to optimize things like schedules, stock levels and even shop use.

The Data team builds the 'maps' of our assets and asset system, where the BAPA's go out into the field explore the actual 'terrain' and feed information back to the data team to increase the accuracy and levels of detail. It is the intelligent corporation between the two teams that helps us deliver a clear picture of our reality now and into the future.

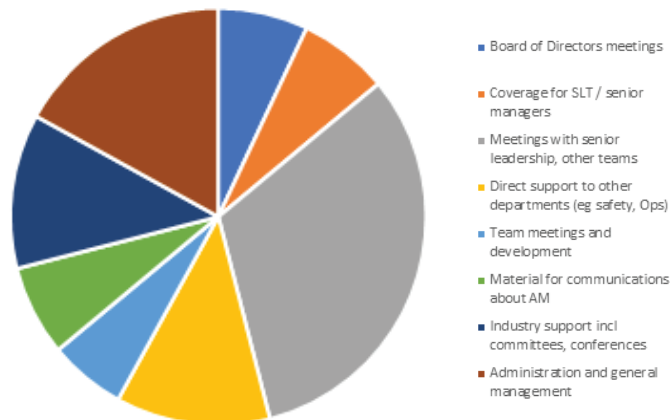
There isn't really an 'average' week – and the Data Science Manager would naturally insist the figures below are rough and indicative only.

Here is a high level view of level of effort for AMD Managers.

AM Division Managerial Tasks



AMD Senior Manager



Benefits of an AM Function

We started this guide by describing why you need a dedicated AM team, and what generally cannot be delivered without it. But it always worth considering putting the benefits both in positive terms – what is possible with an AM function – and the negatives, such as the current muddles, duplications, and lack of progress without it.

Ruth now uses ‘stupidity stories’ to paint the picture of the benefits of good AM: the really stupid decisions even intelligent organizations make without it. The classic ones include rail companies that purchase fleet that doesn’t work on their own tracks – and you can basically take it that every rail agency has done that at some time (the vehicles don’t fit on the gauge, or they won’t go through all the tunnels, or around bends, or through stations, or into the maintenance depots, or through the washing bays).

If you are in a power company, there is a high chance it has refurbished a substation just before Planning decide it needs to be replaced or removed altogether. If you are in a water company, it may well have built a new, larger water treatment works without checking if there is pipe and pump capacity downstream...

You may or may not want to rub the executive’s nose in such examples, but we bet you have them. (One company told me they could match however many stupidity stories I could come up with, with a larger number of their own, and did so in a few minutes). If you do not want to remind them of theirs, mentioning other people’s is always a good look.

Another issue we would bet on is confusion about asset data and asset information systems, and here your IT team may make very good allies against the endless, un-prioritized requirements for more from all sides of the business. You probably don’t want to look too closely at how much effort is wasted by good people, but a benchmark for London Underground 15 years ago found organizations are spending astounding amounts on asset information – and the less good their information, the more they will be spending (through duplications and wasted time to access data).

And to mention something dumb again... it is really not a good look to have major inconsistencies or missing information that is reported to top management, or external stakeholders. Two different ways to report the same thing from different departments, for example. We are not sure why this doesn’t drive more executives wild with frustration, but we know from experience

elsewhere just how mad a regulator will eventually get about missing or inconsistent reporting.

It is also not great as a business not to know how bad your replacement backlog may be, or how fast it is getting worse. What’s the point of the organization in the first place, if not to keep on top of asset issues to ensure they keep delivering the performance that’s required?

It should go without saying that the benefits should be aligned to your business objectives. If fiscal sustainability is the major concern, the case for AM needs to show how it will help to tackle it. We don’t personally fret about AM not completely solving any problem – or pretending it is a quick fix – but it is a major, often the major contributor to a robust solution.

On-time running, for example, is rarely just about asset reliability, because it also depends on people and how you operate the assets (such as having enough bus drivers). However, the agency needs to be able to depend that the buses will be available when they are needed, or getting more bus drivers won’t help.

It is worth reiterating: you will not implement a robust system that can become business as usual, just ‘the way we do things around here’, with no-one to do the work of making that happen. And all the evidence says it won’t happen with uncoordinated activities in different places. AM is, really, a business strategy, and has to be done strategically. Someone has to lead the strategy, and have access to the resources to carry it out.

One possible hazard to mention. Unless you have a very good reason – firm evidence - to believe your planning or delivery of maintenance is poor, and you really understand labor relations, we recommend never committing in a business case for AM to save on maintenance expenditure. It is true that shifting from corrective to planned and preventative maintenance is often extremely effective, as corrective is simply more expensive in general. But you would have to be sure no-one has really thought about this already, to build a case for AM on an Opex % saving.

For many organizations, maintenance will already have been cut, often repeatedly, until there really aren’t more maintenance staff than the organization needs. That is always too easy a place for top management to look for short-term savings.

Framing AM as mostly about cutting maintenance seems to us a poor strategy if you are going to have to depend on them for your data and knowledge of the assets, as you are. It also seems a misunderstanding of what AM is, or what’s really going wrong at the moment.

If you want to address expenditure, the point is that good AM (in close collaboration with maintenance) allows you to right size-maintenance to focus it where it is really needed. And the wasted money is much more likely to be elsewhere, in capital programs or strategic planning. Just saying.

Alternative options

Of course, there are many reasons why dedicating resources to AM is not possible, the biggest being top management do not yet understand the need for AM, or the politics of the organization – by which we mean who wields power in the organization – make a strategic, joined-up solution impossible at this point in time.

Asset Management practitioners always need to take the long view, and take account of power realities, unfortunately. Perhaps the current CEO doesn't get it; what about their likely successor? Maybe the current CEO is simply not strong enough to bring together the various business units; which operating unit or service is led by someone who gets it?

What can you do now, and build towards a better solution in the medium term? Which means continuing to make the case for AM, and delivering some solid achievements, however local. This builds relationships and allies for the long game.

If you don't feel you can make the case at this point for a dedicated, corporate-wide team, you may want to look at a distributed approach – see next section. Or it may be easier to argue for external resources, to provide most of the labor power to a small internal team (see the section below on using consultants). Relying primarily on external resources seems dubious to us, because by definition that isn't a focus on developing in-house skills and knowledge. But it might be a start.

Distributed teams

Many infrastructure organizations are structured into different services or business units: for example, municipalities, multi-utility Public Utility Districts, and (often) power companies. Each service is more or less a separate stream, and there may be very little at the 'corporate' level.

For such organizations, it may be appropriate also to have distributed or networked Asset Management teams.

Vanessa Chau, for example, organized AM in the City of Brampton as a 'CAM Network', with an AM practitioner in every service line (transit, roads, parks, etc). There was

a small corporate AM team to co-ordinate such things as the overall AM Policy and Strategy, as well as training. (Vanessa went further and hosted an AM training program that included neighbouring cities and regions.)

Manitoba Hydro has developed an effective 'Asset Management Practitioners' group of AM practitioners from each operating group (Generation & Wholesale, Transmission, and Distribution) plus ITS and Corporate Services, with one full time AM practitioner at the corporate level. Some of the work, particularly on asset class strategies, is focused in the separate units, but to a common template, and for the AM Policy, SAMP, Asset Information Strategy and Risk approach it was agreed that it made more sense to do them corporately.

For such organizations there can be a tension between what the different units do autonomously and what's common to all of them. This is always a lively discussion about, for example, whether to have one work management system, especially if different teams already have their own.

And there has to be a discussion about what the 'local' AM practitioners are responsible for, along with what the business units can do themselves. Are they responsible and accountable for investments? To actually make decisions?

There needs to be strong governance and a robust decision-making process. What happens if one group wants to diverge from the corporate standard? Who decides?
- Krista Halayko, Manitoba Hydro

Alignment is also an interesting question for more distributed management responsibilities. Are we aligning to business unit targets and priorities, or to corporate? (Are these even clear?) Stakeholder management then probably has to include the relationship between the two.

Are there places where communication isn't happening or could be improved? The answer is probably yes....

Inevitably, how well any of this works is tied up with individuals: the personalities, ambitions and abilities of managers in particular.

For example, Manitoba Hydro includes ITS and Corporate Services AM practitioners in their Asset Management Practitioners group, and this works impressively – the individuals are smart and committed and contribute much to the discussion. This also is to the credit of the managers who selected them, and in

particular to the commitment of the ITS director Rob Lanyon to Asset Management. Not all IT managers are so committed; some argue that IT assets are so 'different', special, IT doesn't need to think about its own Asset Management or play an active part in Asset Management development.

And not all senior managers in separate service areas necessarily care very much about corporate initiatives....

Often one area has already developed some capabilities, or at least tried out some approaches; it obviously makes sense to pick up what they have done to work to share it across everyone. Alternatively, some actively encourage/allow one service or business unit to be the pioneer, because there is particular interest in that unit.

PG&E Gas Operations had its own drivers to implement Asset Management, and pursued ISO 55000/ PAS 55 certification on its own initially; but then PG&E is a very large infrastructure organization. What it has done is share lessons learnt, and some key people, from AM implementation in Gas to Electric Operations, and now sharing experiences in both with Generation.

Moving someone from one business line who has already been involved in Asset Management there, to another one just starting out makes sense. We wonder also about an Embedded role - someone who reports to a completely different team.

For a smaller organization, like a multiple service Public Utility District, we would at least recommend that other teams take an active 'watching brief', or even set up a formal cross-group AM Steering Committee with a representative from each service.

And if you can't do that, at least ensure that any lessons learnt are shared.

Another thing we've heard people say is that they wished they had put more people through training early on.

Possible downsides to very distributed models of Asset Management could be a lack of commitment and direction at the corporate level - and getting dragged too much into Delivery and immediate & tactical issues.

Lou: distributed or networked teams perhaps could plan ongoing consultant support to provide the outside look and help drive balance between the areas. This could be in the form of a few times a year check-ups, coaching / counselling, and training sessions. To get everyone back on the same sheet of music.

However you do it, departments and AM practitioners need to understand not just what but why they are doing it. If they clearly understand the mission, purpose and goal of their work, then they will be more motivated and actually feel empowered to make decisions.

One company we know recently dissolved their small corporate AM team to devolve everything to the business units, which didn't feel like a progressive move to anyone in their AM community.

A favorite lesson learnt from one distributed business: "If we had our time again, we'd have one person - just one - who actually liked talking to other people. They wouldn't have to be good at it, just prepared to do it..."

Building an Asset Management Community

Above all, however you organize it, you may want to consider building an AM community – of interested individuals – that extends beyond formal job titles. The FTA has coined the term ‘TAMBassadors’ (ambassadors for Transit Asset Management). Other organizations call them ‘communities of practice’, and they will obviously be useful if you have any kind of distributed model of Asset Management. But we think they can be even more than this.

For example, Yorkshire Water, a very early adopter in England, had a two day AM conference internally of everyone interested once a year to share experiences, learn lessons, and discuss what to focus on next.

You may not always be able to predict where in your business you will find active supporters in other functions who want to be involved in Asset Management – but the chances are they will be there. How about involving them through lunch and learn type discussions on key topics?

Such people can be champions for AM in their own teams, as well as taking the lead on anything their team needs to contribute (for example on asset class strategies, or capital processes). Good Asset Management is more than an AM team, so we need others who understand and want to see it happen.

And don’t assume some don’t already know about it: smart maintenance people may well already have a view on optimization and lifecycle management. (Ruth recalls a first briefing on AM to a maintenance shop in which the team leaders said, if we’re serious about this, we should steal the Asset Manager from a neighbouring utility – they already knew and admired what he was doing.) At RTD, for example, the new CFO had experience of Asset Management in another agency, that we discovered the first session we had with the senior leadership team about it.

Those interested people in other teams could also be good territory for recruitment – RTD AMD, for example, got one of its managers from corporate communications, through involving him in discussions to which he could contribute his particular expertise and experience. Others have also applied for AMD jobs because they like how it works and what it is doing.

Using consultants

It's probably true that almost every AM team makes use of third party consultants at some point. And at the very least should be using them for initial training, and the occasional third party maturity and program assessments.

It may be tempting to outsource your AM competency to consulting firms. They do have a larger pool of expertise – not hundreds with real experience, but more people than you will typically find on the job market – and can get your agency up to speed quickly. However, there is a trap here: if you are not careful, you end up with a product and not a process, or any internal ownership and knowledge to sustain it.

One challenge is the complicated procurement rules of large companies that are built for 'buying widgets' at the lowest cost and do not work well when you are buying expertise.

Don't use the same procurement processes that you would for buying goods. You want the best expertise that money can buy – and it will save you in the long run

Another issue with consultants is just like using any other external resource: if you don't understand what you are buying, it's hard to make the right choice. AM pioneer David Ford used to say dumb client, dumb supplier... There are a few unfortunate examples in the USA of organizations who relied on particular consultants who knew essentially no more than their clients, and sold whatever they already knew as Asset Management.

This should be less of a problem now a general understanding of AM has grown, but it still suggests that networking – talking to your peer agencies about what they have done – is essential, so that you get a sense of what you really need. We don't mean just using the consultants they used, but more generally discussing what you are looking for, and what you can expect.

Some organizations in North America are beginning to make use of formal qualifications and endorsements, requiring of any third party that they are Institute of Asset Management endorsed trainers or assessors, and/or that their personnel have IAM Certificates or even IAM Diplomas. (There are also Australia's Asset Management Council qualifications you could require.)

Professional registration of AM practitioners is not yet in action, although hopefully this will be there in 2020

in some places. (Note that AM practitioners in Ontario successfully argued the Provincial Government out of requiring that a professionally registered engineer sign off on Asset Management Plans, on the promise that there would sooner rather than later be an alternative.)

The message here is: much as we look for qualifications and other credentials when evaluating technical experts, we should do the same for Asset Management services.

Use of consultants in RTD AMD

RTD has had a good experience with targeted use of consultants.

We originally got the team trained in the IAM Certificate from one of the handful of organizations who we felt offered real AM training, and support for taking the IAM Diploma from another. (Afterwards, we wished we had all taken a full-blown Diploma course.) If you get training from someone who has many years' experience of Asset Management, it's not simply being taught the concepts, but an active discussion about how to exploit what has been done elsewhere. It's like being inducted into the wider community.

It is about gaining the knowledge – not just about getting certifications – and we would both argue it actually helps to get examples good and bad from a range of sectors, not just your own. Companies often say they want 'targeted' training, but almost always change their minds after they have seen the wide scope of AM. And realize what they can learn from other places and types of assets, in understanding the concepts in a broader perspective.

Almost everyone has a wider range of assets that they may normally think about – everyone has maintenance tools and depots, fleet, some discrete and some system assets, for example. Encouraging everyone to grow their awareness of the differences as well as similarities between different types of assets is, to us, key to good AM.

(The IAM website has a list of companies that provide IAM approved training; in practice, a handful of organizations provide almost all the AM training across the globe. There are alternative routes, via the Australasian AM Council or through NAMS, the latter particularly influential in Western Canada.)

At RTD, almost the most important thing we learnt from solid AM training (IAM Certificate in our case) was how much we didn't know. It really helped us in developing our own thoughts on what we needed and where we wanted to start. After our initial training we decided the next step for us was to have a 3rd party gap assessment performed so that a roadmap and schedule could be

developed. This roadmap would become our plan to systemically improve AM across the organization. None of this would have been possible without the training.

At RTD, it was Chuck Austin who first achieved an IAM Certificate, and he set up study sessions with an informal book club format. It was during those lunch sessions that we committed to the Institute of Asset Management and ISO 55000 perspectives on AM. It was because of this commitment that we wanted people who had worked with both.

Like most infrastructure organizations, we had only a limited budget for consultancy support, and that that drove us to think more sharply about what we wanted and what would bring us the highest value. We went for people who had a lot of specific AM experience, including experience outside USA where organizations have been doing Asset Management for longer. It gratifies us that we work with people who are closely connected to the very first pioneers – such as Penny Burns and Roger Byrne, as well as Chris Lloyd – and are part of a developing tradition and chain of knowledge.

Using an organization dedicated to Asset Management suits RTD. This is not to say that large general engineering or management consulting firms can't deliver good AM consulting services, but all things considered they didn't seem to be the best fit for us (and frankly some were well beyond our budget).

Ruth: an endearing feature of RTD AMD is how hard they worked to convince bidders they were serious about AM, in the belief that showing RTD's commitment would encourage commitment from the consultants. I think they are right about this, as consultants certainly do get views on whether a client is really wanting to change, and commit resources accordingly. And of course it has to be a two-way relationship; a client that doesn't really care isn't going to get a very caring relationship with a consultant.

In general, we've found we can make use of about one week of consultation in every month of the team's work. We never wanted embedded resources, and aimed always for speedy knowledge transfer into the internal team. We'd love to say our particular successful partnership was due to our good judgement, but it may also involve some luck...

Generally, we are looking for people to impart their experience and ideas to us, rather than produce stuff for us – although we have made use of communications, writing and design skills from our consultants, because such skills turn out to be very useful in Asset Management.

An observation: the TAMPs produced by consultants don't seem nearly as sharp as those produced internally, such as those at BART and Sound Transit. That may seem hard on agencies who have not yet built up their internal capabilities, but it is probably inevitable. We did make use of our consultants to help review, edit and design the RTD TAMP, but it feels like ours. And we learnt valuable lessons (for instance that not everyone smart can write – and it's important to have a distinct voice for key documents, not a patchwork quilt of inputs) about how to produce strategies and plans internally, that we made use of in developing our SAMP.

If you know Lou and team, you'll already know we think we have a great partnership where we get the acceleration of delivery, improved quality, direct exposure to people with years' of experience from which we can learn and improve... but there are lots of bad examples out there where it was not a happy ending.

Some rules of thumb in using consultants:

- Aim to tap into real AM experience and expertise
- Think processes, not products
- Use to speed up developing your internal capabilities
- If possible, don't get consultants to actually do your strategies and plans (the key word is 'your')

Of course, you can also embed an external resource into your organization, just as if you were hiring someone. You probably should treat this in a very similar way to recruiting – the same kind of questions to seek out the same kind of capabilities.

Note on costing

You will want to work with your Finance team to develop a justifiable cost model for the team. It's a recurring budget item, in other words operating or revenue costs you are talking about. We assume from every experience around the world that AM does not go away, but rather needs to become business as usual, (BAU) in terms of a small number of asset planners, information support, business analysts, communications and facilitation, and maintaining good asset strategies once you have developed them. But you can start smaller than you suspect that BAU activity will really be. (Start from where you are and work towards the optimal solution.)

It is probably always hard to quantify in \$ where you are spending - wasting - on resources without a strategic and coordinated approach to AM, but you will be. Unless you are very bold, the \$ case probably has to be made on how little extra it costs to have a small dedicated AM team in comparison to how much better it will all work in five years' time, for example with an integrated AMP.

Your asset management team is more like a 401K investment plan, where money invested over time creates compounded returns over time. Also like a 401K, you can't buy time: starting, even small, now is usually more important than waiting a decade and throwing a lump-sum at it.

How big is your overall asset spend, compared to how minor a small AM function will cost? As they say, even a small % benefit of a very large number will look worthwhile. Your organization almost certainly does not put a \$ value on how bad its relationship with stakeholders is, or how much risk there is at the moment – because, basically, you have to be already doing AM to understand this. Don't go mad on spurious \$ figures, but stress just how important stakeholder relationships, sustainable funding, understanding asset risk are to your organization.

Risks to success

- Insufficient management commitment and leadership
- **Insufficient management commitment and leadership**
- Hiring the wrong person as AM lead
- Not giving it enough resources to be able to put in the sheer people-hours required

The background is a solid yellow color. Overlaid on this is a white line-art illustration of a hand holding a pen. The hand is positioned in the lower right quadrant, with the index finger pointing towards the center. The pen is held between the thumb and index finger, and its tip is directed towards the center. The lines are thick and fluid, creating a sense of movement and focus.

SECTION 3

Recruitment Approach

General Principles

The basic approach is to find, hire, train, promote, and keep good people. It seems obvious, but hire good people and treat them well. Set high expectations and make the 'why' crystal clear behind actions and plans.

Give someone a why and they can bear almost any how – Friedrich Nietzsche

We both had experience of recruitment before we got involved in AM and AM recruitment, and that helped us. What we aim to do in this section is cover some of what we have found works as an approach to getting the right people.

To begin with: what are you really aiming for? We think these are the basic things you are looking for in the process when you hire anyone, internal or external:

- They understand the job
- They have the right skills, knowledge, and experience, and personal attributes to do the job
- They are motivated
- Their fit and the overall balance in the team, including diversity of people and perspectives

Asset Management implementation is hard: we need A-players. Don't compromise here. You owe it to the company and your team to build the best team possible. Oddly enough, this will help you make yours the team to be on. A-players want to work with other A-players and do meaningful work.

Even before you put out a job posting, consider how to reach people, to get them open to applying even before there is a job opening to apply to. This is essentially PR on behalf of AM, and your AM team.

Having a recruitment strategy helps us develop plans, but also necessitates that we continue to push to improve this process. Our approach is targeted to build the best team for now and a five year horizon.

Some principles RTD AMD uses:

- We will work with HR to improve processes that feed into our strategies
- We try never to be desperate to hire, because this leads to potentially poor decisions
- Plan to market the division and organization. What is the differentiator for our team or organization?
- Our plan includes treating applicants how we would want to be treated throughout the process.
 - Don't let great candidates sit in the dark – let them know what is happening, give them information on our process and the timeline. (This is often hard – HR processes can be cumbersome and slow.)
- Plan to pay for value-added
 - Invest in people and consider the costs of missing out on the A-players or in hiring poor performers. This will help make the case to pay a establish a competitive wage.
 - It is a competitive market – have the discussions with HR beforehand to benchmark what you want to pay, even if the grade is set. Understand the pay equity concerns they have within the organization. Use the applicants' overall scorecard to make this case.
- Look for 'Fit and Balance'
 - Understanding your team culture and skills lets you round out the team with hires. People that don't fit in won't be happy, and you both lose.
- Focus on individuals and not on groups.

Lou: attracting millennials isn't a strategy. I know the stats... 'Half the workforce by 2030 will be millennials', 'we need to be like Google'. I disagree. Hire the best, many of whom will end up being millennials. Remember new 40 year olds are being minted every day.

- Learning from the people on the team
 - What makes them great, special, successful? Values, intellectual horsepower, curiosity, grit, openness to changes, learner, character...?...
 - Test the tools and interview questions on the existing team. If the high performers don't score high, then the measures are wrong. Plus, they are involved with the process, and as a leader you learn more about them.
- Use the information gained in the hiring process
 - Measure time to hire, evaluate test scores, and use the most successful hires to determine what works and what doesn't
 - Use to find new veins of talented people (see the section on where to look for good people below)

We hire people who can do the things we need done now, and will be able to tool up and do maybe different things in five years' time, as AM continues to evolve in our organization. We are in a changing landscape,

but are our organizations ready to hire on that basis? This may need to be rethought in the future, when (if) AM is business as usual, as people who thrive in fluid environments don't do so well with repetition.

Lou: my hope is to keep great people for as long as possible. A rule of thumb I like to follow is: hire as if the person will stay for 10-30 years. This helps me stay in the best mind-set for hiring. If the person isn't a "heck yea", pass and keep looking.

This can be another challenge, especially in the public sector. We will invest too much time and unproductive effort dealing with issues if the wrong people are hired.

There is a lot to be said about moving people from poor performers or problems to good employees. We need to try to manage this through high expectations, quarterly evaluations, and not tolerating low performance (sometimes there is nothing you can do, but that is rare).

There will always be a turnover of staff, not least through retirement. A sustainable team will need not only a replacement strategy and plan for the latter, but also a knowledge capture and management strategy (which is not currently in place in RTD AMD).

We must be clear about the functions of AM ourselves before we can find the right team. It seems clear to us we are looking for a blend of natural ability combined with skills and the desire to improve themselves, and something else.

When we first formed our new asset management sections, we handpicked people that had all the skills that were needed and we asked them to join us. I feel that if you are stepping out of your technical comfort zone to do AM (which is new and undefined) it takes a certain kind of person – someone who is willing to take a leap of faith. Some said no, but the ones who said yes were the right people.

Usefully smart people

- Know what they don't know, and will say they don't know
- Can bring in knowledge from unexpected areas and see how it fits, before others maybe grasp that a novel approach is needed
- Will use discussion and disagreement to work out hard or difficult thoughts
- Will tell you when to stay in your lane
- Understand that changes to systems have unintended consequences

Warning: There will be times when you are sure you already have the perfect candidate for a position because you know them and their skills. This is great because, if true, they will have no problems competing for the job. But it can turn out that they are not actually the best candidate on the day. Some people we already knew, and liked, at RTD have competed and won job appointments on their merits - while others have not.

And we should not have to say this, but: don't take a second-best candidate because they are internal, or someone's protégé. You need the best people you can find.

Where to look for the right people for the team

All industries are looking for talented people who could and will do the necessary work. But just posting a job isn't looking for people. Randomly spreading seed doesn't make you a farmer. You need to do more.

One example is making use of older maintenance people with lots of experience, smart, thoughtful people who are wanting to move on. Age is a motivation to move away from physical work. We have found success in this area by looking for people who have kept their skills sharp and continued to learn.

We also go searching for talent. We have had people visit job fairs, military centres, and universities. We are also creating a network of people who are outside of AM that help us find the people we need. One example is a professor friend Lou called about a data analyst position. He recommended the job to a former student, even though this wasn't in his current field (agriculture), but recognized it might be a good fit for him. He was an amazing find, and it seems that the position is working well for him as well as us.

Another potential source is people who aren't necessarily looking for a new job. When you find great people talk with them about your team. Be upfront that they would need to compete for the positions, but that you are always on the lookout for talented people. When you post a job you can nudge them to read the posting.

The entire team can talk about future opportunities and will share your culture, good and bad. Most of us want to be part of something meaningful. Encourage your people to talk about what it is like to work in Asset Management. We get applicants for our positions that want to come to our team, and we are convinced this is why.

Create your mailing list, because even if it isn't a fit for them, good people know better people.

This raised the question: Where else should we be looking, and what skills are transferable? We have taken all the best previous applicants and recorded the industries they have worked in based on their resumes. The last batch of applicants included a surprising number of people who had experience in the health-care industry. We are also starting to see more applicants that have experience in the oil and gas industry. (This could be partially driven by the continued depressed investment into oil exploration in the region.) The point is, that we need to be thinking about the factors that motivate great people to look.

We have had people on our team with military, construction, automotive, market research, aviation, IT, finance, mathematics, electrician, engineering, rail infrastructure, small business owners, rail vehicle maintenance, accounting, agribusiness and more. We talk with them to understand why they were looking, and what they were looking for.

Assemble any group of asset managers (perhaps someone can suggest a collective noun) and you will find most are organisational anywhere; - people who migrated from engineering, operations, maintenance, and a few from far, far lands such as customer services and even finance (and we still need far more of those). Often they migrated for interest, advancement or because they want a new challenge.

Ark Wingrove, What Global Citizens and Asset Managers have in common, www.wanderingassetmanager.com June 18 2019

We could use this knowledge to our advantage by including those key words and sectors in our recruitment posting. This should help us get our job posting in front of more of the 'right' people. And improve our ability to exploit the emerging and growing technologies around recruitment.

For team leaders, maybe look to those with leadership experience in the military? Of course, the single best place to look for effective leaders is in other departments in your own agency.

Leading in the non-profit realm isn't easy, and often can't pay well; but it can appeal to people who want to work on something with greater meaning.

The AM community will grow in knowledge and skills as we expand our base of experience. We need to have people with wildly different skillsets and experiences to push us forward. We will not get that sitting back and waiting for people to apply for our jobs. AM practitioners are proactive and have a plan, we execute it

and, if it doesn't deliver what we expected, we improve it. That is why this section, this overall document will never be done!

The procedures used are an aid in providing the team with the most qualified employees possible. Personnel who are chosen for positions for which they are completely prepared to succeed at will be the happiest and most productive.

Some tools

Skills Matrix & Scorecard

RTD AMD made heavy use of a skills matrix: that is, a table of the skills, experience, attributes we need overall in the team, which we then tailor to a particular job (in other words, think which subset is important for the role).

We keep an up-to-date record of the total of what we have - a mix of what's required for each role and what current individuals have - which also makes it easier to work out what is missing, especially when someone moves on, and very useful in drawing up job descriptions. And the same structure is used to score applicants on skills, from their application through to the face to face interview.

The first pass was based on the 39 Subjects from the AM landscape or IAM 'Anatomy', but we didn't find all 39 topics equally important for an AM team.

The scorecard for a particular applicant for a particular job includes both how they score on the skills, and on their answers to the interview questions, both written and face to face.

Written Interviews

We also employ a more complex selection process than most jobs in RTD, not only including a test at the time of the face to face interview for specific appropriate skills, for example for a data analyst, but also a written interview before this. We send out a list of questions to applicants for them to complete and return before we select people for interview.

For both the test and the written interview, we are not only look for right answers, but in some questions how an applicant tackles a question that has no right answer. The written interviews have worked brilliantly to select people who are curious and open to new things, who can handle problems with no right or easy answer, and simply to test if they are really interested. A recent successful applicant told us he got more interested in the job when he saw the interesting questions. Others

didn't bother to answer them seriously, assuming this was just a formality; it is not. (They did not get selected for face to face interview.)

This works for AMD, and you can make use of any of our resources; but the real point is to work through what kind of person you want, and how to test for this in a short process. We think it is worth being creative, since AM requires creativity.

Seek out the extraordinary. No one person is good at everything. Often those with extreme ability in one area are mediocre or lacking in other areas. By seeking out those at the extremes of the normal curve, the extreme performance on complementary areas of performance, a synergy can be found

Dennis Yaklich, Data Science Manager, RTD AMD

Summary recruitment principles

- Recruit only great people, or pass
- Use a structured, active, thoughtful process in recruitment
- Do the work to find the right people - you can't outsource this
- Cast a wide net: to attract as many of the most qualified candidates for open positions as possible
- Describe and communicate the process to applicants
- Communicate expectations: provide the candidate employee with useful information about the position and its responsibilities
- Remain detached during the process and trust the results
- Eliminate any inappropriate or even the appearance of bias from the hiring process
- Distinguish between likes and needs
- Ethics and values don't really change in people; never compromise on these

A custom home builder, former BMW tech and market researcher all walk into a bar... and arguably you have one of the best AM teams in transit.



SECTION 4

The Recruitment Process

Recruitment at RTD is a process or a series of recruiting and on-boarding steps, including communicating relevant job details and expectations of positions. It is also our opportunity to start learning about and measuring the attributes and skills of each applicant.

Working with HR

RTD's AMD has been allowed to use our own modified process for recruitment with the help and support of HR. There isn't a short cut to good hiring. You can't recruit the best people if you do not do a lot of work.

We discovered that old processes seemed unlikely to find us the best people. HR people are generally great referees to the process, keeping you from breaking any laws and flagging any potential hazards. They may not know what or who we need on our teams, or how best to attract and select them.

You can't outsource your most important tasks as AM manager to another group and expect excellent results. This includes outsourcing hiring to HR.

Who does what at RTD in AM hiring is included in the appendices.

Summary of RTD AMD Process

1. Set up a scorecard for the position
2. Job description – Using HR templates
 - Title
 - Pay – how to think about the range
 - Positioning us – agency, team culture
 - Functions/ job description
 - People specification
3. Development of any specific tools, questions, skills tests and determine selection team
4. Agree when, where and how to post (deadline and timings for interviews to schedule people)
5. Select panel: we use two or three (not all AM, equivalent skills in other teams) plus HR, and settle on interview questions to use
6. Post job
7. As applications come in, use scorecard to rank and exploit ‘natural break’ between likely and unlikely candidates– (usually not difficult) – and fast track obvious good candidates
8. Respond – non-canned / personalized – this is another marketing point; describe the interview process, timings, interview slot
9. We assign identification number, remove name, demo, and identifying details so panel won’t favor people like them, or that they know
10. Written interviews – actually matter for AM that people will find this interesting/ smart/ motivated (even from the field) – sense of person to use in face to face interviews
11. Selection on written interviews using scorecard and grading matrix (AMD has a document for the panel on how to use these)
12. Test and face to face interviews
13. Complete scorecard
14. Don’t necessarily pick the highest score – use panel judgment on fit with the team as well, usually on the top two
15. Let your first choice know you are preparing the offer
16. Go through HR standard process including EEO compliance, and agree pay offer with HR – we believe in the ‘best we can offer’, and don’t negotiate because what does that say (and think diversity – women, for example, tend not to be so aggressive about trying to push up the pay offer as some groups of men)
17. Offer letter with a proposed start day
18. Background check, drug tests
19. On-boarding
20. Update team scorecard
21. Check, Act – learn from who is really successful, who doesn’t work, fine-tune general scorecard, questions

Developing Job Descriptions

To build a team of the best people we need to find each other. How we describe and market-position our jobs frequently revolves around job descriptions. It is a tool and should be designed and treated as such.

A job description is the list of the major duties, responsibilities, and relationships of a position. In its simplest form, job descriptions indicate the work or functions assigned to the position. An effective job description will provide sufficient detail for the applicant to determine if they're qualified for the position, and if it is something they are interested in doing.

One of our goals then is to strike a balance between providing enough detail for applicants to understand the role and keeping the document concise. The latter isn't a problem at RTD as we have HR imposed constraints as to the length and number of essential functions. Our friends at WMATA have found a nice balance, and we have included one of their job descriptions in the appendix.

We also believe a job description should include important company and division details, including describing culture and benefits we offer. At RTD we don't currently have this section in our Job Descriptions, but plan to work with HR to add it. This section is a chance to sell the job, company, and division to the applicant, including putting out our values. This is the opportunity for applicants to understand and check for alignment with their expectations, desires, and personal values.

This is another area where resources are widely available to help develop better job descriptions, but here is a basic outline of the process we use in the RTD AMD.

- Review current Job Descriptions
- Utilize the position function matrix create lists of:
 - Major duties
 - Responsibilities
 - Relationships
 - Skills, knowledge necessary
- Evaluate other similar position/ job descriptions with meaningful content (These are job descriptions that are found and collected from across multiple industries, mostly focusing on Asset Management)
- Adjust content to be relevant to RTD's functions and needs from the scorecard
 - Identify and focus on the 'Essential Job Functions'
 - Put functions in relevant rank order
- Group the Essential Job Functions into several different areas.

- Example groupings:
 - Strategy & Leadership
 - Data & Analysis
 - Training
 - Continuous Improvement
 - Assurance, Governance, & Risk Controls (Compliance)
- Use collected information and the HR template draft the job description
- Circulate for errors, omissions, and improvement and review with HR

Avoid using abbreviations and acronyms: spell out the term whenever possible to ensure everyone understands them. Remember, we want to pull experts from other industries, and not all great AM practitioners have transit experience, for example.

Warning: Don't write job descriptions for specific people. Write about what you need. If people believe the candidate is already selected, it damages your credibility, not to mention your commitment to equal opportunities.

Job Titles

When developing your job description use targeted job titles instead of more generic ones. For example: 'Asset Planner' wouldn't be as useful as something that included Physical Assets Planner or Physical Asset Business Analyst. Be precise by including titles that accurately describe the role.

One challenge here is that these job titles may not exist in keyword searches done by HR in determining salary or industry comparisons. As a default, they might look up general 'business analyst' and find positions that do not provide a fraction of the same functions, so a conversation will need to be initiated with HR to help them find comparable.

This is another reason why it is important to have a continuing dialog with HR providing them with why we are selecting job titles that may not be generalized. We hope that, over time, these job titles will become more standardized, and comparable positions will be easier for HR to find.

Lastly, avoid internal lingo that may confuse the applicant. Use standard experience levels like 'Senior', rather than 'Grade II' or other internal terms external applicants are less likely to look for (or necessarily understand).

Scorecards and skills matrix

A scorecard and skills matrix are two of the tools that we use at RTD during our recruitment process. It is our way to catalogue and measure an applicant's knowledge, skills, and attributes during the recruitment process up to the start of on-boarding.

Once we have an approved job description, which uses the skills matrix to capture what is most important for the specific job, we build a scorecard which is used to measure and evaluate applicants. (Geoff Smart

and Randy Street's book Who does an exceptional job describing how to build scorecards specifically targeted to leadership roles.) We have included a variation of AMD's skills matrix and applicant scorecard in the appendix, with notes on scoring.

Here is an example of an applicant scorecard used by the hiring manager to collect and transcribe the scores throughout the process.

- The intent is to easily compare applicants' qualifications, essay and interview scores.
- There would be one document for all applicants

Here is what the final scorecard looked like for one position:

Show	ID Number	Test Y/N	Interview Y/N	Bachelor's degree in Business Administration, Design Science, Mathematics, Analytics, Engineering or a similar discipline. Master's degree preferred.	A minimum of three years of experience in statistical analysis or data analysis; the ability to compile, code, categorize, calculate, tabulate, audit, and verify information and/or data.	Proficiency in research and data analysis with close attention to detail and problem solving skills.	A minimum of five years of experience with software such as Oracle ERP modules, OBIEE, IBM SPSS, Minitab, SAS, JMP, Genstat, STATISTICAL, IBM SPSS, LINDAP, LISREL, NCSS, SignStat, Stata, Statgraphics, StatDirect, & Project or Unistat.	A minimum of two years of experience in a supervisory position.	Ability to interpret the meaning of information for others – translating or explaining what information means and how it can be used.	Proficiency in economic and accounting principles and practices, analysis and reporting of financial data.	Proficiency in business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.	Ability to manage time and workload effectively which includes planning, organizing, and prioritizing with attention to details.	Total Nbr of Entries ->		Yes = 3 Maybe = 2 No = 0	Group "Yes" (Track 10)	Rank Weighting									
																	25.0%	35.0%	35.0%	10.0%	100.0%					
	0022	N	N	N	Y	Y	MAYBE	N	Y	N	N	Y	17	43.8%	1.00	43.8%	8	43.8%								
1.00	0023	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	27	69.2%	1.00	69.2%	8	69.2%								
	0024	N	N	N	Y	N	Y	Y	MAYBE	N	MAYBE	Y	18	46.3%	1.00	46.3%	8	46.3%								
1.00	0025	Y	Y	Y	Y	Y	Y	NO	MAYBE	Y	Y	Y	23	59.0%	1.00	59.0%	8	59.0%								
1.00	0026	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	28	71.8%	1.00	71.8%	8	71.8%								
1.00	0027	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	28.01	71.8%	1.00	71.8%	8	71.8%								
1.00	0028	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	33.01	82.1%	1.00	82.1%	4	82.1%								
1.00	0029	Y	N	N	Y	Y	Y	MAYBE	MAYBE	Y	Y	Y	25	64.1%	1.00	64.1%	8	64.1%								
	0030	N	N	N	Y	N	Y	Y	N	Y	Y	MAYBE	17	43.8%	1.00	43.8%	8	43.8%								
	0031	N	N	N	Y	Y	Y	Y	MAYBE	MAYBE	Y	MAYBE	Y	23	59.0%	1.00	59.0%	8	59.0%							
1.00	0032	N	N	N	Y	Y	MAYBE	MAYBE	N	MAYBE	Y	NO	MAYBE	17	43.8%	1.00	43.8%	8	43.8%							
	0033	Y	N	N	Y	Y	Y	Y	MAYBE	MAYBE	Y	MAYBE	17	43.8%	1.00	43.8%	8	43.8%								
	0034	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	24	61.3%	1.00	61.3%	8	61.3%								
	0035	N	N	N	N	N	N	N	N	N	N	N	20	51.3%	1.00	51.3%	8	51.3%								
	0036	N	N	N	Y	Y	Y	Y	N	Y	Y	N	21	53.8%	1.00	53.8%	8	53.8%								
1.00	0037	N	N	Y	Y	Y	Y	Y	MAYBE	MAYBE	Y	MAYBE	29.01	74.4%	1.00	74.4%	3	74.4%								
	0038	Y	Y	N	Y	Y	Y	Y	MAYBE	MAYBE	Y	Y	25	64.1%	1.00	64.1%	6	64.1%								
1.00	0039	Y	N	N	Y	Y	Y	Y	MAYBE	Y	Y	Y	31.01	79.5%	1.00	79.5%	1	79.5%								

(Note this was the final group of applicants)

Individual Contributions

Each is important, each comes with effort, preparation, risks, and rewards:

Leader: The pathfinder, aligns efforts to get from here to there, to connect others in service of a common goal. Setting an agenda, going to new places and tackling unknowable obstacles. Has the map, knows the terrain and takes us into the forest to slay dragons.

Manager: Coordinating the work of others, with a focus on taking responsibility. The leader can set an agenda, the manager makes day to day decisions to ensure it gets completed. It's been done before, but you can do it better. They often lead people and teams but manage projects and tasks.

Communicator: Turning a maybe into a yes, enrolling others in the long-term journey of value creation.

Skilled worker: Applies expertise and delivering unique work that others can't (or won't).

Contributor: Showing up and doing what is asked, maintains commitments made on your behalf.

Communication with applicants

If you put yourself in the shoes of the applicant – and remember that you are selling them the job, as much as they are promoting themselves for the job - it becomes clear how important clear, accurate, concise communication along the way becomes.

In RTD AMD we believe from the day an applicant applies for a position, we have the opportunity and obligation to make it a positive experience. Even if we don't hire them for this position, we aim to improve their impression of RTD, and AMD.

Lou: I am convinced it is one of the more important things that all companies could do to improve the quality and retention of their hires. Communication is accomplished through intentional effort and deliberate messaging. If I ever doubt what to communicate, I ask myself: "if I were the applicant, what would help to know or understand?"

HR has software systems that automatically send replies like "Your application has been received", but this is only

a fraction of what good people want. This communicates that our computers captured something from you, and not that people are considering your application.

So, for example, we send another email that indicates that we have your information, and it is with a person. We thank them for applying and introduce them to our process.

This can make HR uncomfortable because they may prefer that all communication is filtered through them, so we ensure they have approved the general messages we send, even though each are personalized, and we copy HR in on each of the emails sent. Direct communication is an area that has taken time to build trust.

The single biggest problem in communication is the illusion that it has taken place – George Bernard Shaw

In our early communications with applicants we set expectations about communication channels, and the types of questions that need to be directed to HR.

Communicating the 'no thank you' afterwards

Lou: I start by again thanking them for the time they invested in our process, and tell them that it was nice to meet them.

"The decision has been made; and, yes, I will meet with you and discuss why we didn't select you for the position." These are important conversations, even if some feel they don't add immediate value and take up time in preparation and for the meeting. You will learn a lot about the people you didn't select going through this, and it will make you better on your next hire. They are also very important for your relationship with any internal applicant – people you will be working with in future.

I am honest and direct with the answers: here are your strengths and the things we liked, and here are the things that were perceived as areas you could improve. Make no promises and don't walk back your observations. Be prepared for some uncomfortable silence.

Take time to listen, too; you are delivering difficult news.

I had one internal candidate tell my manager in front of a room full of AGM's that it was the most useful meeting he has had with anyone. That meant a lot to me, because I told him some difficult truths about why he wasn't selected.

Interviews

These are a series of exercises and interactions aimed at finding the perfect match. How do we test to find the A-players?

Ideally, we are looking for people who ask themselves why we might be asking a specific question. They put themselves into the seat of the interview panel, and consider what we would want to know about them. This awareness makes good AM practitioners.

Some questions are not asked because we want a specific answer. An example, in one of our interviews for a Data Analyst, we asked a Fermi-based question: "How many pairs of women's shoes might be sold in Denver during a typical June?" It should be obvious that we don't actually want to know how many shoes might be sold in June. That was easy to look up, and why would we ask someone in an interview for a transit agency a question like that?

We want an applicant first to recognize that it isn't about the answer, but how they might come up with an estimate. We have had applicants' answers ranging from "I could Google it", "There is probably a trade publication"; "I don't buy a lot of shoes" – all of which aren't very useful responses.

On the other hand, one applicant took us through breaking it down into relevant factors and building reasonable assumptions based on estimates. They walked us through their thought process, and even identified it as a Fermi-based question. (This last person now works on the team).

We can teach someone weak in one or two technical categories, provided they have the right attitude and other key attributes that seem to be good indicators of success in AM. It is harder or maybe even impossible to change a person's personality, or gain alignment with them on values – very much harder than training them in a skill.

To provide structure scoring and evaluation on applicant's answers, our interview panel members need guidance on how to recognize, score, and finally select applicants.

Written Interview

RTD AMD sends out written questions before the interview to all (likely) candidates. The main points these are testing for include:

- Attention to detail – do they answer questions
- Grit, from what they answer and also from finishing the written interview questions
- Self-awareness
 - Awareness of what they are good at
 - Awareness of what they want to do and what they don't want to do – and why; will also be a question of fit with the specific job
 - Awareness of other people's perspectives, e.g. previous managers; it also shows their ability to detach from situations
- How do they think: linear, structured
- Holding to an opinion even if not immediately popular, and why / in what circumstances: using evidence to form an opinion, and how this might change when better information is available

Our grading rubric is included in the appendices.

This is a good filter for who wants the job, as well as curiosity, sticking with it, going beyond compliance.

We send an explanation of the process.

- Essay questions are sent to the candidate with 5 business days to complete and return.
- Essay questions are graded before the applicant skills test and interview, if selected.
- Essay questions will be reviewed and scored by each interview panel member.
- Each question will be scored based on the observations made during independent review against the established grading rubrics. After individual review, then group review will take place
- Essay questions were selected based on the needs of the Asset Management Division.
- It is our expectation that all answers are complete and accurate and that you will respect the confidential nature of our process.
- Questions should be answered in enough detail to completely understand your thought process.
- Number and answer each question, and submit your completed answers in a single document using one of the following formats .DOC, GDOC, .DOCX or .PDF.

Here are a few samples of the written essay questions we have used in past recruitments.

Examples of Written Essay Questions

Please explain your understanding of the functions a (insert job title) is likely to perform.

This question allows us to tell if they actually understand what they are applying to do. It allows the candidate to really consider the functions and tasks they are likely to perform. Hopefully, this exercise helps create both buy-in and sets the tone for other questions. It also works well for us to understand how much effort was put into researching the position. Is this a grape-shot approach to applying for jobs, or are they targeting specific types of work?

What was a good decision you made recently that did not end in a positive result?

- How did you come to this determination
- What could have changed the outcome

'Resulting' describes the tendency to equate the quality of a decision with the quality of its outcome. But a good-quality decision can get a bad result. And vice versa. Asking this question helps identify 'victim mentality', but also identifies people who understand that decision frameworks coupled with uncertainty don't always result with the intended outcome. This also helps identify ownership and the recognition that knowledge, skill, effort, planning and options may improve future results.

What attributes do you have that you believe make you a good fit for this position?

First off, do they list skills or attributes? Did they take the time to think about the difference? Is it a canned response? Was there thought put into the link between their personal attributes and the work they said they expected to perform in other questions?

What is something you believe that almost no one agrees with you on?

Lou: this is based on a question used by Peter Thiel, and sometimes called the contrarian question. If you give me something that many people would actually agree with, then it's not a good answer. For example: "Our educational system is failing". Probably a few dozen out of 100 people might say the same.

There is a lot we look for in this answer, and we are guessing the good applicants will figure that out.

Ruth: after I saw this, it actually took me some months to come up with a good answer for myself: what do I believe that lots of people don't also believe?

Lou: unsurprisingly, some of the best answers I didn't agree with - but the applicant could clearly unpack their reasoning, and provided some evidence and structure that led them to this unpopular position.

Do you consider yourself more of a generalist or a specialist (select one)?

- How did you come to this determination?

First of all: do they commit? Do they provide a definition of the one they choose? If they look for weasel ways to say they are both, then they aren't paying attention.

Do they apply reason for considering themselves one connecting back to the job they are applying for, or have done in the past? Do they articulate how they came to that determination (are they self-aware)?

What attributes do you believe people need to be successful in most jobs?

Again, we are looking for attributes, not skills. This one allows us to look for general awareness as well as alignment between expectations of others and oneself. Do they have a list of beliefs that make people successful, and do they share those attributes? (For example, if they say 'integrity', do they show integrity themselves?) This isn't a trap. We are looking for the recognition that attributes are tied to success. (We don't want to see the top hits in google, either.)

What professional achievement are you most proud of?

- Why?
- How could you have done even better?

How do you use success of projects to improve future outcomes?

Which of these questions was the hardest to answer?

- Why?

We get funny answers or comments in response to these questions. Every interaction is useful for the candidate and for us.

We are not recommending you use these specific questions, nor that they will give you the best candidate for your particular needs – the real point is that you actively look for ways to identify people that will best fit your needs.

Testing

RTD AMD also makes use of tests at interview, for example, for both Business Analysts and Data Analyst roles, for the knowledge and skills to do the specific job. Each position test is aligned to the job, to rule out candidates that are not qualified, but not those that possess the essential skills and qualifications.

The first tests were written with a few ideas in mind. For example, we wanted people who would move forward when the answer wasn't clear, and so include questions that didn't have simple answers. We wanted to know they wouldn't quit when faced with pressure (we have had people get up and throw test at proctor, saying this is impossible). What was their strategy? So the first one or two questions are hard.

Other questions were looking for people who could think and solve problems. Some were designed as a 'chase your own adventure' with different areas, giving applicants the opportunity to show their strengths.

These were also far longer than could be completed in the given time. There is more than you can do – now what? This tells us a lot about the applicant.

Note that we look for feedback at every touchpoint with an applicant. Example: we have someone on the team administer the tests. The applicants do not know that this person works on the team.

Until her retirement, it was proctored by someone on our team who had spent 30 years of her career working in IT for a manufacturing company who specialized in aerospace components. This very unassuming person ran the test as if this was her normal job and, although it

was never implied, many people imagined she was part of the HR staff and not a part of the AM Data team.

A few years ago we had an applicant for a data team position come in for testing. They had scored high on their application and qualifications, but were apparently frustrated by the test. This person took out some of his frustration on our proctor. The interaction alone wasn't the decision point, but in a subsequent face to face interview, this aspect of his personality became clearer. Anyone who would take out frustrations on the good-natured person who was administering this test wouldn't fit into our culture.

Face to face interviews

Our in-person interview starts with a question that is some version of "Tell us about yourself, your education and background as it relates to this job". This question is a place where applicants can connect the dots from their resume to this job. For example, how their undergraduate degree in Biology allowed them to do research where they learned to apply regressions to data looking for correlations to test a hypothesis.

Here is an excerpt from our 'Guidance to interviewers' document:

We are trying to build an Asset Management focused organization that is productive, effective, efficient, with happy people. This is accomplished by hiring great people who have the knowledge, skills, and attributes necessary to succeed. Interviewing and evaluation are some of the most important responsibilities we have; your feedback on candidates will determine how the division and RTD evolves.

Key questions and intent for each one are listed in the interview guides.

Quality or Attribute	Understanding of Requirements			
Definition				
Intent	We are answering these questions: Do they understand the position they are applying for? Do they have the ability /aptitude to do the job (knowledge and skills to do the job)? Will they do the job (Do they have the motivation, attitude and drive to do the job?) Fit and balance Will they bring new and different ideas to the team and will they work well with the team?			
Question #1	Tell us about yourself, your education, and experience as it applies to this position.			
Observations				
Score	0	3	4	5

Example: Openness to Change

'Openness to change - Recognizes and embraces needed changes and is open to the changes. Clear support and positive descriptions or emotions expressed towards either change or the potential consequences of change. Expresses interest in helping others through times of change. Appetite to be involved or enact needed change. Shows an understanding of the need to be fluid in times of change using frameworks of flexibility to support efforts.'

We have interview questions that help us find curious people who like to learn, who actually look for problems to solve. Example: Tell us about a project you have embarked on just for fun where you had to learn a new skill? If you get a blank stare to this, it isn't a good sign.

One of the applicants, on the other hand, gets a gleam in his eye and pulls out his cell phone. He goes on to tell us about a Proportional-integral derivative (PID) controller system he built along with a custom-built meat smoker and how they work together. He showed us pictures on his phone, showed us the app that he developed to connect with his smoker and how it sends him a text message when the meat is at the desired temperature. From the app he can adjust the desired temperature by increasing air flow. He then went on to talk about using the data collected to build cooking profiles for different cuts of meats... You get the idea.



Another applicant told us about a greenhouse project where he was using Arduino's and a Raspberry pi as controllers to grow tomatoes year-round. He talked about making a how-to video and posting it on YouTube with links where you can download the code to build it yourself. Still others have described building modelling tools in excel to optimize their retirement portfolios. Someone talked about taking evening classes at a local culinary school.

Clearly these are not necessarily the specific skills we need in Asset Management, but there is something about people who see interesting and novel things and enjoy exploring new areas.

With both the written and in-person questions, the takeaway is that we need to craft a package of tools, test, and questions that can quickly and accurately identify good people for specific roles. The process should be tested, and produce consistent and repeatable results. To do all of this takes time and effort, but is the best investment a leader can make with their time.

Wage offers

With demand outstripping supply for good AM practitioners, offers should be swift for the best candidates, and strong based on the value they bring. This may seem obvious. However at RTD, and other public agencies in particular, we struggle to identify appropriate wages for these positions. And this is not helped if the process of making an offer is slower than it needs to be.

When we make an offer it should be our best and final offer. We should neither undercut, suggesting to people that we are trying to get them for the least possible, nor suggest they can fight for more. The least possible tells them how much we value them. And suggesting or accepting that candidates should negotiate is known to discriminate in favor of pushy men, and against women and minorities. Be straightforward!

Here's a specific example: what to offer an internal candidate. If we offer no pay increase to an existing employee we are using the fact we know what they are currently paid against them. They don't have a story for why they would take a lateral move to their parting manager, or their own families. It says that their new hiring manager doesn't value them more than their existing manager.

Review process

- Keeping track of functions and industries people apply from to help target in the future.
- Feedback from new hires on recruitment process
- Review before we initiate the next recruitment

On-boarding

On-boarding is critical to the success and integration of new people into the team. It is a key opportunity for us to build a relationship with a new employee, and important to retaining talented people. Stepping into a new job, environment and established team is intimidating.

And on-boarding doesn't start when the new hire shows up at work - it starts at the application.

We reach out to the successful applicant before their first day, with relevant information such as where to park, where to go, and anything they'll need to bring. Example of welcome email from manager to new team members:

Welcome to the best team at RTD!

I have attached a checklist that is meant to help you transition into your position here. Please don't be overwhelmed by it. It's really more of a list of things that you will need to become familiar with over the course of your first days.

I want to emphasize that the Asset Management Division is a work in progress. You were hired as someone who can help us improve our division and help RTD become better asset stewards. I look forward to working with you!

From there, IT equipment, desk, cube, orientation, email access, schedule, and any relevant systems and tools should ready to go before they walk through the door.

The on-boarding process doesn't end after day one. It is ongoing, and the new employee should be continually engaged, trained and incentivized to stick around. One way to help tackle this issue is to help new and existing employees develop their careers, set up accountability, assess capabilities and update responsibilities frequently.

On-boarding is the window during which we can make a positive impression with the new hire - one that will stay with them hopefully for the rest of their career. Problems in the first few days can leave a lasting bad experience. The impression that the company or team is not well managed can develop early, and some people might worry that it was a mistake to take the job. As the new hire meets more people in the organization and makes their way through their first weeks, those early preconceptions can stain the overall view of the company.

Remember: A-Players will only stay at a company that values them and where they believe they can do meaningful work. The expectation of excellence needs to be set early on.

RTD AMD procedures are still a work in progress. It has been discovered that, on the whole, most people blend in quickly, and any formal process naturally falls away. But this will not always be the same for external as for internal hires, because internal people already have considerable knowledge of internal processes.

The on-boarding process is more a repository and set of guiding principles with the intent of welcoming people to the team and helping push through any new job concerns. It gets the basic stuff out of the way so a new person is part of the team as fast as possible.

Below are general steps that AMD follows:

- The new employee is welcomed in an organized manner. All parties (reception, supervisor, co-workers) are prepared for the employee's arrival
- The employee should be shown to their new workstation and be left for a while to familiarize with their surroundings
- They are then introduced to colleagues, supervisors, and upper management when applicable
- Give them key documents to review (Employee Handbook, previous reports, etc.). The paperwork will be kept at a bare minimum at the start, so they are not overwhelmed
- Make use of concise presentations to brief on the mission, procedures, values and policies of the company and division
- Schedule meetings with them to answer any of their questions
- We should assist them to build a communication network (who to contact for what, who to report to). Organizational charts can be very useful, but they aren't everything
- Ease them into the new position by being assigning straightforward but meaningful work from the beginning. We will try to avoid urgent work, or duties not involved in the job description, to avoid any early demotivation
- Schedule them to shadow colleagues during their early work so they can get hands-on experience on how things are done.

Critical components of on-boarding

- **Culture** - Share the organization's values, mission, personality and overall culture. Talk about team culture and why our culture is important.
- **Identity** - Describe the identity of the people on the team and let them know that this is now part of their identity.
- **Clarification and expectations** - Responsibilities laid out from the beginning, with measurable results and a clear understanding of their role in the overall organization. Connection and alignment to moving people.
- **Connection** - Peer partners build relationships with current staff, their supervisors, mentors and other departments. New people are part of the team day one, so let them know.
- **Compliance** - New employees will need to know the rules and regulations. Make them clear, but don't dwell on them. Set a clear expectation that we all follow rules and that they are non-negotiable.
- **Why** - People who understand the why behind culture, clarification, connection and compliance are happier, more productive and make better teammates.

Staff turnover

RTD AMD has had and lost some key people over the last five years. If you are not losing people to promotion and retirement, you aren't hiring the right people. If you are building and developing talent in this space, you will lose some of them.

As AM team leader, the challenge is to protect the rest of the team by adding new people that complement the team, as well as ensuring we capture knowledge in daily practice. It is also the team leader's responsibility to understand why people are leaving.

You should know when your people are applying for outside and inside jobs, because they can discuss it with you. It should come up in monthly or weekly one to one meetings. And you should know what skills your people need to develop to be ready for their next job. We should be passing on responsibility and accountability for challenging projects to prepare people for the job they want next.

On the other hand, there are people that are happy where they are and don't want added responsibilities or to move up. Don't neglect those people: often they just have other things than career and status that make them happy and provide meaning.

Exit discovery

Here are a few of the questions AMD asks. There is a lot of trust necessary to get real answers – say thank you, and never justify or make excuses.

- Why did you begin looking for another job?
- What were the factors that ultimately led you to accept the new position?
- Was the experience, knowledge gained while here beneficial to you? How so, which ones?
- What have you secretly hoped we'd change as a team / agency?
- What should I change / keep the same?
- How can we best transition your responsibilities to other team members? How can we ensure success for your successor?
- Are there other leadership members you'd like to talk with?
- How did you feel as part of the team?
- How do you describe our culture as an agency / our team?
- Would you return to the team if a certain position opens in the future?
- Where, when, how do you want to celebrate your time with us?

SECTION 5

**Developing
the AM team:
some ideas
from RTD**

RTD AMD Environment

RTD AMD is lucky to have its own space, behind the overhaul maintenance shops (we found somewhere that wasn't being used for anything else and set it up as office space to the team's design). Working in close proximity fosters a feeling of team and belonging that may not happen in a more distributed model.

AMD's space includes a main, large meeting room, which has sprouted white boards to cover the walls and many dry erase pens, where new projects and ideas can be thoroughly discussed with the aid of diagrams and lists.

Each person has their own workspace, and there is a shared lunchroom with extra whiteboards that acts as backup meeting space.

Training and Development

From all current RTD AMD job descriptions:

Must have or be able to obtain certification in Asset Management from the Institute of Asset Management within one year of hire and obtain a Diploma in Asset Management within five years of obtaining the Certificate.

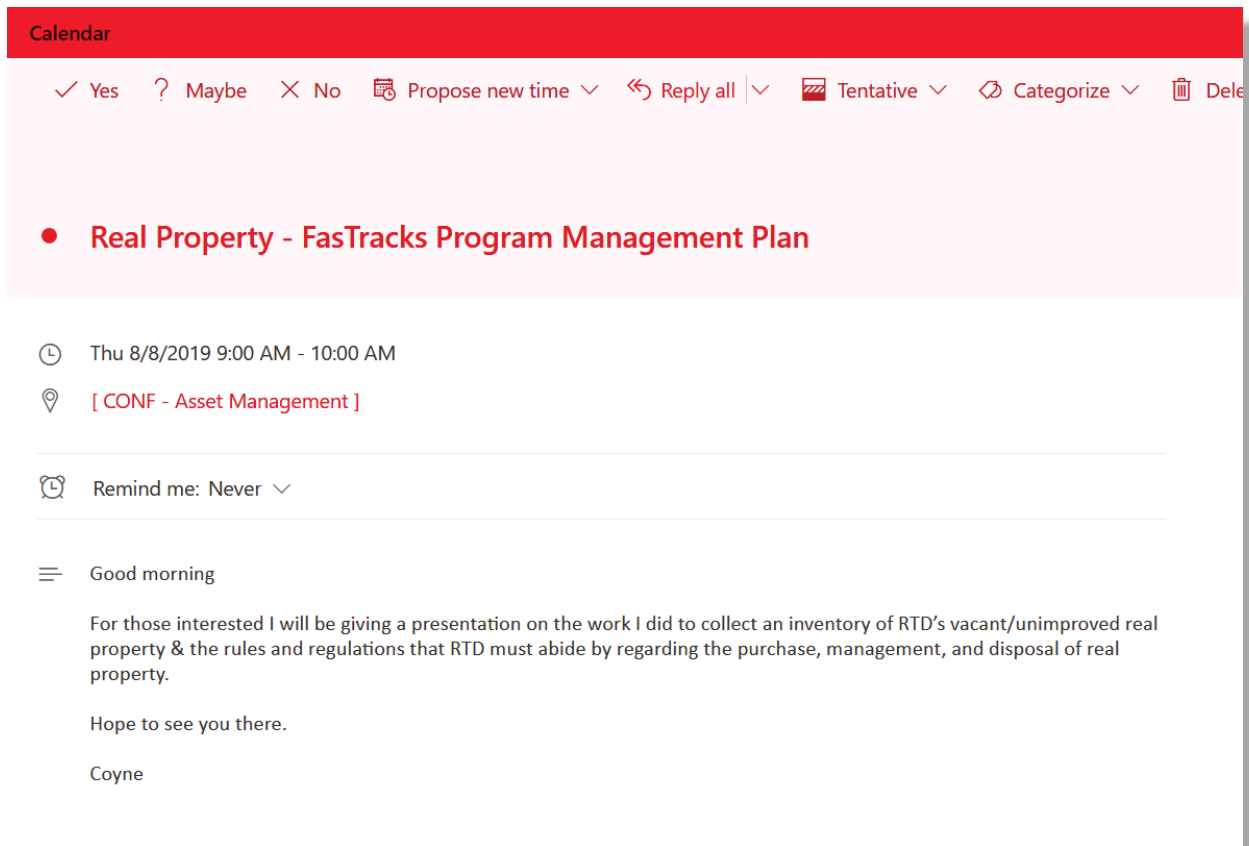
However, we believe it needs to go beyond this.

Having the appetite to learn is an essential trait in AM. Leadership may not be able to turn this appetite on, but it can turn it off at work by the wrong behaviour. To see change adopted within your team, you must first start exhibiting the mind-set and behaviours yourself.

In AMD we have both formalized and informal development plans for people on the team. Formal are plans that are agreed to on the annual evaluations and may include the ETD (education, training and development division). Informal plans are more organic and include learning any new skill or knowledge that could be useful now or in the future.

Knowledge and learning is valued, and support for education is the rule, not an exception. We have experimented with everything from flex project time, to working with our ETD to allow for more on the job training to be reimbursed. For a while, people could set aside 2 hours per week to work on ANY project or skill that would benefit the team now or in the future. We never really stopped the program, but as workload increased, finding time is hard.

AMD continues to be one of the highest users of Professional Development Plan (PDP) funds and continues to have high enrolment in leadership development programs. Each employee has a yearly allocated training budget and we help and encourage them to use it. If time is the barrier, plan and dictate time. It is worth it.



Within the group, people are encouraged to teach-out to the team on any subject that they are themselves working to expand knowledge. This is rewarded in several ways, including recognition from peers and adding to their quarterly evaluation score under communications.

The person is expected to build out a few bullet points for a lesson plan, build a presentation, worksheets, exercises or other activities that will add to the overall learning experience. These training sessions are then scheduled and people within AMD and others who may also be interested are invited to the conference room for a short class.

At the time of this draft one of the guys is offering a real property training teach-out later this week (see screenshot overleaf). These happen regularly and cover everything from data analysis tools and techniques to future drivers such as fleet electrification technologies.

We also have a person on the team who is a professor and teaches masters level courses in data analytics in the evening at one of the local universities. (He and we are very proud of this.) The value of teaching and learning extends beyond just the team.

We even threw a lunch celebration when one of the people who had left the team completed his Electrical Engineering degree which he had worked on the entire time he was in the AMD.

This also goes for when people strive for something difficult and miss it on first attempt. We encourage and help each other taking it as an opportunity to share what we know and to help others succeed. We celebrate the effort.

Failures are part of a learning culture, and if there aren't some missteps and mistakes then something

isn't right. The leader of the team has to not only give permission for their teams to fail, but also admit failures of their own, and demonstrate how the learnings from any failure have been used. We have had some really important learning experiences from mistakes; some are reviewed as a team and others one on one. It is always about the intent and looking what was expected compared with actually happened. When an error or mistake happens address it immediately, as soon as you are not in public.

Forms of knowledge sharing that might not be as obvious:

- Asking for feedback, advice, opinions, and even what someone would do differently
- Asking for help. Being able to do this goes along with the idea of feeling safe, and should be encouraged when needed.
- Asking what are we doing and why

An AM team leader needs to get comfortable with being surrounded by people who are better and more skilled than you are

Knowledge Management

Knowledge management is always a challenge, and perhaps nowhere as much as in a developing area such as Asset Management. We should be documenting our thought process and decisions, capturing why we did something or stopped doing something. This hasn't been a particular strength in RTD AMD to now, except in encouraging people to share what they know. But we were very lucky to be able to recruit someone with a Library Sciences background recently, so that we can start to address this properly.

Annual Employee Performance Appraisals

How do we empower our teams to do their best work? How do we consistently recognize those employees when they achieve their best, and give feedback when they don't? How do we do this as a public transportation agency where annual bonuses and huge salaries are not the norm?

In AMD, we aim to do this formally through the Annual Employee Performance Appraisals (AEPA). We have implemented a structured repeatable approach to the AEPA. This approach includes a set of standards, a simple process - and a "No Surprises" mantra.

The Employee Performance Standards (EPS) is the foundation to the entire AEPA process. The standards exist for Core Competencies and Job Specific Competencies for each position on the team. The standards are consistent across job types (Administrative, Professional, Supervisor, Manager, and Senior Manager) as well as being unique to the individual positions when necessary. With job and core competencies, we met as a group and determined what would qualify as: 'meets' expectations for each competency; 'exceeds' expectations for each competency. Those standards have been consistent year on year.

At the beginning of each quarter the employee sets goals for objectives. The goals include what meets expectations, and what exceeds expectations for each of the objectives. Their supervisor agrees the goals. At the end of each quarter, the supervisor meets with the employee to review if the objectives were achieved. and the employee receives a score accordingly. That score combined with the competency scores produce their evaluation for the quarter.

However, we do not just rely on quarterly reviews, but also weekly or monthly status updates so there are "No Surprises" on either side. We've chosen to break up the typical single annual appraisal into four separate pieces to make it more practical, manageable, and useful to both the employee and their manager.

The quarterly reviews are used as an opportunity to make the connection between the plan, the employee's actions, and the appraisal. The weekly or monthly status updates are used between quarterlies to provide employee support, guidance, and alignment across the division. The annual appraisal score is the summation of the quarterly scores and documentation, so each employee is aware of their annual appraisal score as they approach the end of the year. No surprises.

The recognition for the work an individual employee has achieved is an important cornerstone in the morale and identity of the Asset Management Division. The AEPA is the mechanism within the division to recognize our employees and their contributions in a consistent and equitable manner. We believe this approach provides substantial value to the employee, the division, the department, and ultimately the agency.

Generally speaking, the annual performance appraisals burden is meant to land on the individual employee. This includes documenting their accomplishments against the correct competencies and objectives within the correct quarter. This is intended to give the individual some autonomy - they are in charge of their own destiny, and the manager's role is to ensure the goals align with the department and the agency objectives.

Rarely, if ever, does someone stumble into a high score. The employee must develop a plan, communicate their intent, execute, adjust, and overcome obstacles to achieve a high score.

Luke Westlund, RTD AMD Manager, Business Analysis

Some thoughts on AM team culture from Lou

I am extremely fortunate to work with great people.

But a good team isn't just a collection of good people, although that is a huge part. To build the right team, we need to be clear on what the team would do, and what 'we' wouldn't do. How will we work together to achieve collective goals: team culture.

Early on this created a desire for me to ask where good culture comes from and how could it be built or sustained in a group. I believe these same strategies would also work to repair teams.

Regardless of what you might think about military organizations around the world, this is an area they excel at. They build teams and teams of teams. They create an identity and belonging that run deeper than family. I recommend that if you want to build a culture you read books by some of the great military leaders.

Essentially, we need to do this through a Plan-Do-Check-Act approach:

- Clarity about the enabling attitudes – a vision of the target culture, and a clear sense of what the culture is at the moment and how it falls short of what's needed
- Communicating and encouraging these in different ways to reach different groups
- Actively look for ways to measure and monitor this change
- Review and adjust change strategy from lessons learnt

If you have a team, or even a distributed network, you will need several key things.

Creating the right environment. Create a place where people can grow and achieve their potential. When we plant a garden plant choice isn't dictated only by the desire to have specific types or colors of flowers. It is important to think about soils, weather, sun, exposure, and even pests.

We discuss this as creating an environment where it is 'safe to explore': creating enough safety for people to be happy to go out in to the new, the unknown. There are some rules, and the leader will play a fair referee on them.

For example, when someone is in full flow, how can we show engagement with their ideas without interruption, through interjecting affirmations like "yes, ah, uh-huh, got it..."? (There is more on this in Asset Management and Intelligent Co-operation' paper from Ruth.)

An example of what doesn't work: we had a person who had come from a team where people were openly chastised for mistakes and called out in front of peers. I had reassured them that our meetings were safe and nothing was off limits. Then in a meeting one of our old team snapped out with a reaction to an idea he presented with "That is stupid, what were you thinking?" He reacted like a puppy that had been swatted by a newspaper.

I quickly pulled this person aside, but the damage was done. It took this person time before they felt safe, and they continued to preface comments with things like "if it is okay, I have a question about that."

I have since made it much clearer that we thank people who venture out onto a limb with ideas and we NEVER act this way to people we care about.

When we acknowledge that we can be hurt (personally, professionally, emotionally) but know that these people I work with won't let that happen, that we feel like we can push into new spaces and throw out untested ideas.

It is the leader's job to show and signal that putting yourself out there into vulnerable space is a strength and not a weakness. I believe among the most important messages a leader can convey are things like "That wasn't the best call", and any other ownership of problems.

Communicate that you are listening and that we are a team of listeners and observers. Sitting in our meetings I notice body language and words used. Heads are tilted, nodding either yes, or no. Posture is always open and not puffed up / confrontational or disengaged / disinterested. There are pauses between thoughts, including sometimes seconds of silence, as well as spirited interruptions. There are times to listen, and times to challenge, and it's good to appreciate the distinction.

There is a method of steel-manning someone's position before taking a counter position.

In a recent meeting after I put an idea out, one of the guys on the team got up and walked up to the white board and built a quick matrix. He explained what I was saying and then stopped. He looked to me for confirmation that he captured my thoughts, then asked me to expand on the idea. He basically helped me walk through the idea in full detail.

After we were done then he showed his idea on the same matrix in a different color. Then, he asked for my thoughts. Since I knew he listened and understood my idea, it was easy to see that I didn't need to explain more - and that he had a better plan.

Love the messenger. This is a common problem everywhere. If we don't like the message, our response is to react. Instead, encourage everyone to try and start every reply to bad news or a message you didn't want to hear with 'Thank you'. Tell the person you appreciate them and thank them for delivering a difficult message. In extreme instances, ask them give you a few minutes to think. Questions even from a place of curiosity can be taken the wrong way by the messenger.

I am so grateful that I work with people who will tell you truths even when you don't want to hear them. In this environment you know when someone tells you something is good, it actually is.

The pre-mortem. Prior to actions, or important meetings, we go over what could go wrong, what questions are likely to be asked and how we plan to answer them. We check our numbers and our assumptions. We ask hard questions such as: what if none of our assumptions or answers are true? We intentionally try and poke holes in presentations, reports, plans and anything else that might go outside our team.

After action reviews aren't about credit or blame. We try and do this shortly after important meetings, tasks, audits and other team activities. We ask questions like what did we see / what was said, what questions were asked / were we prepared. The goal is to build shared lessons that can be applied to the future. We share experiences, mistakes, lessons learnt and what we would do differently. We do this after successful and not successful things. What is important is that we leave ego at the door and use humility and curiosity to come out better each time.

Watch out for ego with credit. If someone has the seed of a great idea but it can't work without some other part from another person, it is a team-owned outcome, and needs to be recognized as that.

On our team there is one person who is particularly generous about helping others and giving all the credit to them. He is someone who will lean back in his chair while someone else makes excited whiteboard ideas. Then this person will add some gem that makes all the parts neatly snap into place. Later, when recounting the exercise, he will defer all credit to either other individuals or the team. This person has changed the dynamics on our team in a very positive way with his giver mind-set.

Messaging belonging. "Every person on the AMD team belongs and makes us better than the sum of our parts."

There are countless team building activities that might work, but also seem forced. Build towers out of spaghetti and marshmallows, or come up with 100's of uses for paperclips...

Instead, we have meetings where we talk about what we are working on and what is important in our lives, sometimes formal meetings and others are over donuts or breakfast burritos. All are valuable and build relationships.

And Dunder Mifflin awards, as on the TV show The Office. Once a team is working well, and is fundamentally very serious about what we are creating together, we can afford to have some fun and laugh at ourselves too.

- Solves problems we didn't know we had in a way we don't understand
- Herding Cats Award - for her work on the IT asset inventory
- Precision Award - Dwight Schrute Logic, "Home is where the heart is... false, it's in the chest cavity"
- Moustache in a State of Good Repair Condition score >5
- Compulsive Organizer Award - alphabet soup needs to be alphabetized prior to eating
- Engineering is the hammer that will either cause or fix the problem you have
- Most likely to star in the Hollywood feature on AM

What to do when individuals are hurting the team? Simple, the leader is responsible sorting this out. Do it as soon as possible, or you aren't protecting the team.

Some challenges in managing an AM team

Smart people

- Can have big personalities
- Ask hard questions
- Challenge you when you are being stupid or wrong, often not diplomatically
- Can be so intelligent that they know they are not the expert in a domain and will defer to other less right 'self-proclaimed experts'
- Tend to deliver either in bursts or slow drips – they are not all the same. You need to recognize how they work.
- Are not always confident in their abilities
- Are sometimes less comfortable outside of their domain of knowledge
- Are not always long-suffering, especially of people in higher positions who know less than they do
- Can turn cynical if decisions do not make sense to them or their ideas are not taken seriously
- May currently identify as a technical expert, which can come with its own issues

Asset Management is not the only area in our society that can have challenges with experts. We don't mean that we need less expertise, or should not listen to people who know more than we do. But an increasing amount of research suggests that people who identify as experts come with their own blind spots; and that being smart and well educated, and knowing it, can make for worse, not better decisions.

The real issue is assuming you know more than you do – lacking humility about what you don't know, and believing that what you know is enough. 'To the man with a hammer, every problem is a nail.' In the world of asset decisions, no one person ever knows enough.





CONCLUDING THOUGHTS

If you can make things better, do so.

To be good at something that requires skills and knowledge, you need people with those skills and knowledge. We wouldn't try to design assets without engineers, or get everyone to do their own IT.

Our hypothesis is that a small dedicated team is the best way to do Asset Management, and this requires people who have been trained in this domain of knowledge. We should follow industry standards, and build a framework that best suits the needs of our organization.

RTD AMD often gets told, 'you are lucky to have a team'. And getting – and seizing - the right opportunities at the right time does of course come into it. However, waiting for luck isn't how we should approach Asset Management. So AM requires a team: what can we do to build it? Where can we start, with what we have?

This is our first attempt to help by sharing our experiences. The next version will be better, with your feedback and experiences.

Asset Management, when it comes to it, has to be more about guts than luck.

We need to seek to recruit people better than we are, not just "people like us". Ideally "so good they scare me". That may not be good for the ego – but then ego isn't so good for Asset Management, either.

Do the work, the assets are counting on us. We are the stewards for the infrastructure of the future, and with this comes great responsibility.

People like us care about things

Takeaways

1. Successful Asset Management first requires that you have people who know what it is and how to do it
2. You then need people – some dedicated resources - to actually do it
3. This requires some specific and complementary skills, knowledge and attributes
4. The work and resources to build an effective team will be repaid many times
5. The AM team needs to keep learning and evolving – with the flexibility to stop doing things that don't work
6. And there is still more to be worked out, including effective risk management, integrated management systems, the role of good AM team in business strategy (and Penny's Third Revolution).

Many thanks to

This makes use of the commitment and experience of many people, including:

RTD leadership and the AMD team, especially GM/CEO David Genova, CSO Mike Meader, AMD managers Chuck Austin, Luke Westlund, and Dennis Yaklich

AMCL, in particular Richard Edwards

Special thanks to Matt Miles for his graphic design, amazing as always

Chris Lloyd and Dr Charles Johnson for pioneering how to approach Asset Management culture

John Lavan

Experiences with other NA AM teams including Chelan County PUD, Tacoma Power, Manitoba Hydro, PG&E, Sound Transit, BART, City of Brampton, and further back with London Underground, Scottish Water, NSW RailCorp, Yorkshire Water, SFK Technology and Sarras

Red Team / Beta testers: Richard Edwards; Penny Burns; Russ Seiler, Grant County PUD; Dave Cooke, Krista Halayko and Jesse Perry, Manitoba Hydro; Janel Ulrich, Chelan County PUD; Todd Shepherd, Julie DeYoung, Tacoma Power; Gayle Gartner, Thomas Humphrey, Metro Transit Minneapolis; Ark Wingrove, Kompas (the Wandering/ Wondering Asset Manager); Tina Ignat, Metra; Kristyl Horton, BART; Daniel Hofer, Utah Transit Authority.

People who particularly egged Lou on include Mshadoni Smith of FTA TAM and Kristyl Horton of BART.

This publication was produced with the generous support of Dave Genova and the directors of AMCL.

Material we found useful

Dr Penny Burns

Strategic Asset Management newsletter and Talking Infrastructure website

www.talkinginfrastructure.com

('Generating Better Questions')

Dr Charles Johnson and Chris Lloyd

Charles Johnson and Chris Lloyd (2012) '*Organisational Culture and Leadership – Lessons for Asset Management*', IET Asset Management Conference November 2012

Charles Johnson (2010) 'Creating An Asset Management Culture', in Chris Lloyd, *Asset Management: Whole-life management of physical assets*, Thomas Telford London

Charles Johnson and Chris Lloyd (2014) 'The Seven Revelations', *Assets* May 2014 Issue

Ark Wingrove

www.thewanderingassetmanager.com ('Because no-one anywhere has all the answers')

IAM Resources

www.theiam.org

FTA TAM Website

www.transit.dot.gov/TAM/

www.transit.dot.gov/research-innovation/transit-asset-management-guide-2016-report-0098

Moving Ahead for Progress in the 21st Century Act, Pub. L. No. 112-141, 126 Stat. 405 (2012).

ISO 55000 Series

British Standards Institute, *BSI PAS-55*.

Books: too many to mention, or even remember, but certainly:

Douglas Hubbard, *How to Measure Anything* and *The Failure of Risk Management*

Geoff Smart and Randy Street, *Who*

Jacko Willink and Leif Babin, *Extreme Ownership*

Ruth's paper on '*Asset Management and Intelligent Co-operation*' is available from ruth.wallsgrove@amcl.com



The background of the page is a solid yellow color. Overlaid on this are several thick, white, wavy lines that meander across the page in various directions, creating an abstract, organic pattern. The lines vary in thickness and form, some resembling long, sweeping curves while others are more intricate and looped.

APPENDICES

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MAP-21

MAP-21, the Moving Ahead for Progress in the 21st Century Act (P.L. 112-141), was signed into law by President Obama on July 6, 2012. Funding surface transportation programs at over \$105 billion for fiscal years (FY) 2013 and 2014, MAP-21 is the first long-term highway authorization enacted since 2005.

MAP-21 is a milestone for the U.S. economy and the Nation's surface transportation program. By transforming the policy and programmatic framework for investments to guide the system's growth and development, MAP-21 creates a streamlined and performance-based surface transportation program and builds on many of the highway, transit, bike, and pedestrian programs and policies established in 1991.

Extensions of MAP-21

To allow more time for development and consideration of a long-term reauthorization of surface transportation programs, Congress enacts short term extensions of the expiring law, in this case, MAP-21. Information about MAP-21 extensions may be found on the Legislation and Funding Tables pages of this site.

<https://www.fhwa.dot.gov/map21/>

TAM Final Rule

DEPARTMENT OF TRANSPORTATION Federal Transit Administration

49 CFR Parts 625 and 630 [Docket No. FTA-2014-0020] RIN 2132-AB07

Transit Asset Management; National Transit Database AGENCY: Federal Transit Administration (FTA), Department of Transportation (DOT). ACTION: Final rule.

SUMMARY: The Federal Transit Administration is publishing a final rule to define the term state of good repair and to establish minimum Federal requirements for transit asset management that will apply to all recipients and subrecipients of chapter 53 funds that own, operate, or manage public transportation capital assets. This final rule requires public transportation providers to develop and implement out transit asset management (TAM) plans. TAM plans must include an asset inventory, condition assessments of inventoried assets, and a prioritized list of investments to improve the state of good repair of their capital assets. This final rule also establishes state good repair standards and four state of good repair (SGR) performance measures. Transit providers are required to set performance targets for their capital assets based on the SGR measures and report their targets, as well as information related to the condition of their capital assets, to the National Transit Database. DATES: Effective October 1, 2016.

FOR FURTHER INFORMATION CONTACT: For program matters, Mshadoni Smith, Office of Budget and Policy, (202) 366-4050 or Mshadoni.Smith@dot.gov. For legal matters, Candace Key, Office of Chief Counsel, (202) 366-4011 or Candace.Key@dot.gov.

<https://www.govinfo.gov/content/pkg/FR-2016-07-26/pdf/2016-16883.pdf>

ISO 55000: Managing Assets in the context of Asset Management

This document addresses a simple question: Do you mean Asset Management or Managing Assets? People and organizations have been caring for assets since mankind first invented tools. Over the years we have derived entire disciplines to help define the best ways to care for those assets through their lives and as such we have been Managing Assets for ever. With the advent of the formal discipline of Asset Management some 20 years ago there has been a development of structured approaches to assure stakeholders that those care activities are focused on deriving value for the organization and not just promoting 'gold-plated' care arrangements. In this pursuit Asset Management and Managing Assets are not alternatives.

Managing Assets (things you do to assets) can be done with or without a structured organizational strategy and context. An organization gains more value from Managing Assets within a context of organizational purpose and strategy that steers this activity (and becomes Asset Management).

Asset Management has a broader focus than Managing Assets, encompassing many organizational levels and applying to all functions or departments. The terms and concepts are explained in ISO 55000 'Asset Management', which shows how the application of broader Asset Management approaches can help you extract most value for stakeholders.

With the broad acceptance of Asset Management as a discipline there are many cases of other activities being rebranded as Asset Management and it is important the value that Asset Management brings from a broader organizational view is not lost.

Here are several questions that indicate whether the primary focus of a given conversation or activity is Asset Management or Managing Assets....

<https://committee.iso.org/files/live/sites/tc251/files/stories/ISO%20TC251%20WG4%20MACAM%20May%202017%20EN.pdf>

WMATA Job Description for Director, Asset Management

The Washington Metropolitan Area Transportation Authority (WMATA) is seeking to hire a dynamic leader for the position of Director of Transit Asset Management. This position is within the Office of Capital Planning and Program Management.

The successful candidate will be responsible for leading WMATA's Asset Management Program, is involved in developing strategic asset management programs and change management policy, framework, implementation programs for the Authorities' asset management plan, communicating to all stakeholders and providing the necessary accountability. In addition to developing WMATA's asset management plan, duties will consist of leading its implementation, developing full lifecycle management activities, to include capital programming.

An ideal candidate will also have broad transit industry exposure, transit asset knowledge, maintenance planning, capital and financial planning and/or engineering expertise. This position will manage across transit agency departments, lead change management initiatives and improve communications with both internal and external clients and senior management.

Requirements:

- Bachelor's degree in Transportation Management, Business Administration or a related field;
- Minimum of ten (10) years of progressively responsible and diversified management experience within the transportation industry – public transportation preferred;
- Demonstrated ability and experience in the completion of major transit asset management related efforts within budget and on schedule;
- Demonstrated experience in the development and implementation of major policies and projects within Engineering, Operations or Asset Management;
- Strong technical proficiency required, including Microsoft Office products;
- Excellent written and verbal communication skills in a dynamic environment;
- Ability to work independently as well as in a collaborative team environment; offer constructive feedback and direction to support goals; and
- Quickly adapt and respond to industry changes as well as internal initiatives

CODE NO: 5144

**WASHINGTON METROPOLITAN AREATRANSIT AUTHORITY
POSITION DESCRIPTION**

**DIRECTOR, ASSET MANAGEMENT, BC-16
DEPT/OFFICE: TIES**

DATE: 12/5/13

FLSA: EXEMPT
ROLE: 05

REVIEWED:

AGM-TIES:

DGMO:

HRCB:

LABR:


AIZ
12/5/13
SD NR 10-17-13

REPORTS TO: AGM, Transit Infrastructure and Engineering Services

SUMMARY:

This position is responsible for leading Washington Metropolitan Area Transit Authority's Asset Management Program, including the development of Metro's asset management plan, communicating to all stakeholders and providing the necessary accountability. Incumbent coordinates all enterprise-level asset management activities and ensures all asset-level activities are supportive of the overall asset management strategy. Incumbent defines and coordinates the development of appropriate asset data to support asset management business processes. This position will manage across transit agency departmental silos, lead the change management initiative, and improve communications both within and between departments. This position is responsible for developing the asset management plan, leading its implementation, developing lifecycle management plans, compiling and communicating best practices, and supporting all enterprise-level asset management activities, including capital programming and operations and maintenance budgeting.

MAJOR DUTIES:

Holds responsibility for the development and maintenance of Metro's Asset Management Policy, Asset Management Strategy and Annual Asset Management Plan in relationship to Board strategic goals.

Develops strategies, plans, and requirements for information management and coordinates information management across the business using Metro's enterprise technology systems.

Oversees the development and ongoing maintenance of the Transit Asset Inventory and the implementation of full asset life cycle costing.

CODE NO: 5144

Coordinates the development of Metro's Asset Management Group Strategies and Plans, including objectives and performance targets.

Supports Metro departments in the development of their bi-annual Business Plans. Develops and reports required information based on FTA's Transit Economic Requirements Model (TERM-Lite) and the National Transit Database (NTD) asset inventory module (AIM).

Assures compliance with the FTA's MAP-21 legislation.

Ensures periodic asset condition assessments are performed and Metro's assets are brought to and maintained in a state of good repair.

Monitors and forecasts asset acquisition, renewal, rehabilitation and replacement. Defines requirements and evaluates the business case for maintenance and renewal projects.

Coordinates the gathering and prioritizing of asset management investment requirements for Metro's Capital Needs Inventory (CNI) and assists in obtaining funding for asset management projects.

Supports Metro's asset owners in the analysis and evaluation of asset maintenance and replacement decisions throughout the full asset life cycle.

Establishes guidelines and assists Metro asset owners with commissioning assets into service and decommissioning and disposing of assets that have reached their end of their life.

Improves and enhances Metro's organizational competence in Asset Management. Coordinates the assessment and assists in mitigating asset related risk.

Leads the Asset Stakeholder Reference Group meetings to ensure cooperation and liaising between the different departments and business functions.

Communicates asset management activities, accomplishments, challenges, and potential risks to relevant stakeholders.

Holds responsibility for developing and sharing asset management best practices throughout the organization.

The above duties and responsibilities are not intended to limit specific duties and responsibilities of any particular position. It is not intended to limit in any way the right of supervisors to assign, direct and control the work of employees under their supervision.

RTD AMD Job Description: Business Analyst, Physical Assets

Job Title:	BUSINESS ANALYST, PHYSICAL ASSETS	Established:	March 2018
Status:	Exempt	Revised:	
Pay Grade/Code:	EXF	Department:	Safety, Security and Asset Management



Description of Work:
This position provides support and assistance to asset owners for the collection, compilation and analysis of data in order to make sound business decisions minimizing the life-cycle cost of assets, maximizing value and managing risk. Responsible for the FTA required State of Good Repair asset condition assessments.

Duties & Responsibilities:
ESSENTIAL:
Develops and embeds asset management good practice in the organization in order to continuously improve the asset management capability.
Interacts with asset owners, maintenance technicians, and contractors to collect maintenance, performance, and asset condition data.
Develops assessment criteria for verifying the condition of assets; monitors maintenance procedures; establishes criteria for component change out intervals.
Authors, analyzes and interprets asset level condition, performance reports and resource needs projections.
Conducts asset condition assessments.

Qualifications:

Bachelor's degree in finance, business, analytics, business intelligence or a related field.

A minimum of three years of experience analyzing and evaluating business processes and data preferably in the area of physical asset management. Proficiency in working with the principles of physical asset management; asset cost, risk and performance, and asset decay modeling preferred.

A minimum of three years of experience in data mining.

A minimum of three years of experience with Enterprise Asset Management (EAM) systems or Maintenance Reporting Systems (MRS)

Must have or be able to obtain certification in Asset Management from the Institute of Asset Management within two years of hire date and obtain a Diploma in Asset Management within 5 years of obtaining the certificate.

Ability to translate mathematical information into concise reports.

Proficient with Microsoft Office Suite, advanced Excel skills.

Ability to communicate effectively, orally and in writing.

Ability to use sound judgment.

Ability to manage time and workload effectively, which includes planning, organizing, and prioritizing with attention to details.

Ability to work non-standard working days and hours, as needed.

OR

An equivalent combination of education, experience, knowledge, skills, abilities.

RTD AMD Job Description: Manager, Business Analysis

Job Title:	MANAGER, BUSINESS ANALYSIS	Established:	March 2018
Status:	Exempt	Revised:	March 2018
Pay Grade/ Code:	EXH	Department:	Safety, Security and Asset Management



Description of Work:
This position is responsible for assisting asset owners in developing asset management policy, strategy and objectives in alignment with the organization's objectives and requirements, and communicating and embedding these into the organization structure. Coordinates the development, review, and implementation of asset management plans that take a lifecycle cost view.

Duties & Responsibilities:
<p>ESSENTIAL:</p> <p>Recruits staff to include interviewing, hiring, assigning work, training, coaching, and counseling to ensure consistent application of Employee Guidelines, processes, and procedures. Conducts performance review, and holds employees accountable for performance of their responsibilities.</p> <p>Contributes to the formation of strategy in relation to the management of physical assets, and transformation of the agency.</p> <p>Undertakes analysis to understand agency risk, performance and cost profile, and supports change processes.</p> <p>Prepares, reviews, and recommends updates to procedures or training for the physical condition inspection of assets.</p> <p>Determines inspection criteria to verify the condition of assets, monitors maintenance practices and procedures, and assists in establishing component change out mileage or time interval.</p> <p>Plans and coordinates State of Good Repair inspections or equivalent sampling on RTD and private contractor assets.</p>

Qualifications:

Bachelor's degree in Finance, Business Analytics, Business Intelligence, or related field

A minimum of five years of experience analyzing and evaluating business processes and data, preferably in the area of physical asset management

A minimum of five years of experience in data mining

A minimum of three years of experience with Enterprise Asset Management (EAM) or Maintenance Reporting Systems (MRS)

A minimum of three years of experience in a supervisory role.

Proficiency in the principles of physical asset management, asset cost, risk and performance and asset decay modeling preferred.

Must have or be able to obtain certification in Asset Management from the Institute of Asset Management within one year of hire and obtain a Diploma in Asset Management within five years of obtaining the certificate.

Proficient with Microsoft Office Suite.

Ability to communicate effectively, orally and in writing.

Ability to use sound judgment.

Ability to manage time and workload effectively, which includes planning, organizing, and prioritizing with attention to details.

Qualifications:

OR:

An equivalent combination of education, experience, knowledge, skills, abilities.

CORE COMPETENCIES: MANAGER

SAFETY: Promotes safety as agency's number 1 priority in decision-making, reporting, learning, mitigation and follow-up. Zero tolerance for unsafe conditions or acts. Promotes continuous improvement of safety culture.

COMMUNICATION: building and maintaining relationships, mentoring, presentation capabilities

MANAGING/PROBLEM SOLVING: supports and manages change efforts, innovative approaches in problem solving, plans direction for work group to tie in with organizational goals, takes responsibility for outcomes, models desired behavior

STAFF DIRECTION: timely and thorough planning for tasks and projects, equitable distribution of assignments, utilizes staff strengths, develops staff in weak areas, constructively addresses staff performance problems

PERFORMANCE MANAGEMENT: provides feedback on performance throughout the year, initiates performance plans and disciplinary actions at appropriate times, plans ahead to prepare and present appraisal to salaried employees in a timely manner, and consistently follows the CBA in performance management of represented employees if applicable.

ETHICS AND INTEGRITY: perceived fairness; tolerance; honesty; consistent in application of policies and procedures.

DIVERSITY ORIENTATION: encourages and supports diversity of employees and contractors (Disadvantaged Business Enterprise); participates in Equal Employment Opportunity/Affirmative Action events and training; refers EEO/AA concerns in a timely manner.

JOB SPECIFIC COMPETENCIES:

SPECIALIZED KNOWLEDGE: specialty field of knowledge is up to date and properly applied

ANALYSIS: evaluates different alternatives and selects or recommends the one that best meets the business and professional need of the situation without regard for personal biases

COACHING: supplies articulate instructions and/or recommendations to ensure requirements

Qualifications:

JOB SPECIFIC COMPETENCIES:

SPECIALIZED KNOWLEDGE: specialty field of knowledge is up to date and properly applied

ANALYSIS: evaluates different alternatives and selects or recommends the one that best meets the business and professional need of the situation without regard for personal biases

COACHING: supplies articulate instructions and/or recommendations to ensure requirements are clearly understood; provides constructive feedback, positive reinforcement and recognition; addresses performance shortfalls constructively.

RTD AMD Job Description: Manager, Data Sciences & Analytics

Job Title:	MANAGER, DATA SCIENCES & ANALYTICS	Established:	March 2018
Status:	Exempt	Revised:	March 2018
Pay Grade/Code:	EXJ	Department:	Safety, Security and Asset Management

Reports To:	Senior Manager, Asset Management
Supervises:	Asset Management Administrator / Report Developer & Assistant System Administrator, Senior BI Developer/Architect, Safety & Security Analyst

Description Of Work:

This position applies data sciences methodologies, mathematical modeling and other optimizing methods to develop and interpret information that assists with decision making; policy formulation; and other functions related to Asset Management. Responsible for overseeing mission critical data warehouses and insures confidence in data quality.

Duties & Responsibilities:

ESSENTIAL:

Recruits subordinate staff to include interviewing, hiring, assigning work, training, coaching, and counseling to ensure consistent application of Employee Guidelines, processes, and procedures. Conducts performance review, and holds employees accountable for performance of their positions.

Analyzes information and evaluates results using logic and reasoning to identify the strengths and weaknesses of alternative solutions.

Gathers and interprets rich data sets solving challenging questions and communicates insights/findings to stakeholders.

Develops, designs, or creates new applications, ideas, relationships, systems, or products.

Estimates the quantifiable characteristics of events, or information and creates sampling plans. Develops instruments to estimate sizes, distances, and quantities; for determining time, costs, resources, or materials required.

Identifies measures or indicators of system performance and the actions needed to improve or correct performance.

Qualifications:

Bachelor's degree in Business Administration, Decision Science, Mathematics, Analytics, Engineering or a similar discipline. Master's degree preferred.

A minimum of three years of experience in statistical analysis or data analysis- the ability to compile, code, categorize, calculate, tabulate, audit, and verify information and/or data.

Proficiency in research and data analysis with close attention to detail and problem solving skills.

A minimum of five years of experience with software such as Oracle ERP modules, OBIEE, IBM SPSS, Minitab, SAS, JMP, Genstat, STATISTICA, BMDP, LIMDEP, LISREL, NCSS, Sigm-Stat, Stata, Statgraphics, StatsDirect, R Project or Unistat.

A minimum of two years of experience in a supervisory position.

Ability to interpret the meaning of information for others — translating or explaining what information means and how it can be used.

Proficiency in economic and accounting principles and practices, analysis and reporting of financial data.

Proficiency in business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods, and coordination of people and resources.

Ability to manage time and workload effectively which includes planning, organizing, and prioritizing with attention to details.

JOB SPECIFIC COMPETENCIES:

CONCEPTUAL THINKING: applies common sense, theory and experience to decision-making; interprets data for discrepancies and trends, and recognizes subtle patterns; identifies key issues or uses inductive reasoning in complex situations.

INNOVATIVE: generates and explores different, creative, imaginative or unique approaches; challenges conventional practices; thinks outside the box

SPECIALIZED KNOWLEDGE: specialty field of knowledge is up to date and properly applied

The Data Web

Data at RTD evolved organically, the agency did not have a unified strategic plan for how to manage data, it started collecting data and meeting specific needs one-by-one. When the agency needed to solve different problems, such as relating the depreciable cost of projects to the specific addressable assets, it was discovered that the individual strands connecting information nodes didn't construct a web. For example, the cost of a specific crossover in a section of track couldn't be discerned from what it cost to construct a mile of track. The cost of the entire mile of track was perfectly acceptable for Capital Programs to verify the project was completed, and effective in determining the depreciation on the assets for accounting purposes, but we were left wanting when trying to determine original costs, costs expected over the life of the track, and what costs may be when due for renewal.

The Map and the Territory

Data is an analogue of what exists in the world, it is only useful if it is so. Data is often more useful when it includes only that which is useful to the matter at hand.

Information is derived from data. Data can be mere noise until it is information. Information is what we take in to influence our decisions.

Data and information are used in navigation. Is the best map always the highest resolution photo? Likely, no. It isn't to say that a high resolution photo is never useful, but it isn't often the granularity of information that is needed. It is much more useful to present a sufficiently accurate representation of a road when navigating via rubber tired vehicles.

People often have extreme views of data. Often, there's an initial overconfidence. We intuit that we have sufficient understanding to make correct decisions. When we discover that the result is not as expected, there's a reflexive desire to acquire all possible information on a subject. This leap from a lack of critical information to a desire for an overwhelming glut of data ignore the useful range that lies between these two extremes.

We may want to know the "real-time" location of a bus, but we may know more about the bus than its location. We may know a lot of information about a bus, like the number of seats, the square footage of the interior, the operator's employee ID number, the gallons of fuel in the tank, and the miles since the last service. None of that is relevant. We need to filter signal from noise to make this useful. In reality, we don't know the "real time" location of a bus at all. The bus will announce its location in X-Y coordinates on a predetermined cadence. It isn't broadcasting an uninterrupted series of GPS information, and that's fine. Even an interval of 30 seconds is sufficient to know what we need to know about a vehicle's position for nearly any decision we're likely to make.

Dennis Yaklich, Data Science Manager, RTD AMD

Asset Management Accountability Team (AMAT) Charter



Regional Transportation District

safely connecting
your city

September 8, 2018

Asset Management Accountability Team Charter

ESTABLISHMENT AND AUTHORITY

The Asset Management Accountability Team is a four-member team established September 1, 2018 by Dave Genova, GM/CEO.

PURPOSE

The purpose of the Asset Management Accountability Team (AMAT) is to assume organizational accountability for the design, delivery and continuing maturity of an Asset Management System for RTD. Such accountability is formally delegated to the AMAT from RTD's accountable executive, the GM/CEO.

This includes delivery of:

- An ISO 55000 compliant Bus, LRV, Rail Infrastructure, Facilities, and ITS maintenance system that aligns directly with the agency purpose and objectives (RTD, 2018).
- An Investment Prioritization Process that aligns directly with the agency purpose and objectives (RTD, 2018).
- An ISO 55000 compliant Asset Management System that aligns directly with the agency purpose and objectives (RTD, 2018) and meets all requirements of MAP-21 (Department of Transportation, 2013).
- Embedding the Asset Management System procedures into business as usual and ensuring the AMS remains fit for purpose.

CHARTER

The Asset Management Accountability Team will:

- Provide guidance on the continuing maturity of asset management at RTD, including the allocation and availability of sufficient and competent resources;
- Review and endorse the asset management policy, asset management strategies, asset management plans, and governance frameworks;
- Monitor the application, effectiveness and efficiency of the approved asset management policy, asset management strategies, and asset management plans to deliver the required agency objectives, asset outcomes (e.g. cost, performance, risk), and the safe operation of the network over the complete asset lifecycle;



- Provide overall coordination and monitoring of the Asset Management System and the Safety Management System to enable them to remain suitable, adequate, and effective to meet ongoing business needs, agency objectives, and the safe operation of the network.
- Provide guidance on the continuing maturity and implementation of the Asset Management System and the Safety Management System;
- Consider the performance of the Asset Management System and the Safety Management System taking into account factors such as:
 - Audit results.
 - Trends in KPIs.
 - Trends in incidents and corrective actions.
 - Changes in the profile of risks to the network.
 - Internal and external changes that will have a significant impact on the asset management system. Changes in stakeholder requirements;
- Assist in communication activities to raise the awareness of asset management, the Asset Management System, and the Safety Management System; and
- Consider reports, recommendations and/or issues submitted by the various asset managers and safety committees.

TEAM COMPOSITION AND GOVERNANCE

1. Membership

The team shall be composed of the Chief Operating Officer, the Chief Financial Officer, the Chief Safety Officer, and the Assistant General Manager Capital Programs.

Team members represent business functions. If the organization is restructured at the executive level, this team membership will change such that the following functions are always represented at the executive level:

- Bus vehicle design, acquisition, maintenance, and disposal
- Light Rail vehicle design, acquisition, maintenance, and disposal
- Facility design, acquisition, maintenance, and decommissioning
- ITS design, acquisition, maintenance, and disposal
- Investment Prioritization Process
- Asset Management System



2. Leadership

- a. The chair of the Asset Management Accountability Team will be the executive representing the Asset Management System business function.
- b. The chair shall manage the team and its meetings.
- c. The chair shall appoint a vice chair who will perform the duties of the chair in the chair's absence or in the event of a vacancy in the office of chair.
- d. The chair has appointed the Senior Manager of Asset Management the duty to assist with meeting agendas and action recommendations.
- e. The chair has appointed a secretary who need not be a team member. The secretary shall prepare minutes of the team meetings for the team's approval.

3. Meetings

- a. The team will meet bi-weekly until ISO 55000 certification is achieved. Thereafter, they will meet monthly until the first recertification is achieved. Finally, they will meet quarterly in perpetuity to ensure continuing maturity and to maintain certification.
- b. Until certification is achieved, the team will meet with the CEO at least quarterly to report on progress toward certification using the ISO roadmap as the benchmark.
- c. The chair (or designee) shall provide e-mail notice of the time and place of all meetings to each member of the team, and to the CEO, no later than three days prior to each meeting. An agenda shall be attached to the e-mail notice.

REVIEW

The Asset Management Accountability Team shall review this charter on an annual basis and recommend any changes to the GM / CEO.

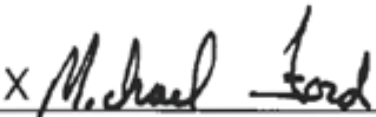



APPROVED BY



X 

David A. Genova
General Manager and CEO

SIGNATURES

X  X 

Michael Ford Mike Meader
COO CSO

X  X 

Heather McKillop Henry Stopplecamp
CFO AGM, Capital Programs

RTD AMD Recruitment schedule

	Week 1	Week 2	Week 3 /4	Week 3/4	Week 4/5
Posting					
Resume					
Testing					
Essay					
Interview					

Goal is 2.5 weeks from close of posting to job offer

Prep Work	Planned	As Needed	Desired	As Needed
-----------	---------	-----------	---------	-----------

1. Review Job Description
2. Determine alternative job posting locations (colleges, peer agencies, etc.)
3. Confirm or modify the following based on the needs of the division.
 - a. Essay/Written Interview questions
 - b. Test
 - c. In Person Interview guide
4. Create or confirm the following email templates:
 - a. "Received Application"
 - b. "You've Been Selected to participate in a Written Interview"
 - i. Includes the Testing dates (if applicable)
 - ii. Includes the In-Person interview dates.
 - c. "You've Been Selected to Test"
 - i. Again, includes the In-Person interview dates.
 - d. "Pursuing Different Applicants"
 - e. "Next Steps (In Person Interview)"
 - f. "Welcome"
5. Select Review Panel and schedule two interview dates with a 4-hour block each day.
 - a. This determines the initial posting date.
6. Create a schedule with the appropriate deadlines and send the following meeting requests:
 - a. Testing Dates
 - b. In-Person Interview Dates
7. Send complete schedule to all employees involved in the recruitment.

Posting	Planned	1 Week		
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8. HR posts job internally and or externally.
9. Send "Received Application" email to incoming applications.
10. Review application as they come in and process.

Building an Asset Management Team

Resume	Planned	1 Week	Desired	3 Days
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11. Review and process applications.
 - a. For internal candidates, review most recent performance appraisal and or speak with supervisor.
12. Select appropriate number of qualified/best fit applicants against requirements.
13. Send “You’ve Been Selected to Test / Written interview” email to those who qualify.
 - a. Notify with scheduled interview times.
14. Send “Pursuing Different Applicants” to those who do not qualify.

Essay / Written Interview	Planned	1 Week	Desired	3 Days
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15. Grade essays as they are received.
16. If a test is required, skip to step 20.
17. Send “Next Steps (In Person Interview)” email to those who passed.
18. Confirm applicant In-Person Interview timeslots determined in step 6.
19. Send “Pursuing Different Applicants” to those who did not pass the Essay/Written Interview.

Testing (if applicable)	Planned	1 Week	Desired	5 Days
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20. Send “You’ve been selected to test” email to those who qualify.
21. Confirm applicant testing timeslots determined in step 6.
22. Test & Grade.
23. Send “Next Steps (In Person Interview)” email to those who passed.
24. Confirm applicant In-Person Interview timeslots determined in step 6.
25. Send “Pursuing Different Applicants” to those who do not pass the test.

Interview	Planned	1 Week	Desired	3 Days
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26. Conduct In-Person Interview & Score.
27. Select candidate(s) & offer job.

Who does what in RTD AM Hiring

AMD will:

- When vacancies exist, it is best practice for the AMD Hiring Manager to evaluate departmental needs and determine whether changes to the position are warranted.
 - Create or modify Job Descriptions
 - If changes are necessary, the Hiring Manager submits changes to HR committee for review.
 - Some changes may necessitate completion of a Position Evaluation form.
 - Develop written interview – essay questions, grading guide (see examples in Appendix)
 - Develop specific skills test when they come in for face to face interview for specific roles (see examples in Appendix)
 - Face to face interview, with specific questions and grading rubric (see examples in Appendix)
 - Candidate selection tool utilizing a scoring system (see example in Appendix)
- Before the position is posted, the AMD Hiring Manager provides the HR Recruiter the following:
 - The test that is an evaluation of the applicant's knowledge, skills, and abilities to perform the essential functions of the job, including the corresponding key;
 - Interview questions, including behavioural and technical enquires related to the job and the corresponding guide; and
 - Identify a diverse interview panel.

The HR recruiter will:

- Review the test and key prior to posting but doesn't retain either;
- Review the interview questions and guide prior to posting;
- Review the interview panel prior to posting;
- Work with the hiring manager to determine posting type, advertising, and the length of the time a position is posted;
- Discuss with the hiring manager screening criteria/expectations;
- They may complete the initial screening of the candidates for minimum qualifications; and
- Manage appropriate and compliant interview practices.
 - The Federal Transportation Authority (FTA) requires that the Equal Employment Opportunity Office (EEO) review employment documents as they relate to recruitment and promotions to ensure that the actions of the District do not result in disparate treatment or disparate impact (see Circular No. 4704.1A). As such, the EEO Office collaborates with Human Resources to support the consistent application of the District's recruitment and promotion processes.

AMD will:

- Initiate the position posting / HR recruiter posts after all internal approvals
- Review incoming applications comparing each against the grading matrix and requirement
- Preschedule in-person interviews for panel (communicate dates to potential applicants)
- Send letters to applicants including details and anticipated schedule for process
- Send written interview questions to top tier applicants based on scores
- Review and score written interview questions, Schedules and administer tests
- Face to face interview top tier candidates
- If potential new teammate is found make a solid offer
- Execute on-boarding process

Structure for general grading:

Rate the quality of the data responses on a 1-5 scale where 1 is poor.

Grade against the following>

- Clarity of message
- Analytical thought and process / critical thinking
- Forthrightness, ability to tell it like it is
- Organization or structure
- Attention to detail
- Effort put forth, investment in the process
- Did something else about the response influence your assessment – please not so that it can be considered for future.

Rubric Grades

We grade each category on a four-point scale: Poor, Mixed, Good, and Excellent. We generally consider Mixed to be more No than Yes. It is the least useful rating you can give, so try to use it sparingly.

It is not essential that you grade a candidate in every category of every section on each question, so you should only grade those categories in which you can make a strong call, based on observable facts. However, if you are only able to confidently grade five or less categories, we will likely consider the interview format a failure, and work to discover why we aren't able to get a strong signal from it.

For each category that you provide a grade, you must provide a note that lists the observable facts that led you to choose that grade. Do not add a grade just to hit some minimum number of categories: if you are unsure about your performance as an interviewer, we can provide additional training. If the interview format does not help you get the signal you need, we can change it. Again the goal is to find the best people for the position so that both the applicant and RTD can succeed.

You will be provided with a sheet that lists the qualities we are looking for, to help you remember what you should be judging the candidate on, and provide space for you to note what you see and hear. This document is called "General Interview Grading Rubric".

Subjectivity and feelings

Interviewing is subjective, but in your written evaluation, try to stick to observable facts. Editorializing on someone's psyche or value system can be prejudicial, especially if what you write is interpreted by others without you being present to give more nuance. This subjectivity is the reason we have created the grading rubric to help us quantify our measures and reduce the introduction of biases or feelings.

For example: William won't admit when he doesn't know something, probably because he's is inexperienced. I don't think he'll be able to admit when he's wrong.

Lillian was very reluctant to describe her answer in detail, and talked in generalities instead of describing the situation, actions and solution.

If you have a really strong feeling and are convinced that you have to communicate it, make sure you separate the observable facts from your feelings, and communicate them first.

Bad: I think William is a misogynist.

Better: Even though I was giving the interview, and Peter was just shadowing, every time I asked a question, William gave the response to Peter. William asked Peter clarifying questions, but not me. This frustrated me, and makes me think William would have a problem working productively with a younger woman.

With these notes and using the grading rubric we should be able to make more informed hiring decisions.

Understanding Bias

As you are grading, remember this - we are all biased. That's ok, as long as we stay vigilant about it, and then adjust. It is our personal responsibility to understand and guard against biases that would impact our decisions. This is why discussions after interviews are necessary and give us the opportunity to discuss our scores and help each other grade as fair and consistently as possible. If at any time you feel that someone including yourself cannot be fair, you must act. If you are unsure what actions to take you are obligated to voice your concerns either directly to Lou Cripps or another panel member. The goal is to have open and direct conversations without judgement or reprisal.

Alignment

Each position test will be aligned to the job with the intent of differentiating between candidates who will be highly successful and those that will not. The process should rule out candidates that are not qualified but not those that possess the essential skills and qualifications. Our goal is to reach the largest more diverse talent pool possible.

Overall

You will be asked to give a final overall assessment of the candidate, Strong No, No, Yes, or Strong Yes.

We can teach someone who is weak in one or two technical categories, provided they have the right attitude and other key attributes that seem to be good indicators of success in asset management. It is harder to change a person's personality, or gain alignment with them on values than teach a skill.

Grading Guidelines

Below are general guidelines for how to think about each grade. There may be exceptions to this, at your discretion. Each case is unique, so exercise your best judgement. Although we are aiming to fill positions, it is still true that a bad hire can have far-reaching and wide-ranging consequences. You should consider that your reputation as an interviewer is attached to your recommendation.

Poor

Give an overall Strong No only if you think hiring the candidate would cause significant harm to RTD or Asset Management. A single overall Strong No from an interviewer is likely to result in rejection of the candidate in all but the most exceptional circumstances, even if other interviewers are in favor of the candidate. Be judicious in your use of this grade.

Mixed

Give a No if you think the candidate isn't right for RTD or Asset Management. Generally speaking, a Strong No in any of the personality or values categories will indicate at best an overall No, even if there are Strong Yes results for technical competencies. An overall No is also appropriate if the candidate has technical deficiencies that are too great to correct with reasonable on the job training. This will be typified by one or more Strong No results, or mostly No results in technical categories.

Good

Give a Yes if you think we should hire the candidate. Generally speaking, majority Yes and Strong Yes for personality and values categories may indicate an overall Yes, even if there are one or two technical No grades.

Excellent (A- Players)

An overall Strong Yes is a strong signal, and should be reserved for someone who you think we really need to have on our team. Be judicious in your use of this grade.

Measurement

We will measure success by creating a reliability and validity framework including structured interviewing that will have both face and predictive validity. Validity is important because it can help determine what types of processes to use, and help to make sure we are using methods that are not only efficient and effective, but also methods that truly measures the success in the outcome. The processes aims to be repeatable with validity in outcomes matching real world expectations in the success of candidates. This will be achieved with practice, test interview and continuous process improvements. Finally, do the people who score well and who are ultimately hired succeed in their positions?

General:

When creating questions: Separate out the interview questions into two groups. Don't mix tests type questions with interview questions.

The first group have actual best answers whereas the second group will not. Example: Split into Group A / Group B. Questions in group B are more about attributes and values and the overall package of questions should be designed to look for the attributes I believe will make for successful people on the team. There is some interplay between the questions (explain more – example what attributes do we have that we believe make you a good fit for this position? What attributes do we believe people need to be successful in most jobs? I want overlap – do you have the same attributes that you think others should have? And a person that sees attributes not as skills in both questions). Team discussions have led to the belief that personal attitudes, attributes and values are things that are harder to teach and train than technical skills.

I figure we are only trying to answer 4 questions to make a hire: do they understand what we need done in this job; do they have the knowledge, skills and abilities to do the job, do they have the drive, will, and discipline to actually do the job; finally how do they balance and fit into the team and organization (leadership, personality, diversity)? To this list I'd add that in each of the last three areas they need to be able to lead others and take full ownership.

This guide is open to continual improvement. Discussion on how to grade for certain categories is welcome, as are suggestions on improvements for clarity. However, the headline capabilities and component categories are unlikely to change unless there are significant changes to positions or functions or we discover new and better methods for finding the best candidates for jobs.

20 COGNITIVE BIASES THAT SCREW UP YOUR DECISIONS

<p>1. Anchoring bias. People are over-reliant on the first piece of information they hear. In a salary negotiation, whoever makes the first offer establishes a range of reasonable possibilities in each person's mind.</p> 	<p>2. Availability heuristic. People overestimate the importance of information that is available to them. A person might argue that smoking is not unhealthy because they know someone who lived to 100 and smoked three packs a day.</p> 	<p>3. Bandwagon effect. The probability of one person adopting a belief increases based on the number of people who hold that belief. This is a powerful form of groupthink and is reason why meetings are often unproductive.</p> 	<p>4. Blind-spot bias. Failing to recognize your own cognitive biases is a bias in itself. People notice cognitive and motivational biases much more in others than in themselves.</p> 
<p>5. Choice-supportive bias. When you choose something, you tend to feel positive about it, even if that choice has flaws. Like how you think your dog is awesome — even if it bites people every once in a while.</p> 	<p>6. Clustering illusion. This is the tendency to see patterns in random events. It is key to various gambling fallacies, like the idea that red is more or less likely to turn up on a roulette table after a string of reds.</p> 	<p>7. Confirmation bias. We tend to listen only to information that confirms our preconceptions — one of the many reasons it's so hard to have an intelligent conversation about climate change.</p> 	<p>8. Conservatism bias. Where people favor prior evidence over new evidence or information that has emerged. People were slow to accept that the Earth was round because they maintained their earlier understanding that the planet was flat.</p> 
<p>9. Information bias. The tendency to seek information when it does not affect action. More information is not always better. With less information, people can often make more accurate predictions.</p> 	<p>10. Ostrich effect. The decision to ignore dangerous or negative information by "burying" one's head in the sand, like an ostrich. Research suggests that investors check the value of their holdings significantly less often during bad markets.</p> 	<p>11. Outcome bias. Judging a decision based on the outcome — rather than how exactly the decision was made in the moment. Just because you won a lot in Vegas doesn't mean gambling your money was a smart decision.</p> 	<p>12. Overconfidence. Some of us are too confident about our abilities, and this causes us to take greater risks in our daily lives. Experts are more prone to this bias than laypeople, since they are more convinced that they are right.</p> 
<p>13. Placebo effect. When simply believing that something will have a certain effect on you causes it to have that effect. In medicine, people given fake pills often experience the same physiological effects as people given the real thing.</p> 	<p>14. Pro-innovation bias. When a proponent of an innovation tends to overvalue its usefulness and undervalue its limitations. Sound familiar, Silicon Valley?</p> 	<p>15. Recency. The tendency to weigh the latest information more heavily than older data. Investors often think the market will always look the way it looks today and make unwise decisions.</p> 	<p>16. Salience. Our tendency to focus on the most easily recognizable features of a person or concept. When you think about dying, you might worry about being mauled by a lion, as opposed to what is statistically more likely, like dying in a car accident.</p> 
<p>17. Selective perception. Allowing our expectations to influence how we perceive the world. An experiment involving a football game between students from two universities showed that one team saw the opposing team commit more infractions.</p> 	<p>18. Stereotyping. Expecting a group or person to have certain qualities without having real information about the person. It allows us to quickly identify strangers as friends or enemies, but people tend to overuse and abuse it.</p> 	<p>19. Survivorship bias. An error that comes from focusing only on surviving examples, causing us to misjudge a situation. For instance, we might think that being an entrepreneur is easy because we haven't heard of all those who failed.</p> 	<p>20. Zero-risk bias. Sociologists have found that we love certainty — even if it's counterproductive. Eliminating risk entirely means there is no chance of harm being caused.</p> 

SOURCES: Brain Biases; Ethics Unwrapped; Explorable; Harvard Magazine; HowStuffWorks; LearnVest; Outcome bias in decision evaluation, Journal of Personality and Social Psychology; Psychology Today; The Bias Blind Spot; Perceptions of Bias in Self Versus Others, Personality and Social Psychology Bulletin; The Cognitive Effects of Mass Communication, Theory and Research in Mass Communications; The less-is-more effect; Predictions and tests, Judgment and Decision Making; The New York Times; The Wall Street Journal; Wikipedia; You Are Not So Smart; ZhumalyWiki

BUSINESS INSIDER

AM General Interview grading rubric

Attribute/ Quality	Poor - 0	Mixed - 1	Good - 2	Excellent -3
Understanding of Requirements	Did not consider or research the elements or requirements of the position. May or may not be able to repeatedly describe the jobs primary function or requirements. In describing themselves failed to provide education and experience relevant to the position. Answers or materials provided are sloppy, have errors, or are incomplete. Failed to adequately prepare for the test or interviews.	Did limited research the elements or requirements of the position such as reading the job description and having some questions. May or may not be able to repeatedly describe the jobs primary function or requirements. In describing themselves did not provide enough detail about how their education and experience are relevant to the position. Answers or materials provided, have minor errors, or bur preparation for the test or interviews.	Evidence of researching the elements or requirements of the position. Able to repeatedly describe the jobs primary function or requirements. In describing themselves provided detail about how their education and experience are relevant to the position. Answers or materials provided, are free of errors, and are complete. Applicant shows some preparation for the test or interviews. Applicate asked insightful questions.	Demonstrated strong consideration of the position and their personal fit to both the position and the organization. Clear understanding of the position and requirement providing evidence of researching requirements of the position and other company information or legislative requirements. Able to repeatedly describe the jobs primary function and benefits to RTD. In describing themselves provided detail about how their education and experience are relevant to the position. Answers or materials provided, are free of errors, and are complete. Applicant shows some preparation for the test or interviews. Applicate asked insightful questions.
Ethics & Integrity - (binary competency)	Examples provided evidence of willingness to engage in unethical or misleading practices. FAIL The applicant should show perceived fairness, tolerance, honesty, consistent in application of all data, reporting, division and company policies and procedures.	Examples provided some evidence of personal and professional ethics and integrity. No evidence of unethical or misleading practices without clearly describing why the actions were wrong and will not be repeated. The applicant should show perceived fairness, tolerance, honesty, consistent in application of all data, reporting, division and company policies and procedures.	Examples provided evidence of strong personal and professional ethics and integrity. The applicant showed perceived fairness, tolerance, honesty, consistent in application of all data, reporting, division and company policies and procedures.	Examples provided evidence of strong personal and professional ethics and integrity. The applicant showed perceived fairness, tolerance, honesty, consistent in application of all data, reporting, division and company policies and procedures. Provided an example where values and personal integrity align with strong ethical practice.

Attribute/ Quality	Poor - 0	Mixed - 1	Good - 2	Excellent - 3
Cognitive Ability - Knowledge, Skills and Abilities	<p>Examples and evidence provided failed to demonstrate cognitive skills necessary for position including the ability to learn, to process and apply knowledge, to analyze and reason, and to evaluate and decide. Didn't read or understand the materials, questions provided. Was unable to draw inference from patterns or events. Examples provided didn't show problem solving thinking where several possible solutions were considered appropriate. No evidence of using things like brainstorming or options when looking to analyze outcomes or solutions. Lack in focus or attention to detail in tasks impacting delivery or causing undesired results. Didn't show the ability to observe or learn by observation.</p>	<p>Some examples with limited evidence demonstrating some cognitive skills including the ability to learn, to process and apply knowledge, to analyze and reason, and to evaluate and decide. Read and mostly understood the materials, questions provided. Did draw inference from patterns or events. Examples provided did show limited problem solving thinking where several possible solutions were considered appropriate. Possible use of things like brainstorming or options when looking to analyze outcomes or solutions. Had focus and/or attention to detail in tasks but did not deliver desired results. Application shows the ability to observe or learn by observation.</p>	<p>Examples and evidence demonstrating solid cognitive skills including the ability to learn, to process and apply knowledge, to analyze and reason, and to evaluate and decide. Read and understood the materials, questions provided and had follow up questions. Did conclude inference from patterns or events. Examples provided did show problem solving thinking where several possible solutions were considered appropriate. Evidence of using things like brainstorming or options when looking to analyze outcomes or solutions. Had focus and/or attention to detail in tasks delivering desired results. Application shows the ability to observe or learn by observation.</p>	<p>Examples provided clear evidence demonstrating solid cognitive skills including the ability to learn, to process and apply knowledge, to analyze and reason, and to evaluate and decide. Also, able to teach and coach others using knowledge, skills and abilities. Read and understood the materials, questions provided asking thoughtful follow up question. Did conclude inference from patterns or events. Examples provided show exceptional problem solving thinking where several possible solutions and outcomes were considered appropriate. Evidence of using things like brainstorming or options when looking to analyze outcomes or solutions. Had awareness, with the ability to detach or engage focus and/or attention to detail in tasks delivering desired results. Application shows the ability to observe or learn by observation.</p>
Fit, Balance & Diversity - Attitude - Drive Motivation	<p>Failed to demonstrate bias to action, failed to show ability to work with and without standards or rules. No evidence of structured thinking or organizational skills necessary for project execution. Lack of self-awareness, strengths and weaknesses. Lack of intrinsic motivation or being a person needing extrinsic motivation. No evidence of epistemic curiosity or desire to learn new concepts, ideas, or missing the internal intellectual interest driving a willingness to go beyond superficial exploration to find answers. Provided examples didn't show attention to detail or since of purpose. Little or no evidence of problem solving skills, openness to change, willing to deliver, recognition that delivery of product is required, focus, relationships and team, accuracy, ethics and integrity and diversity in thought.</p>	<p>Little demonstrated bias to action, shows limited ability to work with and without standards or rules. Missing or low level evidence of structured thinking or organizational skills necessary for project execution. Some self-awareness of strengths and weaknesses. Unable to determine motivations. Some evidence of epistemic curiosity or a desire to learn new concepts, ideas, or shows internal intellectual interest and drive to go beyond superficial exploration to find answers. Provided examples demonstrated some attention to detail or since of purpose. Some evidence of problem solving skills, openness to change, willing to deliver, recognition that delivery of product is required, focus, relationships and team, accuracy, ethics and integrity and diversity in thought.</p>	<p>Demonstrated bias to action, shows ability to work with and without standards or rules. Evidence of structured thinking or organizational skills necessary for project execution. Has self-awareness of strengths and weaknesses. Shows intrinsic motivation not needing extrinsic motivation to achieve results. Some evidence of epistemic curiosity or desire to learn new concepts, ideas, and has the internal intellectual interest driving a willingness to go beyond superficial exploration to find answers. Provided examples did show attention to detail or since of purpose. Clear evidence of problem solving skills, openness to change, willing to deliver, recognition that delivery of product is required, focus, relationships and team, accuracy, ethics and integrity and diversity in thought.</p>	<p>Demonstrated a need to act, shows ability to work with and without standards or rules. Clear evidence of structured thinking and organizational skills necessary for project execution. Clearly self-aware of strengths and weaknesses adapting to situations using personal strengths and those of others. Obviously intrinsically motivated. Able to get others to follow and breeds motivation in others. Provided examples where purpose and meaning were important to the applicant. Evidence of epistemic curiosity or desire to learn new concepts, ideas, or having the internal intellectual interest driving a willingness to go beyond superficial exploration to find answers. Provided examples showed attention to detail and/or since of purpose. Strong evidence of problem solving skills, openness to change, willing to deliver, recognition that delivery of product is required, focus, relationships and team, accuracy, ethics and integrity and diversity in thought.</p>

Attribute/ Quality	Poor - 0	Mixed - 1	Good - 2	Excellent - 3
<p>Tenacious (Grit)</p>	<p>Failed to convey examples that showed grit and/or didn't seem to make sound decisions after weighing alternatives; immobilized rather than making judgement calls that were "most reasonable" and which they are "relatively certain" based on available information. No evidence of personal ownership. Combative or adversarial when faced with situations requiring determination or sustained effort not partnering with others. Not willing to reevaluate adequacy of judgment call as new data or methodologies became available.</p>	<p>Showed some positive and some negative evidence in examples that showed grit and/or did/ didn't seem to make sound decisions after weighing alternatives; always looked to others rather than making judgement calls that were "most reasonable" and which they are "relatively certain" based on available information. Little evidence of personal ownership. Not combative or adversarial when faced with situations requiring determination or sustained effort may or may not have partnered with others. Reluctance to reevaluate adequacy of judgment call as new data or methodologies became available.</p>	<p>Provided good general examples that showed grit and/or did seem to make sound decisions after weighing alternatives; acted making judgement calls that were "most reasonable" and which they are "relatively certain" based on available information. Partnering and collaborative when faced with situations requiring determination or sustained effort. Evidence of personal ownership. Provided information to necessary managers or stakeholders keeping others informed of what and why. Willing to reevaluate adequacy of judgment call as new data or methodologies became available.</p>	<p>Provided excellent examples that showed grit and determination and/or did seem to make sound decisions after weighing alternatives; acted making judgement calls that were "most reasonable" and which they are "relatively certain" based on available information. Proactively aware of the need to collaborate and garner support when faced with situations requiring determination or sustained effort. Able to detach from the situation and take an outside perspective seeing situations from the vantage point of others. Provided what / why and how information to necessary managers or stakeholders keeping other others informed and involved. Took personal ownership. Willing to reevaluate adequacy of judgment call as new data or methodologies became available.</p>
<p>Openness to change</p>	<p>Demonstrated resistance to change. No recognition of needed changes. Limited willingness to support change presented. Negative descriptions or emotions expressed towards either change or the potential consequences of change. Apparent missing appetite or drive to enact or be involved in change. Applicant had a perception of threat that changes present without balanced optimism towards benefits.</p>	<p>Difficultly recognizing needed changes. Cautious willingness to support change presented. Neutral descriptions or emotions expressed towards either change or the potential consequences of change. Appetite to be involved or enact only select in change. Applicant had a balanced perception of threat that changes present with equal optimism towards benefits. Expresses a level of trust towards the organization and people around them to handle change well. Good examples of change and the methods used to achieve successful change implementation.</p>	<p>Recognizes needed changes and is open to the changes. Clear support and positive descriptions or emotions expressed towards either change or the potential consequences of change. Expresses interest in helping others through times of change. Appetite to be involved or enact needed change. Shows an understanding of the frameworks of flexibility to support efforts. Applicant had a balanced perception of threat that changes present with equal optimism towards benefits. Expresses an informed level of trust towards the organization and people around them to handle change well. Good examples of change and the methods used to achieve successful change implementation. Has a sense of ownership in the control perceived in the change effort and related processes.</p>	<p>Recognizes and embraces needed changes and is open to the changes. Clear support and positive descriptions or emotions expressed towards either change or the potential consequences of change. Expresses interest in helping others through times of change. Appetite to be involved or enact needed change. Shows an understanding of the frameworks of flexibility to support efforts. Applicant had a balanced perception of threat that changes present with equal optimism towards benefits. Expresses an informed level of trust towards the organization and people around them to handle change well. Good examples of change and the methods used to achieve successful change implementation. Has a sense of ownership in the control perceived in the change effort and related processes.</p>

Attribute/ Quality	Poor - 0	Mixed - 1	Good - 2	Excellent -3
Problem Solver	Failure to solve even simple obvious problems. Missing the four basic steps in problem solving. Did not define the problem, didn't generate or consider alternatives, did not evaluate nor select alternative, and did not implement a solution or test if the solution fixed the problem.	Solves simple obvious problems but may have missed one or more of the key steps in problem solving. Define the problem, generate or consider alternatives, evaluate / select alternatives, and implement a solution including testing if the solution fixed the problem. Example of failures could include; Did not define or ensure core problem and not symptom. Did not recognize the complexity.	Solves simple obvious problems and uses the key steps in problem solving. Define the problem, generate or consider alternatives, evaluate / select alternatives, and implement a solution including testing if the solution fixed the problem. Evidence supporting the use of a system or framework for problem solving.	Provided evidence and examples of problem solving. Was able to articulate their thought process and the steps they used. Clearly showed the steps in problem solving. Define the problem, generate or consider alternatives, and evaluate / select alternatives, and implement a solution including testing if the solution fixed the problem. Using established tools and techniques they improve their approach to solving problems and challenges moving into proactively identifying causes.
Other desired attributes				
Managerial Skills	Set goals, see the big picture, solve problems, handle details, plan projects, analyze, find resources, work well with others, obtain maximum productivity from others, gain cooperation, implement changes, supervise others, plan workflow, mediate staff conflicts, delegate, think globally.			
Organizational/ Planning Skills	Structure events, coordinate people and details, organize tracking or filing systems, set timelines, forecast, determine priorities, manage all aspects of large or multiple projects; develop alternatives, determine resources, solve problems; see the big picture and all the interacting components too, pay attention to the tiniest details, gather support and cooperation from others.			
Communication Skills	Exchange ideas, use probing questions to determine needs of others; sell services/ideas; persuade others to do what you want, use humor, tell stories, entertain others, write messages that clearly get across your meaning, teach or train, make impassioned pleas, edit comprehensive reports/proposals, express creativity, use vocabulary/grammar/language skills effectively, edit reports/publications, make speeches.			
Leadership Skills	Lead, motivate others, cause change, make decisions, be a visionary, forecast, recognize opportunities, praise others, direct projects and individuals.			
Analysis	Converting data to information using apococate context and tools; understanding, use and creation of cost spreadsheets, forecasting, modeling, price comparisons, using charts/graphs to convey information, financial analysis. Using computers, knowledge about system networks, skill in a specific software, research, analyze data, interpret results, organize large volumes of information, evaluate options considering pros/cons and consequences, design efficient systems, collect and process information in user-friendly form, diagnose problems, determine workable solutions, seek more efficient procedures, produce technical reports/surveys or questionnaires, investigate, make new discoveries, implement new systems, test new ideas/processes/procedures/systems.			
Interpersonal Skills	listening, empathy, sensitivity to others; rapport builder, deal effectively with conflicts, social interactor, help others, share ideas, solve problems, adviser, mediator, bring people together, collaborator, facilitator			

We are trying to build an asset management focused organization that is productive, effective efficient, with happy people. We can only do that by hiring great people who have the attributes necessary to succeed. Interviewing is one of the most important responsibilities you have; your feedback on candidates will determine how the division and RTD evolves.

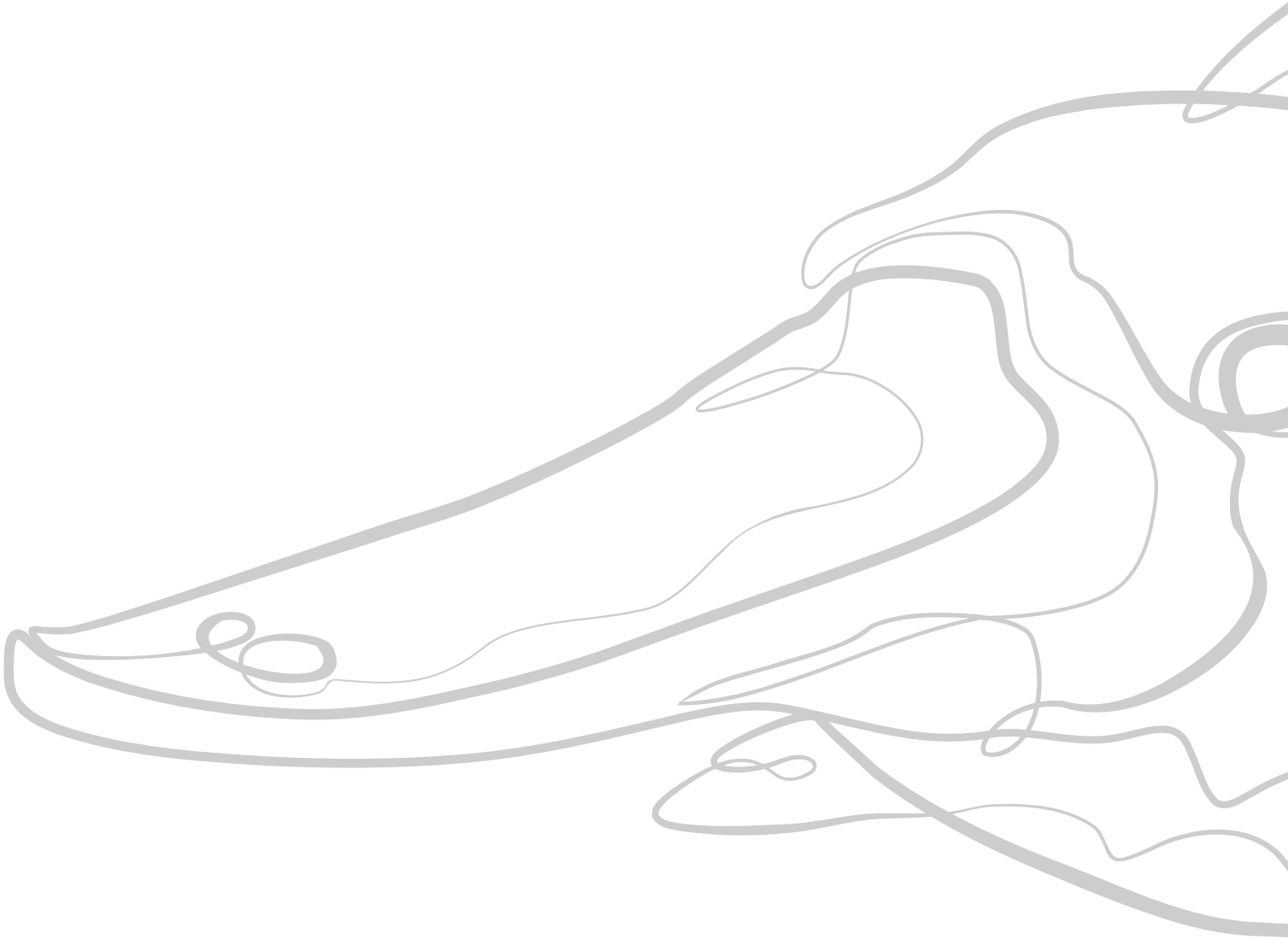
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Employee Performance Evaluations and Tracking example

Score	COMMUNICATION (D)	ANALYSIS/PROBLEM SOLVING	WORKLOAD MANAGEMENT (D)	ETHICS & INTEGRITY	SUPERVISION	INNOVATIVE	CONCEPTUAL THINKING	Score	OBJECTIVES
D	Uses coaching skills, good listener, clear and concise communicator, empathetic, respectful of others	Provides feedback on performance throughout the year, initiates performance plans and disciplinary prepare and present appraisal to salaried employees within thirty days of due date, consistently follows the CEA in performance management of represented employees.	Timely completion of assignments and projects, willingly undertakes special assignments, manages time to address tasks during normal working hours. Exceeded Expectation +1 Meets Expectation = 0 Failed Expectation -1	Perceived fairness, tolerance, honesty, consistent in application of policies and procedures.	Provides feedback on performance throughout the year, initiates performance plans and disciplinary prepare and present appraisal to salaried employees within thirty days of due date, consistently follows the CEA in performance management of represented employees.	Makes appropriate and sound decision after weighing alternatives; follows policies and procedures with careful consideration for rider's questions; logical.	Specialty field of knowledge is up to date and properly applied.	D	Objective can be overarching and broad or they can be very specific. Provide excellent customer service would be a broad objective.
5	The employee should have been recognized with a letter of commendation or award for their communication efforts by an external department or audience.	The employee should have been recognized for their performance management efforts by an external department or audience.	The employee should have been recognized for their adherence to FTD policy when presented with a difficult circumstance by an external department or audience.	The employee should have been recognized for their adherence to FTD policy when presented with a difficult circumstance by an external department or audience.	The employee should have been recognized for their supervision efforts by an external department or audience.	The employee should have been recognized for their sound judgment by an external department or audience.	The employee should have been recognized for their applied knowledge by an external department or commendation, annual comm laude or magna cum laude designation.	5	The employee should have been recognized for their efforts surrounding the objective.
4	In addition to the requirements for a 5, the employee has made a well prepared presentation to an audience that is not part of the asset management division.	Employee has exceeded their weekly goals for at least 7 weeks for the quarter.	Employee has exceeded their weekly goals for at least 7 weeks for the quarter.	Employee has exceeded their weekly goals for at least 7 weeks for the quarter.	In addition to the requirements for a score of 5, motivates all direct reports to aspire to score a 4 on at least two objectives for the year. This is evidenced by the Objective Worksheet being completed by the direct report for two or more objectives each year.	TEU The employee has actively sought an opportunity to learn new skills through internal or external programs and certifications. And the new skill will be evidenced through successful passing score) testing or teaching the subject to others.	A SMART goal has been presented by the employee, agreed upon by the supervisor, and fulfilled.	4	A SMART goal has been presented by the employee, agreed upon by the supervisor, and fulfilled.
3	The employee communicates necessary information based on audiences. The employee actively participates (written & verbal) in status meetings (weekly team & monthly division).	Employee has met their weekly goals for at least 10 weeks for the quarter.	Employee has met their weekly goals for at least 10 weeks for the quarter.	The employee adheres to the established division, department, and FTD's policies and procedures. The employee gives 40 hours of work for 40 hours pay.	Completes all quarterly reviews with employees and completes all annual appraisals on time. Ensures that all employees are reporting their work in weekly status updates.	The employee accepts that complete understanding is not always possible, but they are not intimidated by this; rather, they make judgments based on available data. They are willing to reevaluate the adequacy of their judgments as new data or new information becomes available.	The employee has completed the objective in the agreed upon timeframe.	3	The employee has completed the objective in the agreed upon timeframe.
2	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	2	The employee occasionally fails to meet the objective forward in a timely manner.
1	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	Occasionally fails to meet the example detailed in a score of 3.	1	The employee occasionally fails to meet the objective forward in a timely manner.

Example of RTD AMD 'Book Club' Schedule

Week	International Case Studies in Asset Management, Edited by Chris Lloyd	Pages	Read to:
6/7/2017		21	2.2
6/14/2017	Review	42	3.4
6/21/2017		63	5.3
6/28/2017	Review	84	7.3
7/5/2017		105 (107)	Chapter End
7/12/2017	Review	126	10.5
7/19/2017		147 (144)	13.1
7/26/2017	Review	168	15.6
8/2/2017		191	17.4.1
8/9/2017	Review	212	Complete





'A lovely tone, nothing surplus to requirements, a real page turner for anyone trying to set up a team. I especially liked the 'what not to do!'

Dr Penny Burns,
Talking Infrastructure

'It isn't like anything I have ever read on asset management. I wish it was available when we started out on our AM journey!'

Krista Halayko,
Manitoba Hydro

'This should be a pocketbook series'

Tina Ignat,
METRA Railroad

'This guide is exactly what people need - it's accessible and, above all, helpful'

Ark Wingrove,
KOMPAS

