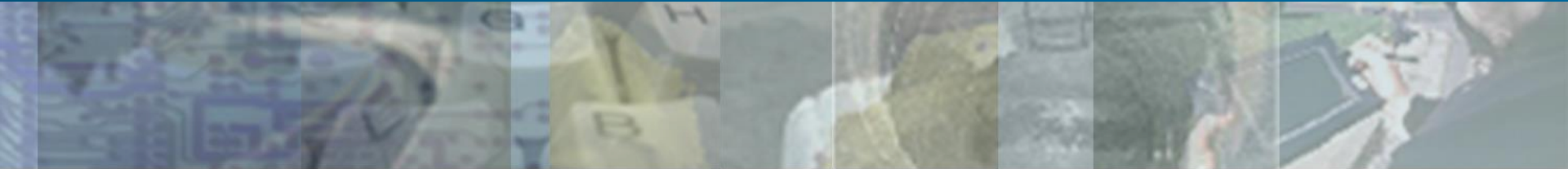




Asset Management For Small Municipalities

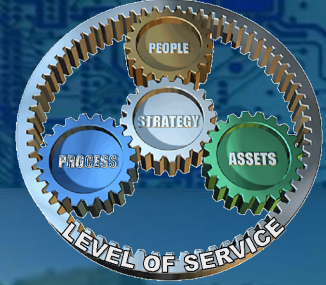


Presented to: Infrastructure AM Alberta,

Steve Wyton, City of Calgary

Manager, Corp. Project & Asset Mgmt

October 08, 2014



ISO 55000 Framework

Organizational Strategic Plan (OSP)
 Vision, mission, values, business policies, stakeholder requirements, goals and risk management

Asset Management Policy
 Mandated requirements, overall intentions & principles and framework for control of asset management

Asset (Management) Strategies
 Long term chosen approach to value realization for the management of specified assets

Asset Objectives
 Specific & measurable outcomes required of assets and asset systems

Strategy for the Asset Management System
 Long term approach to the improvement of the asset management system

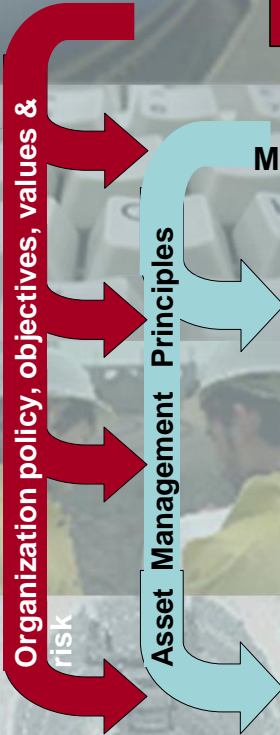
Objectives for AM system
 Specific & measurable outcomes required of the asset management system

Asset Management Plans
 Actions, responsibilities, resources and timescales intended to implement the asset management strategy and deliver the asset management objectives

Plans for improving asset management system
 Actions, responsibilities, resources and timescales intended to improve the asset management system itself

Life Cycle activities

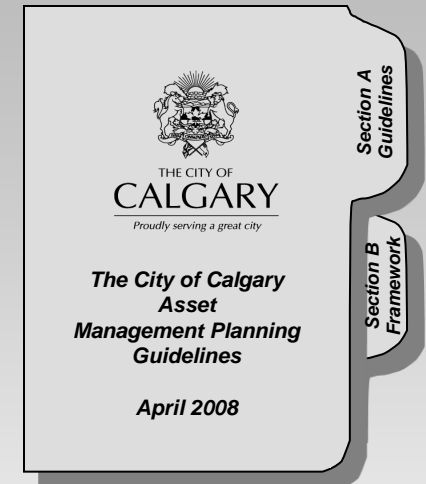
AM processes, procedures, competencies & techniques

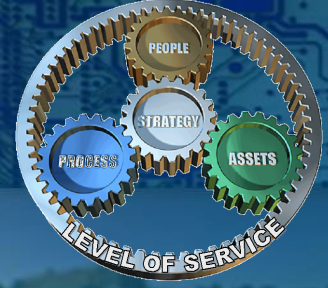




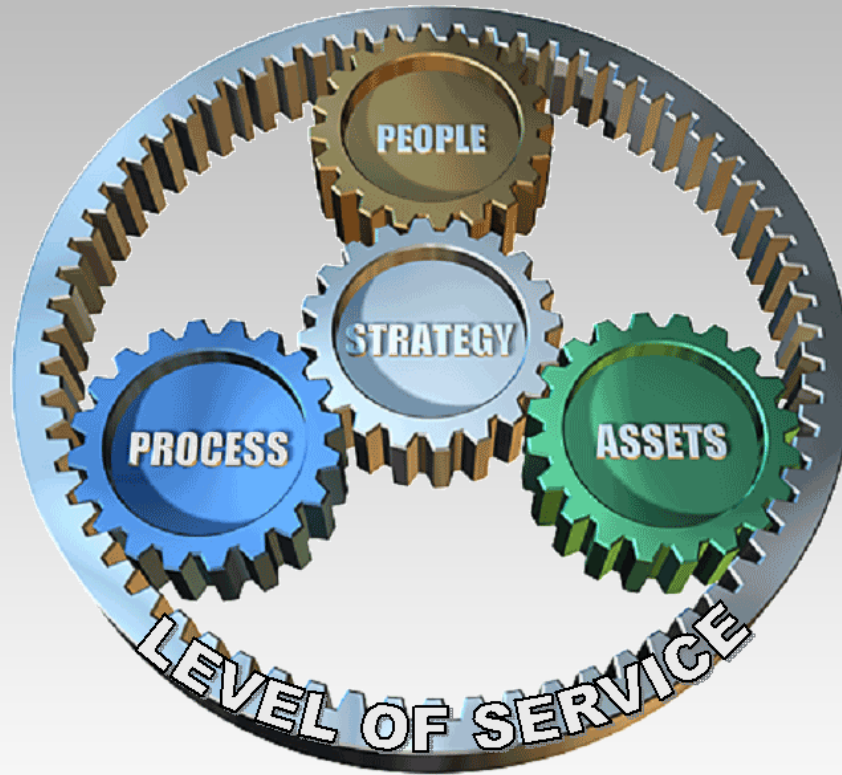
The Asset Management Plan (AMP) “The Heart of Asset Management” Tying it All Together

1. EXECUTIVE SUMMARY
2. BACKGROUND
3. MANAGING THE ASSETS LIFECYCLE
4. AMP DRIVERS AND ASSUMPTIONS
5. LEVELS OF SERVICE (LOS)
6. RISK & FUTURE DEMAND
7. FINANCIAL FORECASTS
8. ASSET MANAGEMENT PRACTICES
9. PLAN IMPROVEMENT AND MONITORING
10. APPENDICES
 1. Appendix 1 - Asset Data Confidence
 2. Appendix 2 - Asset Condition Rating Scale
 3. Appendix 3 - Detailed capital expenditure forecasts
 4. Appendix 4 - Detailed operational expenditure forecasts
 5. Appendix 5 - Summary of major asset categories
 6. Appendix 6 - Asset Management Plan Improvement



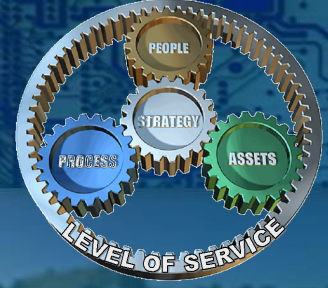


Asset Management Should Focus on: Strategy, Assets, People and Processes



“Asset Management is a business process and decision-making framework...(it) incorporates the economic assessment of trade-offs among alternative investment options and uses this information to help make cost effective investment decisions.”

City of Calgary AM Strategy, 2004



Calgary's Corporate AM System (simplified, modified from PAS 55)

Corporate Strategy

Asset Management Policy
AM Strategy & Objectives
Asset Management Plans

Plan - Do - Check - Act

**Infra
Planning
(AM Plan)**

**Infra
Invest
(Cap Budget)**

**Infra
Delivery**

**Infra
Perf.
Measure
(ISR)**

**Adjust &
advocate
Infra
Sustain**

People Competencies

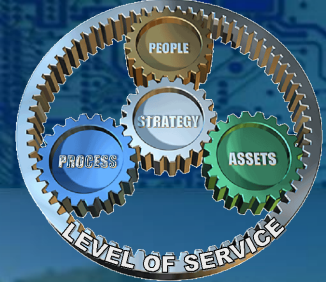
Information Systems

Efficient Processes

Asset Information / Data

TBL, Service & Risk Mgmt Philosophy

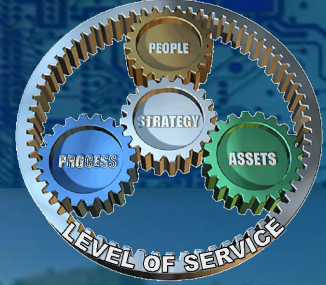




AM System Criteria: PAS 55 / ISO 55000



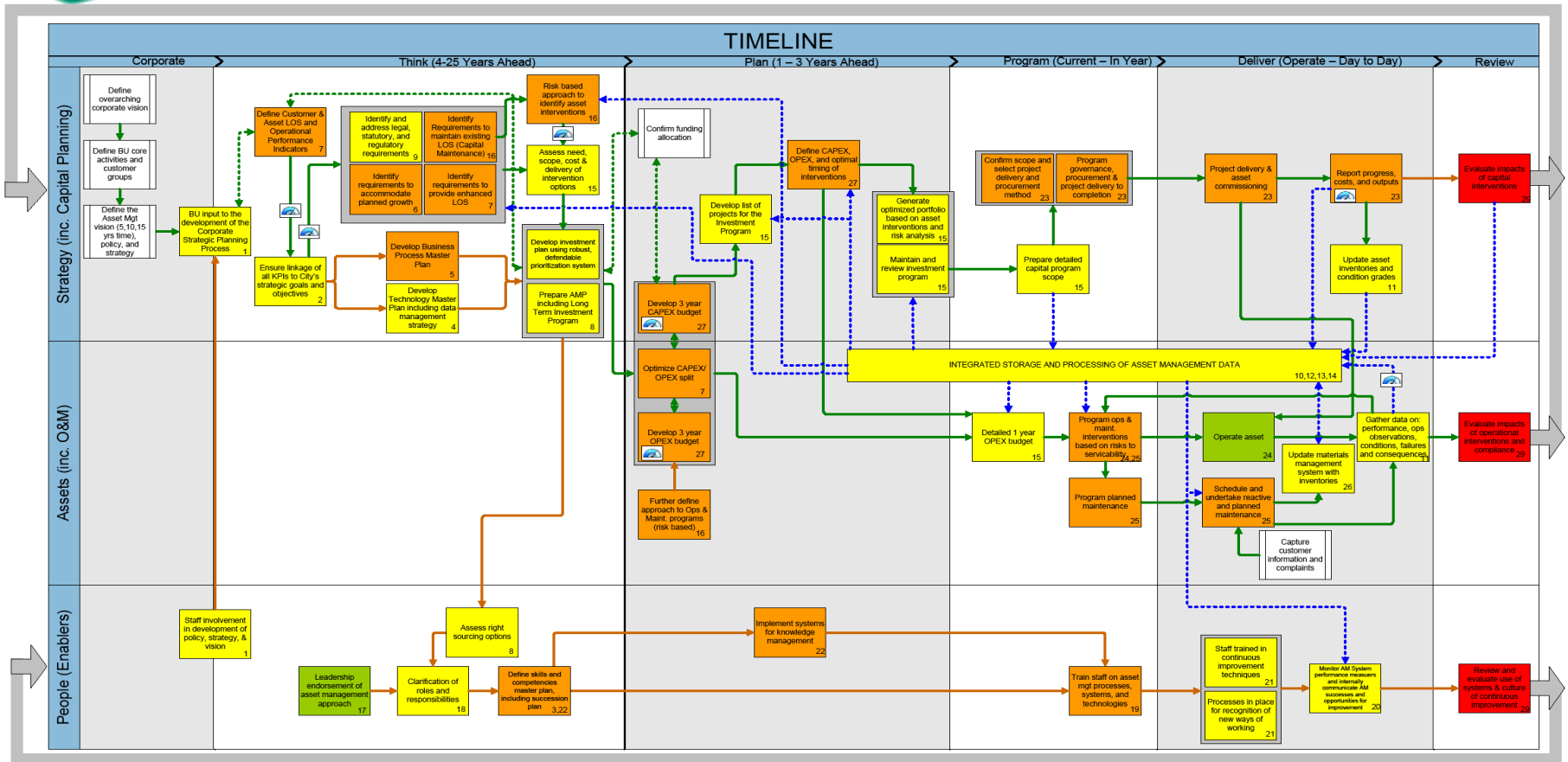
City of Calgary Asset Mgt Assessment	
Strategy	1 Overall Strategic Planning 2 Asset & Customer Levels of Service 3 Corporate LOS & Targets 4 People Skills & Competencies Master Planning 5 Technology Assets Planning 6 Business Process Mapping 7 Future trends (Impact of growth) 8 Asset Management Plan and Master Plans 9 Legal, Regulatory & Statutory Requirements
Assets	10 Asset Registry 11 Asset knowledge 12 Data Maintenance 13 Business applications 14 Technology Systems Integration Asset Investment Plans (AIP) Development & 15 implementation 16 Risk Framework - BU level and Asset level
People	17 Asset Management Leadership & Governance Roles & Responsibility Clarity, Empowerment & 18 Teamwork, Leading Change 19 Learning and Development 20 Communication and Information sharing 21 Continuous improvement culture (sustainability) 22 Knowledge retention & Succession planning
Processes	23 Capital projects - Planning, design & construction 24 Operations Management 25 Maintenance Management 26 Materials Management 27 Financial 28 Asset Process Flow 29 Asset Management Quality Assurance



The Asset Management System



ASSET MANAGEMENT SYSTEM BUSINESS MODEL: CITY OF CALGARY ROADS ASSESSMENT



PROCESS ASSESSMENT

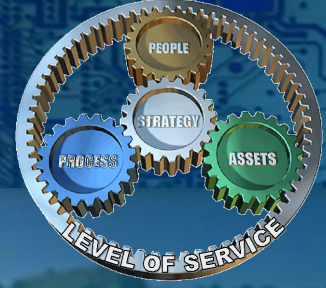
Numbers in bottom corner of box indicate assessment question number

Assessment results are color coded:

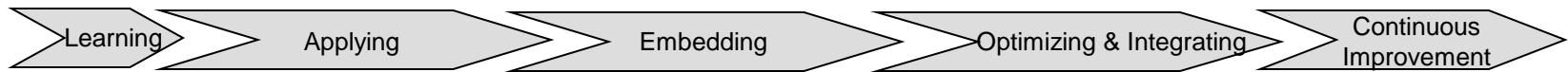
- 1 - Inception
- 2 - Initiation
- 3 - Development
- 4 - Completion
- 5 - Excellence

- AM Process Flow
- AM Support Interface
- Data Source and Flow
- Iterative Process Step

- Asset Mgt System Performance Measure
- Process steps, not a specific BU competency



Asset Management Assessment - Maturity Scale



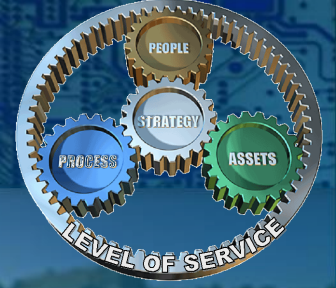
Maturity Level 1

Maturity Level 2

Maturity Level 3

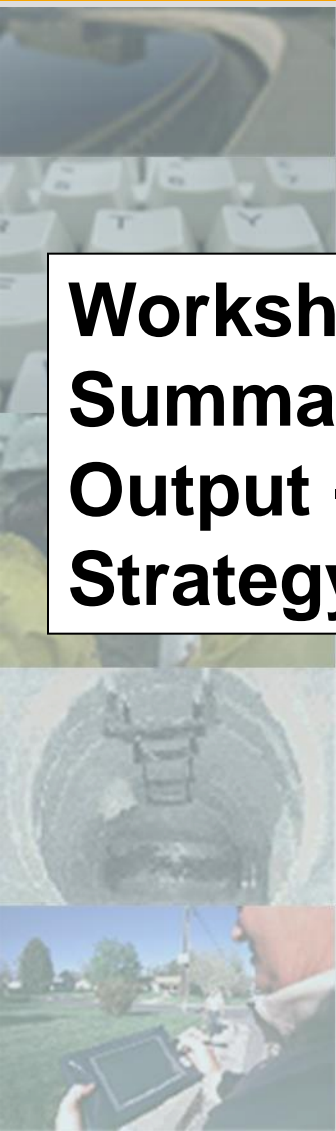
Maturity Level 4

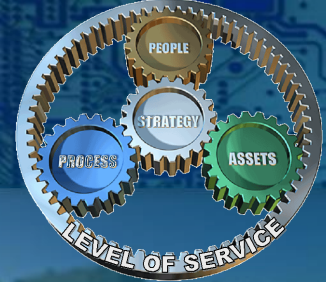
Maturity Level 5



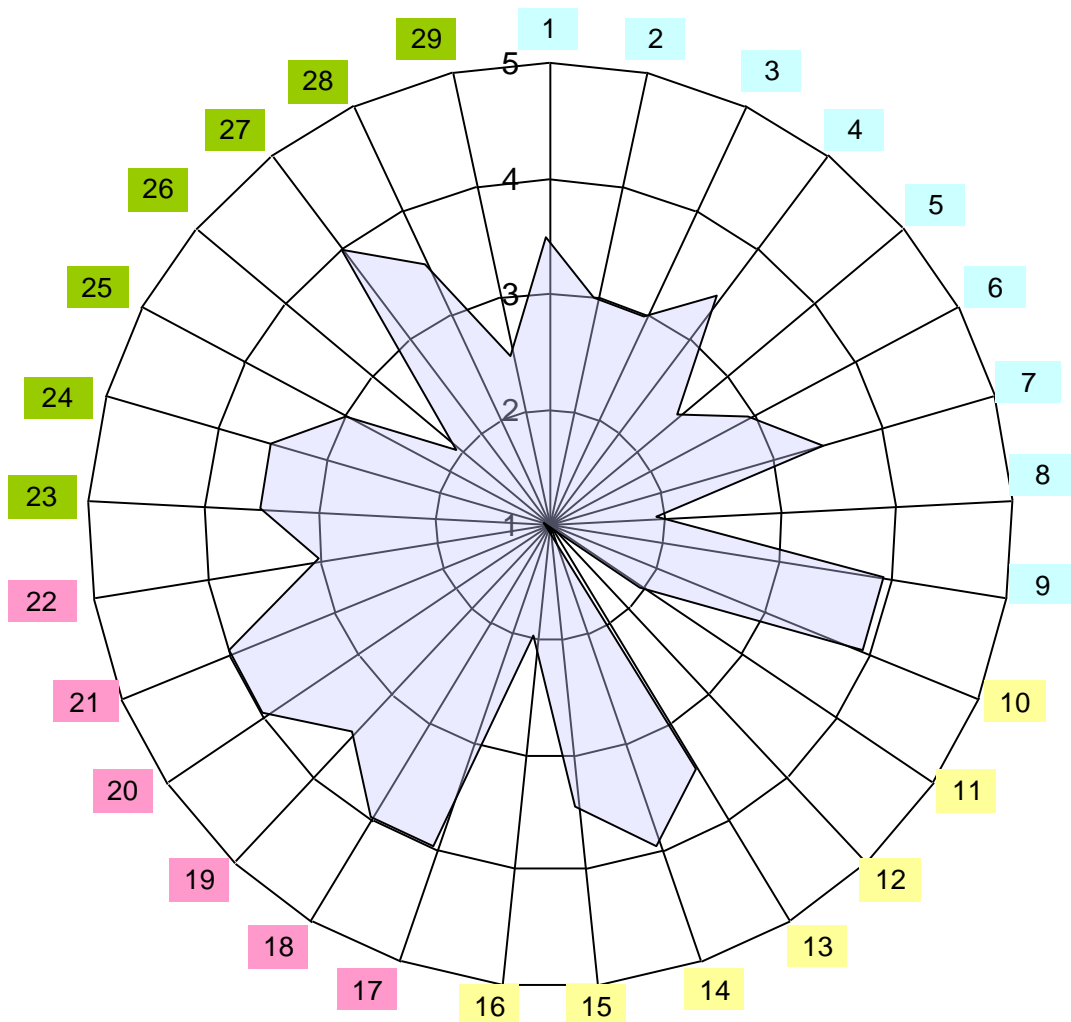
Asset Management Focus Area		Score Descriptions					
		1	2	3	4	5	
Strategy							
Q1	Overall Strategic Planning		Transit (F) W&R Transit (V)	EMS Fire Water Park CPB (F) CPB (V)	Rec Park		
Q2	BU Targets & Key Performance Indicators		Transit (F) W&R Rec IT Transit (V) CPB CPB (F)	EMS Fire Water Park CPB (F)	Rec Fire	Fire	
Q3	People Skills & Competencies Master Planning	IT	W&R Transit (F) EMS Rec Rec Transit (V) Water Fire CPB (F) CPB (V)	Park		Fire	
Q4	Technology Assets Planning	W&R CPB (F) CPB (V)	Transit (F) EMS Transit (V) IT Water Park Rec	Fire Rec Fire Rec	Fire Rec		
Q5	Business Process Mapping	W&R Transit (V) Fire CPB	Transit (F) EMS IT CPB (F)	Rec Park Rec	Water	Fire	
Q6	Future trends (Impact of growth)		Transit (F) W&R IT Fire Park CPB CPB (F)	Rec Rec Water EMS Fire		Transit (V)	
Q7	Level of Service	CPB	Transit (V) Transit (F) W&R IT CPB (F)	Fire Rec Rec Rec	Rec EMS Park	Fire	
Q8	Asset Management Plan and Master Plans	W&R EMS	Transit (F) Rec Fire Water CPB CPB (F)	Transit (V) IT Rec Park			
Q9	Legal, Regulatory & Statutory Requirements	Fire	Transit (F) Transit (V) EMS	Rec Rec Water Park CPB CPB (F)	Rec W&R Park CPB CPB (F)	Fire IT	Water

Workshop Summary Output - Strategy





Business Unit “AM Maturity” Current State

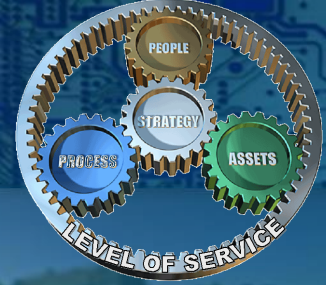


City of Calgary Asset Mgt Assessment

- | Category | Sub-Category |
|-----------|-----------------------------------------------------------|
| Strategy | 1 Overall Strategic Planning |
| | 2 Asset & Customer Levels of Service |
| | 3 Corporate LOS & Targets |
| | 4 People Skills & Competencies Master Planning |
| | 5 Technology Assets Planning |
| | 6 Business Process Mapping |
| | 7 Future trends (Impact of growth) |
| | 8 Asset Management Plan and Master Plans |
| | 9 Legal, Regulatory & Statutory Requirements |
| Assets | 10 Asset Registry |
| | 11 Asset knowledge |
| | 12 Data Maintenance |
| | 13 Business applications |
| | 14 Technology Systems Integration |
| | Asset Investment Plans (AIP) Development & implementation |
| | 16 Risk Framework - BU level and Asset level |
| People | 17 Asset Management Leadership & Governance |
| | Roles & Responsibility Clarity, Empowerment & |
| | 18 Teamwork, Leading Change |
| | 19 Learning and Development |
| | 20 Communication and Information sharing |
| Processes | 21 Continuous improvement culture (sustainability) |
| | 22 Knowledge retention & Succession planning |
| | 23 Capital projects - Planning, design & construction |
| | 24 Operations Management |
| | 25 Maintenance Management |
| | 26 Materials Management |
| | 27 Financial |
| | 28 Asset Process Flow |
| | 29 Asset Management Quality Assurance |

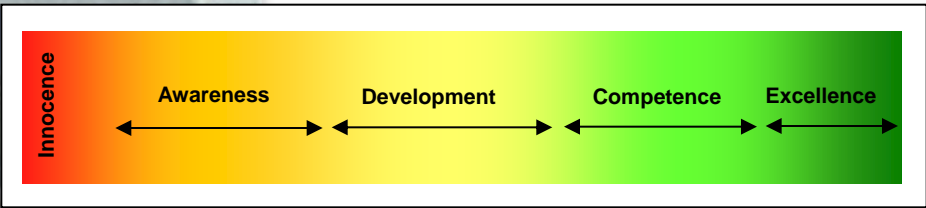
City of Calgary CAMP Asset Management Assessment										
Asset Management Focus Area		Score Descriptions					Current Score	Short Term 2008	Medium Term 2009/11	Long term 2012/17
		1	2	3	4	5				
63	People Skills & Competencies Master Planning	The BU has not considered the need for a people skills & competencies master plan aimed at setting out the short, medium and long term skills, competencies requirements	The BU is in the process of creating a master plan covering the short, medium and long term requirements for its staff (taking into account new technologies and changing S etc)	The BU have completed the master plan for the short and medium term, but this has had limited staff involvement.	BU Management are clear on long term structures, roles, responsibilities, competencies and staffing numbers. Recruitment and retention strategies have been developed with HR and are regularly reviewed. Strategic L has involved staff and has been communicated out	BU management have a long term staffing and skills plan, that has been developed with input from staff from all levels of the organization. Plan has been communicated out to all staff. Plan is updated periodically with input from other business units.	2	2	3	4
7	Technology Assets Planning	No documented IT Master Plan in place (either for all Enterprise solutions or AM) - reactive approach to hardware and software needs, very little technology in use - Staff don't see technology as being useful	IT Master Plan for Asset Mgt is under development, but is not widely publicized and does not have input from end users.	Documented IT Master Plan for Asset Mgt in place - core systems (e.g. CWMS) implemented and being used at a basic level (generally by supervisory staff)	IT Master Plan in place for asset mgt - core systems (e.g. CWMS) implemented and being used at an advanced level frontline staff use technology on a daily basis to enable work practices. An AMS is used to model and manage the useful life of the assets. Plan is communicated to staff.	'Well documented and understood IT Master Plan for asset mgt in place. This is integrated into an overall IT master plan covering all business activities. This is updated annually and ensures the most appropriate mix of Technology assets, with appropriate interfaces, is in place to enable optimized AM Practices. End users are actively engaged in managing technology assets and feedback enables system to be optimized.	2	3	4	4
8	Business Process Mapping	The BU has not carried out any Asset Mgt business process mapping.	Business Process mapping has been done for certain asset mgt activities, but is now largely out of date due to re-organizations and changes to ways of working. Little involvement of Business Unit Staff in the creation of the plans. No clear strategy/master plan in place for which processes are to mapped and what the priorities are.	A plan is in place for carrying out process mapping for all key asset mgt activities and progress is being made on the documenting the processes. Staff are engaged in the development of the processes.	A clear strategy is in place which sets out the justification and detail for process mapping. Business Process Mapping has been carried out for all identified asset mgt activities. S is in place for M review of L to staff.	A long term plan is in place identifying the need for revised or new process mapping and is under regular review. Staff are aware of the need to optimize processes and highlight where in-efficiencies or organizational change are leading to processes requiring review, thereby enabling Business Process mapping to be driven both top down and bottom up. The asset mgt business process master plan is fully integrated into an overall business process master plan covering all business	3	3.5	4	4
9	Future trends (Impact of growth)	No understanding of how future trends and growth will affect asset base and	Some understanding of effects of growth and future trends but not documented and only for certain asset groups.	Assessments carried out and documented by the BU showing 20yr+ projections for demand and the impact on assets. Options and costings exist for S the gap. No or only limited cross reference M been carried out M the growth	Long term assessments have been carried out and consistent with those of other BU's and align with City of Calgary corporate projections. Sensitivity analysis has been included for key asset groups L term	Detailed modeling has been undertaken to assess the impact of projected demand increases and population movement and hence an accurate assessment of the impact at asset levels can be made. This information is then used	3	3	3	4

BU Workshop Output
- defining the 'to be'



Maturity Assessment and Improvement Planning Overview

	Current														Short Term (2008)														Medium Term (2009 - 2011)														Long Term (2012 - 2017)													
	Roads	Water	Fire	IT	W&R	Recreation	EMS	Fleet	Transit (F)	Transit (V)	Parks	Properties (L)	Properties (F)	Roads	Water	Fire	IT	W&R	Recreation	EMS	Fleet	Transit (F)	Transit (V)	Parks	Properties (L)	Properties (F)	Roads	Water	Fire	IT	W&R	Recreation	EMS	Fleet	Transit (F)	Transit (V)	Parks	Properties (L)	Properties (F)	Roads	Water	Fire	IT	W&R	Recreation	EMS	Fleet	Transit (F)	Transit (V)	Parks	Properties (L)	Properties (F)				
Overall Strategic Planning	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
BU Targets & KPI's	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
People & Skills Master Plan	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Technology Assets Plan	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Business Process Mapping	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Growth	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Level of Service	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
AMP and Master Plans	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Legal, Reg. & Stat. Reqs	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Asset Registry	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Asset knowledge	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Data Maintenance	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Business applications	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Tech. Systems Integ.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
IIP Dev. & impl.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Risk Framework	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Asset Mgt Leadership & Gov.	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Role & resp. Clarity	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Learning and Development	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Comms and Info.sharing	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Continuous imp. culture	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Knowledge reten. & Succ.plan	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Capital projects	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Operations Management	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Maintenance Management	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Materials Management	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Financial	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Asset Mgt	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
Audit & Review	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3				



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2. The Asses

Comprehensive Approach

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3. V

Attendee
6th Dec
2007

Topic

1 – Overall Strategic Planning

2 – BU and K

3 – Performance Effectiveness Master

FI
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4. Con

Strategy Cre
Strategic plan
Comparing the
identify plan
reveal drivers
vision. A com
be realized. A
prioritize and
manageable

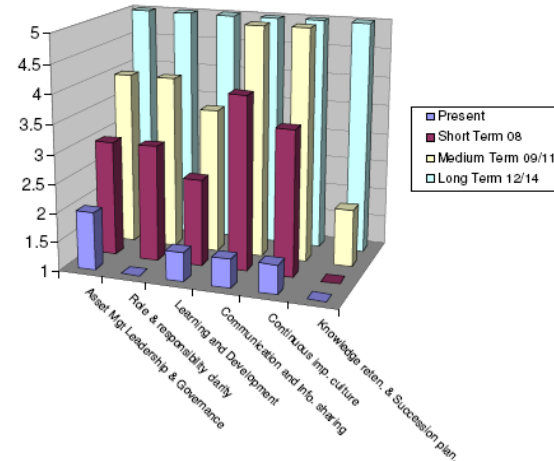
FIGURE 4-1
Asset Man



Figure 4-2 be
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People



Progression in these areas does not necessarily require significant financial resources, but will require time input from a wide range of staff, who will likely be involved with a wide range of other initiatives. However for a fairly small input in this area, there can be significant productivity gains in terms of people better understanding their roles and responsibilities and being given the correct training and information they need to do their jobs more efficiently.

1. Short Term/Early Recommendations

Progress is planned for the majority of the elements in this category. This therefore requires a detailed Improvement Plan to be developed in Q1 2008, to ensure that adequate resources can be assigned and that the 2008 milestones are realistic. Once this plan is developed resources can then be prioritized between this area and the other three areas

- **Asset Management Leadership & Governance** – The mgt team are agreed on a move towards adopting asset mgt tools & techniques, but further governance mechanisms are required to be put in place that will both set and monitor improvement plans across all areas. Resource allocation and progression towards milestones can then be monitored at a senior enough level to ensure that planned activities are progressed within the correct timescales. This may be in the form of a higher level steering group supported by a number of working groups, all with clearly defined Terms of Reference.
- **Roles & Responsibilities** – it is recommended that for asset management activities a RACI assessment is carried out. This takes each major activity and seeks to clarify who is:
 - Responsible
 - Accountable
 - Consulted
 - Informed

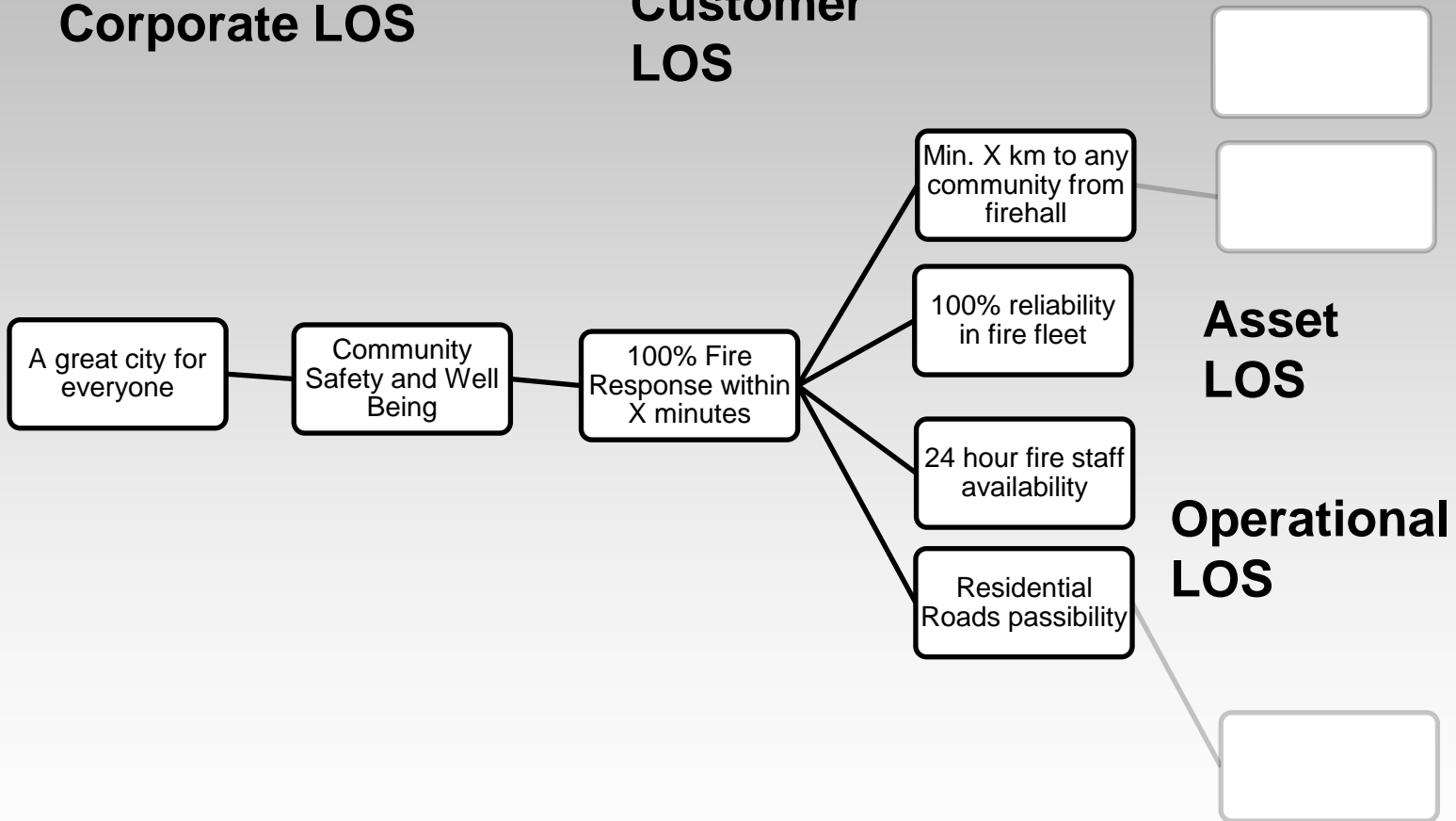


A Key to the AM Plan: Level of Service



Corporate LOS

Customer LOS



*for illustrative purpose only

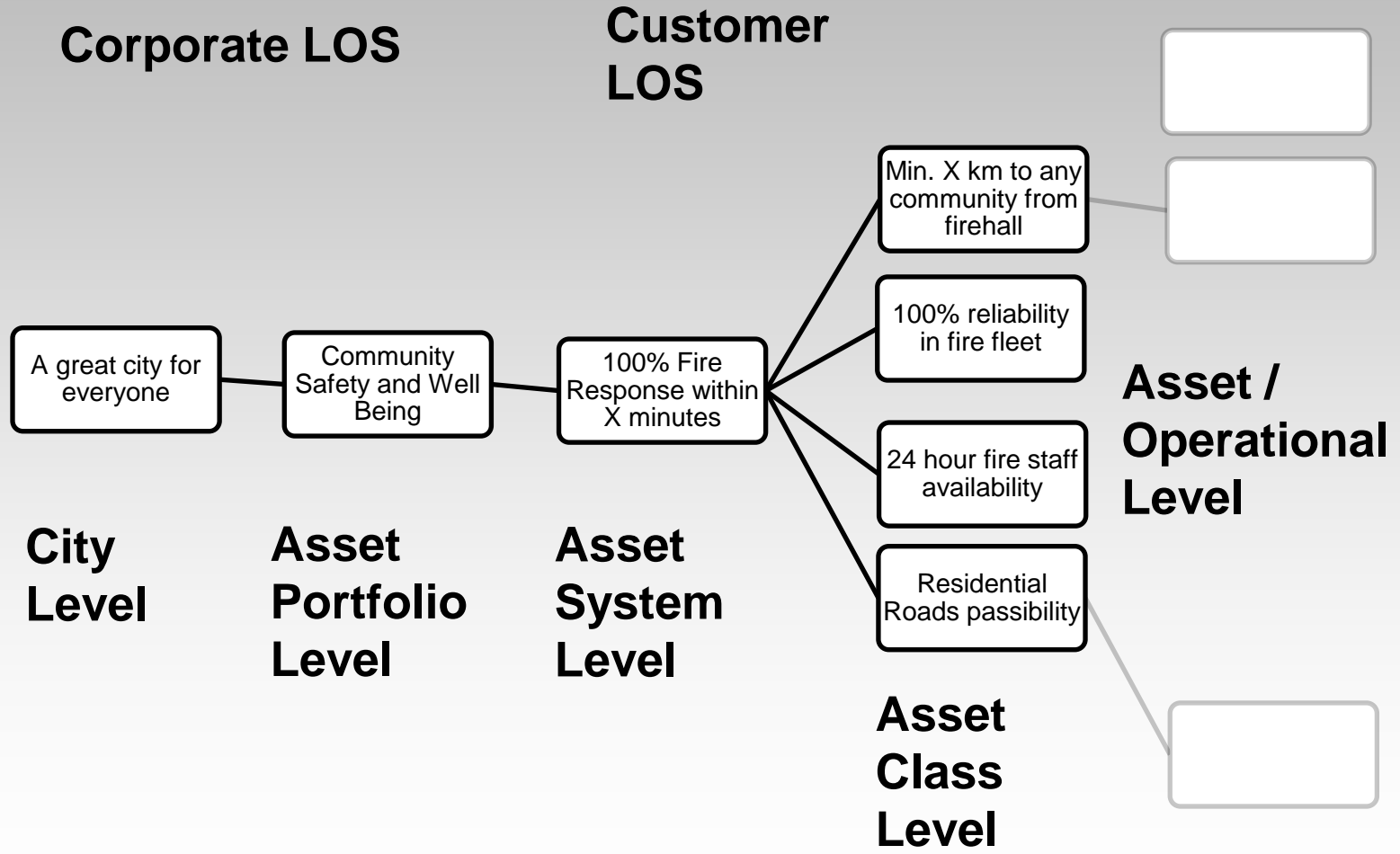


Developing Levels of Service using "Star Rating"

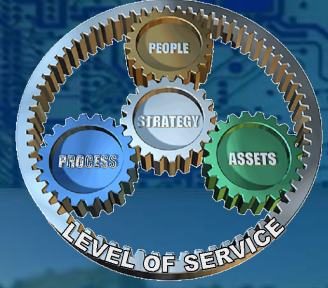




Key Decision: What "level" do you do the analysis - the AM Hierarchy



*for illustrative purpose only



An Incremental Approach to AM Planning

- **Develop Asset Hierarchy, Asset Register Format and Asset Data Attributes**
 - Identify key asset classes and asset types
 - Determine common asset hierarchy
 - Determine mandatory and discretionary “nice to have” data and at what level to assess/analyze at
 - Develop asset Condition and Performance grading
 - Populate a “simple” Asset Register
- **Develop Interim 10 year Opex and Capex Plans**
 - Summarize the forecast expenditure requirements
 - Does not have to use asset lifecycle forecasting
- **Develop Corporate and Customer LOS & Risk Management Framework with current management strategies at the portfolio / Asset system / Asset class level**
 - Modify AM Plans, 10 year Opex and Capex plans, lifecycle model of asset class
- **Develop Corporate and Customer LOS & Risk Management Framework with preferred management strategies**
- **Decide if and when appropriate to take AM Planning to asset level – including asset lifecycle cost modeling, risk and LOS**



Linking AM Planning to Business Planning and Budgeting



AM Plan



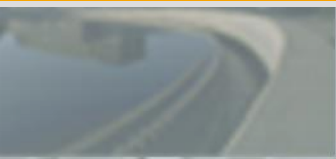
**10 year
Infrastructure
Investment
Plans**



**3 year
Business Plan
& Budget
Plans**



The 10 Year Infrastructure Investment Plan





Questions?



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