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# Urban Forests & Asset Management

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Presentation on the role asset management can play in the sustainable management of our urban forests.

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## Today's Discussion

- Introduction – UF & Accounting
- Accounting practices (definitions)
- Capital assets & their management
- Urban forests: Opinions & attempts
- Other approaches
- What asset management offers UF managers
- Levels of Service & Performance
- Next steps

In this presentation, I will:

- briefly review definitions and examples of asset management and the underlying accounting principles
- discuss International, US and Canadian accounting practices (GASB 34, PSAB 3150) that have prompted interest in urban forest researchers & managers
- illustrate a few attempts at identifying urban forests as capital assets
- discuss other approaches to simulating a capital approach
- most importantly, discuss what UF managers can learn from asset management
- discuss levels of service & performance concepts specific to UF
- and finally, how should we move forward to better understand and use asset management principles.

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## Assets, Capital Assets & Their Management

- **Asset** - ...anything of value owned by a person or company
  - cash
  - buildings
  - patents
  - investments
  - accounts receivable
- **Expense** - ...outflow of asset in exchange for a product or service
  - gas for vehicle

Basic accounting definitions.

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## Assets, Capital Assets & Their Management

- **Capital Asset** - ...an asset held for long-term use in earning a profit;
  - land
  - machinery
- In governmental accounting
  - defined as any asset used in operations with an initial useful life extending beyond one reporting period
  - managers have a "stewardship" duty to maintain capital assets under their control

Basic accounting definitions.

Useful life, life-cycle costs and "stewardship" are all implied or specific concepts when discussing public sector entities (i.e. municipalities).

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## Assets, Capital Assets & Their Management

- **Depreciation** - ...spreading the cost of an asset over a span of years (recovering capital)
- **Maintenance** - ...day-to-day expense needed to use an asset (condition)
- **Capital Improvements** - ...upgrades to capital assets (extend/expand utility)
- **Accrual basis** – considers economic activities of financial events

Basic accounting definitions.

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## Accounting Practices & Standards

- International Standards
  - public entity accrual accounting (as opposed to cash accounting)
  - Making "accounting accountable"

New Zealand and Australia seem to be leading the world in public accountability.

These accounting requirements primarily affect infrastructure assets and their management (by public entities).

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## Accounting Standards

GASB 34 (US)

Bond Ratings/Municipal Funding

Accrual Accounting

PSAB 3150 (CAN)

Asset Management

Accrual Accounting

NAS xx (NZ)

Community Planning

Accrual Accounting

Asset Management

National accounting standards developed to meet International standards. US implementation (2004) emphasized the importance of standard adoption for bond rating. Canadian implementation emphasizes asset management. The New Zealand implementation has a strong community planning process that drives the implementation and use of the standards (LTCCP; Long-Term Council Community Plan).

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## Urban Forestry Attempts to Define Capital Assets

- Why does it matter?
  - Capital assets in the capital budget
    - Allows for capital losses (depreciation, other)
  - Elevates UF to the level of..
    - road & bridges
    - other infrastructure systems

The urban forestry "thinking" (in 2003, US) was that by identifying urban forests as capital assets that funding would be more certain and the status of urban forest management would be elevated.

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## Urban Forests

- Contribute multiple public benefits
  - air quality
  - water quality
  - human health
  - energy (savings)
- Multiple owners
  - public (shared)
  - private
- Non-financial resources
  - i.e. no (rarely) direct income streams

Because urban forests don't generate direct (tangible) income, we usually discuss urban forest "value" in terms of the benefits they provide. These include: air & water quality, shade and resulting energy savings, human health (e.g. reduced skin cancer), and real property appreciation in value.

Public benefits can accrue from both public and privately owned trees (components of the urban forest).

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## Urban Forestry Attempts to Define Capital Assets

- Richmond, VA (US)
  - Street trees
- Warrnambool, VIC (Australia)
  - Street trees
- Audubon Nature Institute (New Orleans, LA)
  - Park trees
- United Kingdom
  - Heritage Assets

Some attempts at classifying trees as capital assets.

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## Urban Forestry - Other Approaches

- Biological Assets (Australia)
  - NPV of expected **cashflow** (income)
- Net Present Value of **benefits** (McPherson)
  - Cumulative life-cycle benefits in today's \$\$
- Biogenic Utility (Hudson, Davey Resource Group)
  - Attempt to generate **income** from either a tax on public benefits, or as direct benefit to another capital asset
    - Shaded pavement - parking lot (Public Works)
    - Forested riparian zone - water quality (Water)

Other approaches to developing asset values for trees and natural resources.

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### UF's Missing Links

Infrastructure status (i.e. the "system")

Depreciation

Measurable service or value

Income (not Benefits)

UK – Heritage Assets (IPSAS 17)

AU – Biological Assets (AASB 141)

AU – Self Generating Assets (AASB 1037)

Urban forestry lacks some basic criteria that could make it easier to define them as capital assets. While "green infrastructure" is a commonly used synonym for urban natural resources (including trees), we seldom "see" the infrastructure "network" or "system" because of the trees obstructing our management view.

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## Urban Forestry's Future

Environmental Service Markets

Carbon

Energy

Water

Biogenic Utility

Taxable services

To capital intensive departments

Directly to citizens

Urban forestry's future as a capital asset lies in the sale of environmental services or Biogenic Utility services.

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## Urban Forest Valuation

Measurable product or service

Tons CO<sub>2</sub>

Avoided energy

Fee based on quantity

Benefits Taxed

Water quality

Shading (pavement protection)

NPV or Negotiated (Interest rate)

To truly “value” urban forests as an asset we need a measurable, saleable product and income. Or, lacking that, we could tax urban forest “clients” for the benefits generated, or charge appropriate “clients” for the output from the Biogenic Utility. With a stream of income over the life of the asset we can calculate current value of the asset by discounting income and expenses (NPV).

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## Urban Forestry

Perceived Benefits of Accounting Standards

- Funding secured when a capital asset
- Public "visibility" of the UF (asset)

Asset Management

- Life Cycle "view"
- Level of service & performance
- Higher level of management

By adopting standards...

Implied and actual asset management criteria.

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## Assets, Capital Assets & Their Management

- **Asset Management** - "...is a methodology to efficiently and equitably allocate resources amongst valid and competing goals and objectives" Danylo and Lemer, 1998

Various asset management definitions.

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## Assets, Capital Assets & Their Management

- **Asset Management** - "...a comprehensive and structured approach to the long-term management of assets as tools for the efficient delivery of community benefits."  
Strategy for Improving Asset Management Practice,  
AUSTROADS

Various asset management definitions.

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## Assets, Capital Assets & Their Management

- **Asset Management** – "...a philosophy and a state of mind, not a process." Asset Management Section, City of Hamilton, ON (CAN)

Various asset management definitions.

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## Capital Asset Management

- **Long-Term, Life Cycle Approach**
- **Level of Service & Performance Standards**
- **Inventory w/Condition**
- **Risk Management (asset loss or interruption of service)**
- **Funding**
  - **Maintenance for condition & service**
  - **Capital improvements based on demand/service**
- **Stewardship**

Asset management summarized for urban forest managers.

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## Assets, Capital Assets & Their Management

- **Infrastructure Assets** - ...capital assets that are
  - part of a system or network
  - may be specialized without alternative uses
  - are immovable
  
- Examples:
  - sewer system
  - utility network

Infrastructure assets are...

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**Urban Forests &  
Asset Management**

**Break**

Prairie Urban Forestry Alliance  
Heritage Park, Calgary, AB



Whew!

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## Capital Asset Management

- **Long-Term, Life Cycle Approach**
- **Level of Service & Performance Standards**
- **Inventory w/Condition**
- **Risk Management (asset loss or interruption of service)**
- **Funding**
  - **Maintenance for condition & service**
  - **Capital improvements based on demand**
- **Stewardship**

A review of asset management for urban forest managers after a long break!.

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## Sustainable Level of Service

- **Technical**
  - **Quality, Quantity**
  - **Reliability**
  - **Availability**
  - **Capacity**
- **Service Quality**
  - **Responsiveness**
  - **Assurance**

Level of service (for infrastructure assets) can be of two basic types. Technical measures of the asset "service" or product, and measures of your ability in managing and providing the asset's "service".

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## Sustainable Level of Service

- **Water**
  - **Continuity of supply – Hours to respond < 3 hours**
  - **Quality – test results comply with applicable federal/provincial/state law**

Examples (Taupo District Council, NZ) of water infrastructure service levels.

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## Sustainable Level of Service

- **Sewer**
  - **Reliability - no more than 2 overflows per 10km of system**
  - **Availability - < 4 hours interruption of service**

Examples (Taupo District Council, NZ) of sewer infrastructure service levels.

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## Sustainable Level of Service

- **Stormwater**
  - **Health/Safety - <5% of properties affected by flooding**
- **Transportation**
  - **Road Quality - % of the network with rutting less than 30mm is greater than 80% of the length**
  - **Safety - reduce crash numbers by 7%**

Examples (Taupo District Council, NZ) of stormwater & transportation infrastructure service levels.

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## Sustainable Level of Service

- **Parks & Reserves**
  - **Accessibility - minimum of 7 Hectares of reserve per 1000 population**
  - **Reliability - complaints relating to parks and reserves are responded to within 5 working days.**

Examples (Taupo District Council, NZ) of parks infrastructure service levels.

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## Urban Forestry Assets

- . Criteria (Core Value)
  - . Quality
  - . Quantity
- . Level of Service
  - . Condition
  - . Number
- . Performance

Service levels for urban forests...

basic core value (see Taupo District Council)

measured level of service

rate the attainment of the service (i.e. how well are you performing)

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## UF Asset Criteria

**Level of Service**  
Canopy coverage – city-wide average 50%

**Performance**  
Canopy health  
e.g. 80% leaves pest free; photosynthetic capacity measurement  
Canopy density achieved

Some “draft” urban forest service levels and performance measures.

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## UF Asset Criteria

**Performance**

- Utility interruptions – maximum tree-related outages**  
e.g. 10k Household Hours/year
- Transportation interruptions – maximum tree-related**  
e.g. Vehicles/1k/year (based on time and traffic counts)
- Shade – shade days (measurement complex;  
extent & density of shade)**  
e.g. Summer Equinox, Noon – 1.5 SqMi (50% of city)  
shaded at 75% opacity  
e.g. 80% of parking lot surface shaded at 75% opacity

Some “draft” urban forest service levels and performance measures.

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## Urban Forestry's Future

### **Alliances – Acct Standards & Practices**

**APWA**

**SMA**

**Asset Managers**

**Other “green” managers - NZ, AU, UK**

### **Infrastructure**

**Services & Value**

### **Biogenic Utility**

**Services, Value, and Reimbursement**

Urban foresters moving forward with...

- ❑ Asset management
- ❑ Accrual accounting & capital assets
  
- ❑ Alliances of “grey & green” managers.
- ❑ Making urban forest management more like infrastructure asset management.
- ❑ Generate income!

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## References

- **American Public Works Association (APWA)**
  - <http://www.apwa.net>
- **InfraGuide –**
  - <http://sustainablecommunities.fcm.ca/Home/>
- **International Federation of Accountants (IFAC)**
  - <http://www.ifac.org>
- **International Public Sector Accounting Standards Board (IPSASB)**
  - <http://www.ifac.org/PublicSector/>
- **Making accounting accountable in the public sector, Carnegie, Garry D., and Brian P. West, Critical Perspectives on Accounting 16 (2005) 905-928, 2005, Elsevier Ltd.**
- **Strategic Municipal Asset Management, Worley International, Ltd., April 2000**
- **Taupo District Council, NZ**
  - <http://www.taupodc.govt.nz>

References for this discussion include...

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## **Change of Viewpoint**

...from one where we  
“can’t see the forest for the trees”

...to a view of  
the green infrastructure “system”

2009, the year of “change”.

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At [www.UrbanForestrySouth.org](http://www.UrbanForestrySouth.org), a 'Quick Search' for GASB, PSAB, or prairie will locate this presentation for download and other resources that may be useful.

Visit the Prairie Urban Forestry Alliance's (PUFA) website.