MFOA/AMCTO FALL SEMINAR SERIES

TANGIBLE CAPITAL ASSETS ACCOUNTING

TOPIC:
VALUATION OF ROADS AND OTHER NETWORKS

Presented By:

Joe Lombardo, ASA

Regional Vice President

Suncorp Valuations Ltd.

Overview of Presentation

- Division of Linear Assets
- Sub-Classification of Linear Assets
- Valuation Approaches for Linear Assets
- Valuation of Roads and Associated Assets
- Valuation of Sewer System
- Valuation of Water Distribution System
- Linear TCA Replacements/Upgrades
- Amortization of Linear Assets
- Example of Useful Life Schedule

Why Componentize Linear Assets?

- Represent most significant value of municipality's TCA holdings
- Pooling diminishes ability to identify, control and manage assets
- Assets must be recorded by approximate In-Service Date
- Linear Assets are distinctively different
- Easier to remove deletions/retirements from record
- Will facilitate implementation of Asset Management Program

Sub-Classification of Linear Assets

Sub-Class	Assets Included
Roads	➢Arterial ➢Collector ➢Local — Includes Boulevard, Curbs and Gutters, Road Subsurface and Surface
Sidewalks	➢Concrete ➢Brick
Street Lighting	➢Poles ➢Lights (Luminaires)

Sub-Classification of Linear Assets

Sub-Class	Assets Included
Water Distribution	➢Water Mains (including valves and fittings) ➢Fire Hydrants ➢Water Meters ➢Water Towers
Waste Collection	➢Storm Sewers ➢Sanitary Sewers ➢Manholes ➢Catchbasins

Valuation Approaches For Linear Assets

- If Historical Records are available, utilize Historical Cost
- If Historical Records are not available, employ Discounted CRN or RCN

Step 1 Develop Benchmark CRN/RCN Unit Costs for each Linear Asset type

Step 2 Apply Benchmark CRN/RCN Unit Costs to inventory quantities

Step 3 Develop Deflation Factors for Linear Asset Sub-Classes

Step 4 Apply Deflation Factor to CRN/RCN to discount back to In-Service Date

VALUATION OF ROADS AND ASSOCIATED ASSETS

Suggestions for Inventory Phase

- Classify Roads by category (width)
- Subdivide inventory by Road Surface Type and Soil Condition
- Determine if Road Assets to be recorded as one entry or segregated by subsurface and surface components
- Subdivide inventory entries by Vintage
- Consider categorizing inventory by Area/Region
- Ensure intersections are not duplicated

Road Valuation Example

Valuation Method – Discounted Cost of Reproduction New

Assume that the Roads have been inventoried by Geographic Area, Vintage, Type, Soil Condition and Road Surface. The inventory data below is meant to represent the Assets in one Geographic Area.

In Service Date	Soil Condition	Road Type	Road Surface	Total Length
1995	Sand	Local Road, 8.5m width, c/w Curbs & Gutters	Asphalt	10km
1985	Clay	Collector Road, 9.14m width c/w Curbs & Gutters	Asphalt	12km
1990	Clay	Arterial Road, 13.5m width, c/w Curbs & Gutters	Asphalt	15km
1980	Rock	Arterial Road, 13.5m width, c/w Curbs & Gutters	Asphalt	5km
1990	Clay	Sidewalk, 1.524m width	Concrete	5km

Road Valuation Example

Step 1

Establish current CRN per lineal meter/square meter for each Type of Road by Soil Condition and Road Surface

Road Type	Soil Condition	Road Surface	Unit Cost
Local (8.5m)	Sand	Asphalt	$800/m
Collector (9.14m)	Clay	Asphalt	$1,200/m
Arterial (13.5m)	Clay	Asphalt	$1,600/m
Arterial (13.5m)	Rock	Asphalt	$2,500/m
Sidewalk (1.524m)	Clay	Concrete	$60/sq. m

Road Valuation Example

Step 2

Calculate CRN of each Asset entry by multiplying Unit Cost by Total Length

Description	Soil Condition	Road Surface	Unit Cost	Total Length	CRN
Local (8.5m)	Sand	Asphalt	$800/m	10km	$8,000,000
Collector (9.14m)	Clay	Asphalt	$1,200/m	12km	$14,400,000
Arterial (13.5m)	Clay	Asphalt	$1,600/m	15km	$24,000,000
Arterial (13.5m)	Rock	Asphalt	$2,500/m	5km	$12,500,000
Sidewalk (1.524m)	Clay	Concrete	$60/sq. m	5km	$457,200

Road Valuation Example

Step 3 **Discount CRN for deflation back to In-Service Date**

Description	In Service Date	Total Length	CRN	Deflation Factor	Estimated Original Cost
Local Road, 8.5 Meters width, c/w Curbs & Gutters	1995	10km	$8,000,000	.628	$5,024,000
Collector Road, 9.14m width c/w Curbs& Gutters	1985	12km	$14,400,000	.484	$6,969,600
Arterial Road, 13.5m width, c/w Curbs & Gutters	1990	15km	$24,000,000	.557	$13,368,000
Arterial Road, 13.5m width, c/w Curbs & Gutters	1980	5km	$12,500,000	.391	$4,887,500
Sidewalk, 1.524m width	1990	5km	$457,200	.557	$254,660

VALUATION OF SEWER SYSTEM

Suggestions for Inventory Phase

Underground Pipe Systems

- Classify Sewer Pipe by Type (Sanitary, Storm, Combination)
- Segregate inventory by Construction Material and Size
- Sub-divide inventory entries by Vintage
- Consider categorizing inventory by Area/Region

Associated Ancillary Assets

- Inventory counts by Vintage and Depth for:
  - Catch-Basins
  - Manholes

WASTE TREATMENT PLANTS ARE NOT LINEAR ASSETS

Sewer System Valuation Example

Valuation Method – Discounted Replacement Cost New

Assume that the Sewer System has been inventoried by Geographic Area, Type, Construction Material and Size/Depth. The inventory below is meant to represent the Assets in one Geographic Area.

Type	In-Service Date	Description	Size	Material	Total Length or Units
Sanitary	1993	Underground Pipe c/w Fittings and Valves	15”dia.	PVC	3 miles
Sanitary	1985	Underground Pipe c/w Fittings and Valves	18” dia.	Concrete	8 miles
Storm	1960	Underground Pipe c/w Fittings and Valves	24” dia.	Cast Iron	5 miles
Storm & Sanitary	1970	Manholes	48” dia, 15’ deep	Steel & Concrete	200 units
Storm	1970	Catchbasins	4’ deep	Steel& Concrete	300 units

Sewer System Valuation Example

Step 1

Establish RCN per Lineal Foot for each Size and Construction Type of Underground Pipe as well as typical unit of Ancillary Assets.

Description	Size	Material	Cost Per Lineal Foot or Unit
Underground Pipe c/w Fittings and Valves	15”dia.	PVC	$100/l.ft.
Underground Pipe c/w Fittings and Valves	18” dia.	Concrete	$150/l.ft.
Underground Pipe c/w Fittings and Valves	24” dia.	Cast Iron	$180/l.ft
Manholes	48” dia, 15’ deep	Steel& Concrete	$8000/unit
Catchbasins	4’ deep	Steel & Concrete	$2,000/unit

Sewer System Valuation Example

Step 2

Calculate RCN of each Asset entry by multiplying Unit Cost by Total Length or Units.

Description	Size	Material	Cost Per Lineal Foot or Unit	Total Length or Units	Total RCN
Underground Pipe c/w Fittings and Valves	15”dia.	PVC	$100/l.ft.	15,840 ft.	$1,584,000
Underground Pipe c/w Fittings and Valves	18” dia.	Concrete	$150/l.ft.	42,240 ft.	$6,336,000
Underground Pipe c/w Fittings and Valves	24” dia.	Cast Iron	$180/l.ft	26,400 ft.	$4,752,000
Manholes	48” dia, 15’ deep	Steel & Concrete	$8,000/unit	200 units	$1,600,000
Catchbasins	4’ deep	Steel & Concrete	$2,000/unit	300 units	$600,000

Sewer System Valuation Example

Step 3 **Discount RCN for Deflation to In-Service Date**

Description	In Service Date	Total Length or Units	RCN	Deflation Factor	Estimated Original Cost
Underground Pipe c/w Fittings and Valves	1993	15,840 ft.	$1,584,000	.593	$939,312
Underground Pipe c/w Fittings and Valves	1985	42,240 ft.	$6,336,000	.490	$3,104,640
Underground Pipe c/w Fittings and Valves	1960	26,400 ft.	$4,752,000	.124	$589,248
Manholes	1975	200 units	$1,600,000	.293	$468,800
Catchbasins	1975	300 units	$600,000	.293	$175,800

VALUATION OF WATER DISTRIBUTION SYSTEM

Suggestions for Inventory Phase

Water Mains

- Follow same guidelines as Sewer Network

Associated Ancillary Assets

- Gate Valves – Inventory by Size and Vintage
- Fire Hydrants – Inventory by Vintage
- Water Meters – Inventory by Type/Size and Vintage
- Water Towers – Inventory individually noting Type & Capacity

WATER TREATMENT PLANTS ARE NOT LINEAR ASSETS

Water Distribution System Example

Valuation Method – Discounted Replacement Cost New

Assume that the Water Distribution System has been inventoried by Geographic Area, Type, Construction Material and Size. The inventory below is meant to represent the Assets in one Geographic Area.

In-Service Date	Description	Size	Material	Total Length or Units
1995	Water Main	12” dia	PVC	1,800m
1985	Water Main	20” dia	Concrete	500m
1985	Gatevalves	12” dia	Steel	50 units
1970	Fire Hydrants c/w Valves	Standard	Steel	50 units
1970	Elevated Water Tower 75’ Height	200,000 gallons	Steel	200,000 gallons
1990	Water Meters	5/8”	---	500 units

Water Distribution System Example

Step 1

Establish RCN per Lineal Foot for each Size and Construction Type of Water Main as well as typical unit of Ancillary Assets.

Description	Size	Material	Cost Per Lineal Metre or Unit
Water Main	12” dia	PVC	$300/l.m
Water Main	20” dia	Concrete	$1,000/l.m
Gatevalves	12” dia	Steel	$3,000/unit
Fire Hydrants c/w Valves	Standard	Steel	$5,500/unit
Elevated Water Tower 75’ Height	200,000 gallons	Steel	$3/ gallon
Water Meters	5/8”	---	$100/ unit

Water Distribution System Example

Step 2

Calculate RCN of each Asset entry by multiplying Unit Cost by Total Length or Units.

Description	Size	Material	Cost Per Lineal Meter or Unit	Total Length or Units	Total RCN
Water Main	12” dia	PVC	$300/l.m	1,800m	$540,000
Water Main	20” dia	Concrete	$1,000/l.m	500m	$500,000
Gatevalves	12” dia	Steel	$3,000/unit	50 units	$150,000
Fire Hydrants c/w Valves	Standard	Steel	$5,500/unit	50 units	$275,000
Elevated Water Tower 75’ Height	200,000 gallons	Steel	$3/ gallon	200,000 gallons	$600,000
Water Meters	5/8”	---	$100/ unit	500 units	$50,000

Water Distribution System Example

Step 3 **Discount RCN for Deflation to In-Service Date**

Description	In Service Date	Total Length or Units	RCN	Deflation Factor	Estimated Original Cost
Water Main	1995	1,800m	$540,000	.628	$339,120
Water Main	1985	500m	$500,000	.484	$242,000
Gatevalves	1985	50 units	$150,000	.578	$86,700
Fire Hydrants c/w Valves	1970	50 units	$275,000	.578	$158,950
Elevated Water Tower 75' Height	1970	200,000 gallons	$600,000	.225	$135,000
Water Meters	1990	500 units	$50,000	.575	$28,750

Linear TCA Replacements/Betterments

- **Establish Capitalization Thresholds for each Sub-Class of Linear Assets**

Does Replacement expenditure meet Capitalization Threshold?

No
- Expense

Yes
- Record as Capital Asset
- Delete replaced Asset from record

Does Linear Asset Betterment reduce operating costs, increase capacity or extend Useful Life?

No
- Expense

Yes
- Capitalize

TCA Replacements/Betterments entries should be identified as associated to applicable Linear Asset via a suffix Asset Number.

Amortization of Linear Assets

- Straight-Line Approach is most appropriate
- Develop Useful Life Schedule for each type of Linear Assets:
  - Published Data
  - Historical Experience
- For grouped entries use averaging to assign Useful Life
- Consider Extended Useful Life for transition period Assets

Example of Useful Life Schedule

Linear Asset Type	Useful Life (Years)
Water Main – Concrete	60
Water Main – Metal	50
Water Main – PVC	55
Fire Hydrants	40
Water Tower	50
Sewers – Concrete	60
Sewers – Brick	90
Sewers – Metal	50
Sewers – PVC	55
Sewers – Wood	50
Sanitary Manholes	50
Catchbasins	40
Valves and Chambers	40
Road - Base	60

Linear Asset Type	Useful Life (Years)
Road – Dirt	10
Road – Gravel	15
Road – Asphalt	20
Road – Concrete	30
Road – Brick or Stone	40
Sidewalk – Asphalt	20
Sidewalk – Concrete	30
Sidewalk – Brick or Stone	40
Street Lighting – Pole Concrete	35
Street Lighting – Pole Metal	30
Street Lighting – Pole Wood	25
Street Lighting – Luminaire	15
Street Lighting – (HPS)	5

Valuation:
Roads and Other Networks

Presented by:

Calvin Hawke CA
TCA Consulting Limited

Valuation:
Roads and Other Networks

1. Defining the Asset
2. Threshold
3. Sustainable Assets
4. Individual Segments – Aggregating Segments

Valuation:
Roads and Other Networks

5. Historical Cost – Where Available

6. Deflated Replacement or Reproduction Cost – used in the Majority of Cases

7. CPI – is it Good Enough

8. Include all Costs – Gross not Net Amount

Valuation:
Roads and Other Networks

9. Direct Costs & Indirect Costs

10. Jointly Funded

11. Straight Line Amortization – is it Good Enough?

12. Confirm approach with your Auditor