Class 504 Workshop-Webinar Version

Sponsored by:
Massachusetts Department of Revenue's Division of Local Services
Bureau of Local Assessment
&
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Class 504 Utility Property Valuation

Change in Valuation Methodology Based on Case Law

The most recent decision with findings of the Appellate Tax Board in *NStar Electric Company v. Board of Assessors of the City of Boston, ATB 2017-340*, relies on the earlier holdings and findings of the *Boston Gas v. Boston*(1) case to affirm the opinion that the continued "existence of special circumstances" allowed, "for the purposes of property tax valuation, 'the use of a valuation method other than (or in addition to) net book value [was justified]'."

(1) Boston Gas Company v. Board of Assessors of Boston, 458 Mass. 722 (2011) [*Supreme Judicial Court*]

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MA Department of Revenue Division of Local Services
Local Finance Opinion LFO-2019-1
https://www.mass.gov/doc/assessing-utility-properties/download
March 26, 2019

***Issue*:** Evolving Court Decisions Affecting Determination of Fair Cash Value of Utility Properties

***Issued by*:** Bureau of Municipal Finance Law

Summary*:** "Both the ***Boston Gas and the ***NSTAR*** cases demonstrate that the ATB and the appellate courts have accepted that the DPU's carry-over rate base rule has changed over the years and that this change is a 'special circumstance' warranting deviation from the net book value approach."

***Outcome*:** Introduction of new state tax forms (FOL's) for Class 504 properties (optional for FY2021).

https://www.mass.gov/doc/gas-state-tax-form-of-list-2-504-g/download
https://www.mass.gov/doc/electric-state-tax-form-of-list-2-504-e/download

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Fair Market Value

The basis for fair market value for assessment purposes in Massachusetts has been defined as,

"*the price an owner willing but not under any compulsion to sell ought to receive from one willing but not under compulsion to buy.*" "*The fair cash value is the value this property would have had on January 1 of any taxable year in the hands of any owner, including the present owner.*"

– *Boston Gas Company v. Board of Assessors of Boston*, 334 Mass. 566 (1956) [*Supreme Judicial Court*]

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What Market Events Lead to These Changes?

- On November 8, 2000 KeySpan Corporation acquired Eastern Enterprises for a reported $1.7 billion. Eastern's natural gas distribution subsidiaries included Boston Gas Company, Colonial Gas Company (acquired in 1999) and Essex Gas Company.
- In February 2006, National Grid USA, a wholly owned subsidiary of National Grid plc of the United Kingdom, announced that it had agreed to buy KeySpan for $7.3 billion in cash (completed in August 2007).
- National Grid also announced the acquisition of New England Gas Company, a Rhode Island subsidiary of Southern Union Company, creating the second largest utility in the United States with more than 8 million customers (natural gas & electric power).

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ATB Adopted Valuation Methodology
50% NBV & 50% RCNLD

Taxpayer Calculates:

Reported Net Book Value

1. Original Cost (Installed)
2. Less "Accrued" Depreciation up to 100%
3. Plus or Minus Salvage Costs (Usually Negative)
4. Equals Net Book Cost reported as Net Book Value (NBV) [Rate Base]

Assessor Calculates:

RCNLD (PD&FO)

1. Reproduction Cost
    1. Less Excess Capital Cost
2. Replacement Cost
3. Less Physical Depreciation
4. Less Incurable Functional Obsolescence
5. Equals RCNLPD&FO

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The Cost Approach & Obsolescence

American Society of Appraisers' (ASA)
Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, 3rd edition

"Although replacement cost is the proper starting point in the cost approach, this does not preclude development of reproduction cost for some purposes. Reproduction cost can be developed to quantify one form of functional obsolescence that due to *excess capital cost*."

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Reproduction Cost vs. Replacement Cost

Natural Gas Distribution Companies' Annual Reports to the MA-DPU include a description of the entire system Mains by type & size (diameter), which can be used to calculate both reproduction cost & replacement cost new by substituting exiting older materials with a hypothetical new material, i.e. steel or plastic versus cast iron in order to measure curable functional obsolescence as a percentage due to excess capital cost that can then be applied to a reproduction cost of a segment of the system using a reported original cost from a FOL Return to a municipal assessor. Detailed segment descriptions are not typically reported and are assumed to be representative of the system-wide Mains.

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Reproduction Cost vs. Replacement Cost

Boston Gas Company system-wide at 12/31/2018
Using **Boston Gas Co.** Annual Report to MA DPU*
& Marshall Swift 1/1/2019 RCN Tables
[FERC Account #367 Only – Gas Mains]

Reproduction Cost New	$2,458,790,498
Replacement Cost New	$2,075,079,820
Excess Capital Costs	$383,710,677
Functional Obsolescence	**15.6%**
Due to Excess Capital Cost	of Reproduction Cost

*https://www.mass.gov/info-details/find-a-natural-gas-company-annual-return

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Reproduction Cost vs. Replacement Cost

Berkshire Gas Company system-wide at 12/31/2018
Using **Berkshire Gas Co.** Annual Report to MA DPU*
& Marshall Swift 1/1/2019 RCN Tables
[FERC Account #367 Only – Gas Mains]

Reproduction Cost New	$183,350,665
Replacement Cost New	$119,927,606
Excess Capital Costs	$63,423,060
Functional Obsolescence	**34.6%**
Due to Excess Capital Cost	of Reproduction Cost

*https://www.mass.gov/info-details/find-a-natural-gas-company-annual-return

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Questions on Methodology?

- ATB & SJC Decisions & Findings
  - Boston Gas Co.
  - NStar Electric
- Cost Approach Only
- NBV \ RCNLD
- Gas Companies' Annual Reports-DPU
- System-wide data
- Reproduction Cost vs. Replacement Cost

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Calculating Reproduction Cost New

- In the Boston Gas v. City of Boston Assessors case, the ATB accepted the use of the Handy-Whitman Index (HWI) to factor the reported Original Cost to an estimate of Reproduction Cost New.
- For each utility account (FERC*) category, the reported original cost of the property for each vintage year was multiplied by the HWI factor that corresponds to the FERC Code and Vintage Year for that account to determine the Current Cost, or the cost to reproduce that exact property as of January 1.

* Federal Energy Regulatory Commission

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Calculating Reproduction Cost New Using Original Cost and the Handy-Whitman Index

- Example: For 1/1/2019 Assessment Date
  - Gas Mains installed in year 2000 for $500,000
  - Gas Services installed in year 2005 for $250,000
  - Gas Meters installed in year 2010 for $100,000

FERC Code	Description	Year	Original Cost	HWI Year	HWI 2018	HWI Factor	RCN at 1/1/2019
367.0	Mains Mixed Steel-Cast Iron-Plastic	2000	$500,000	322	677.5	2.10	$1,050,000
380.0	Services	2005	$250,000	492	758.3	1.54	$385,000
381.0	Meters	2010	$100,000	253	485	1.92	$192,000
	TOTALS		**$850,000**				**$1,627,000**

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Demonstration Case Study (Example Only):

Valuation of a Natural Gas Distribution System within Municipality **'A'** using reported FOL* Original Costs by year and Reproduction Cost New using the Handy-Whitman Index (HWI).

FERC ACC. NO	ACCOUNT NAME	ORIGINAL COST	RCN by HWI
367.0	MAINS–STEEL-PLASTIC-CAST IRON	$8,544,711	$37,110,605
380.0	GAS SERVICES-MIXED [Main>>Meter]	9,527,533	16,698,053
381.0	GAS METERS	1,057,928	1,398,417
TOTALS		**$19,130,172**	**$55,207,075**

*Use G.L. 59:38F Letter if needed to collect cost detail by FERC/Year
https://www.mass.gov/doc/template-for-electric-distribution-transmission-company-for-additional-information/download

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Demonstration Case Study (Example Only):

Valuation of a Natural Gas Distribution System within Municipality **'A'** using reported **System-wide Mains data** and Marshall & Swift Cost Tables (Section 62 & Section 99).

Functional Curable Obsolescence; Excess Capital Costs (XCC):

Using System-wide Mains descriptions from DPU Annual Report

Reproduction Cost, Mains:	$1,000,688,656
Replacement Cost, Mains:	$791,428,278
Excess Capital Cost:	$209,260,378
Curable Functional Obsolescence %	**20.9%**

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Demonstration Case Study:

Valuation of a Natural Gas Distribution System within Municipality **'A'** using reported (FOL) Original Costs by year.

Reproduction Cost & Replacement Cost:

FERC ACC.	ACCOUNT NAME	Reproduction Cost New	Reproduction Cost – XCC = Replacement Cost New
367.0	MAINS–STEEL-PLASTIC -CAST IRON	$37,110,605	$29,350,778
380.0	GAS SERVICES-MIXED	16,698,053	16,698,053
381.0	GAS METERS	1,398,417	1,398,417
TOTALS		**$55,207,075**	**$47,447,248**

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Questions on Calculating Reproduction Cost & Replacement Cost?

- Original Cost by
  - FERC Account &
  - Vintage Year
- Handy-Whitman Index & Cost Factors
- Reproduction Cost of FOL Reported Assets
- Reproduction Cost of system-wide Mains
- Replacement Cost of Mains by M&S
- Excess Capital Cost

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Physical Depreciation: Age-Life Formula

Current Year (-) Vintage Year = Asset Age

Asset Age (/) Depreciation Life = % Depreciation

(ATB allowed 80% Maximum Depreciation)

% Depreciation (x) RCN*= Physical Dep.Amount

RCN (-) Depreciation Amount = RCNLPD

*Replacement Cost New

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Physical Depreciation/ Residual Percent Good

The DOR's mandatory training course for all assessors; *Assessment Administration: Law, Procedures and Valuation (On-line)*, states in Chapter 8, Personal Property depreciation; "Depreciation must be based on age, condition and quality of the property. Property still in use has a utility value, even if its life expectancy has been exceeded and it has zero value for accounting or regulatory purposes. Generally, property in use should not be depreciated below 20 percent, although depreciation to as low as five percent might be appropriate where economic obsolescence principles apply. Assessors must document depreciation allowances".

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Gas Company Chart of Accounts & Annual Depreciation Rates

FERC Code	Account Name	Service Life (years)	Annual % Depreciation
367.12	Mains-Steel-Plastic- Cast Iron Mixed	70	1.43
369.00	Measuring & Regulating Station Equip	50	2.00
380.04	Gas Services Mixed	43	2.33
381.00	Meters	34	2.94
381.01	Gas Meters Instrument	34	2.94
381.02	Gas Meters ERTS (smart meter)	14	7.14
381.03	Gas Meters LMUS (regular flow meter)	14	7.14
382.01	Gas Meters Protection Equipment	34	2.94
382.02	Gas Meters Installations	34	2.94

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Demonstration Case Study:

Valuation of a Natural Gas Distribution System within Municipality **'A'** using reported (FOL) Original Costs by year.

Replacement Cost New Less Physical Depreciation (RCNLPD):

FERC ACC.	ACCOUNT NAME	Replacement Cost New	RCNLPD
367.0	MAINS–STEEL-PLASTIC-CAST IRON	$29,350,778	$11,239,981
380.0	GAS SERVICES-MIXED	16,698,053	9,641,992
381.0	GAS METERS	1,398,417	712,725
TOTALS		**$47,447,248**	**$21,594,698**

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Incurable Functional Obsolescence

American Society of Appraisers' (ASA)
Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, 3rd edition

Property currently in use may also suffer from obsolescence due to excess operating or maintenance costs.

ASA defines operating obsolescence as, "the present value of the future excess operating expenses".

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Incurable Functional Obsolescence

- Cost inefficiencies created by the older cast-iron piping result in excess operating costs and/or excess maintenance costs.
- The amount of the excess cost above the cost to operate or maintain newer piping is a loss in revenue that can be capitalized into value loss from replacement cost new (depreciation).
- An income approach technique is used in the cost approach to solve the valuation problem.

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Incurable Functional Obsolescence due to Excess Operating Costs - Analysis: Boston Gas Co. 5-year average; based on actual data. Result: 4.11% of RCNLPD

ANALYSIS OF EXCESS OPERATING COSTS **FOR FISCAL YEAR 2020**

For Boston Gas Company (system wide)	2018	2017	2016	2015	2014	5-Year Average
Total T&D Operation Expenses	$ 255,507,692	$ 43,875,978	$ 46,670,558	$ 40,442,813	$ 61,996,679	$ 89,698,744
Total Expenses from account # 874 Operation of Mains	65,018,299	22,139,665	15,318,079	17,011,400	34,157,948	$ 30,729,078
Percent or Total System Operating Expense of Main Operations	25.45%	50.46%	32.82%	42.06%	55.10%	41.18%
Industry Average Expense Ratio of Main Operations [GTI Study (1)]	20.80%	20.80%	20.80%	20.80%	20.80%	20.80%
Excess Cost of Boston Gas system, main operations (BGC % - GTI %)	4.65%	29.66%	12.02%	21.26%	34.30%	20.38%
Excess Cost of Boston Gas system, main operations (BGC% - GTI%) x total T&D operations)	(11,872,699)	(13,013,462)	(5,610,603)	(8,599,295)	(21,262,639)	(12,071,739)
Excess main operations cost adjusted for income tax rate of 40% (<2017) & 21% in 2018	(9,379,432)	(10,280,635)	(3,366,362)	(5,159,577)	(12,757,583)	(8,188,718)
Indicated Discount Rate: present value factor for 20 years at 8.0%.	9.82	9.82	9.82	9.82	9.82	9.82
Indicated Present Value of Income Loss due to Main Operating Expenses	$ 92,088,649	$ 100,936,786	$ 33,051,436	$ 50,657,487	$ 125,255,833	$ 80,398,038
Replacement Cost; RCN [2]: Mains	$ 2,075,079,820	$ 2,012,224,576	$ 1,943,089,852	$ 1,898,358,102	$ 1,868,264,283	$ 1,959,403,327
% Loss in Value (Obs.) to RCN	**4.44%**	**5.02%**	**1.70%**	**2.67%**	**6.70%**	**4.11%**

[1] Gas Technology Institute, "Gas Distribution Industry Survey: Cost of Installation, Maintenance and Repair Operations"

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Economic Obsolescence: ATB Findings/Report

Boston Gas Company d/b/a KeySpan Energy Delivery New England v. City of Boston Assessors – April 21, 2011

"Moreover, the economic obsolescence associated with the property's highly regulated earnings is taken into account by blending the subject property's net book value with the value derived from the RCNLD approach." ATB 2011-273

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Economic Obsolescence: Regulatory Factors

Arlo Woolery, CAE, former Executive Director of the Lincoln Institute of Land Policy, Cambridge, Mass.

Valuation of Railroad and Utility Property (1992) page 44

"The regulatory process is regarded by many appraisers as the principal source of economic obsolescence.

The loss in value is generally ascribed to three main items.

- Failure to allow an adequate rate base
- Failure to allow an adequate rate of return
- Failure to allow an adequate recovery of costs"

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Questions on Calculating Depreciation?

- Excess Capital Costs
- Physical Depreciation
  - Service Lives
  - Residual % Good
- Incurable Functional Obsolescence
- Economic Obsolescence
- Regulatory Factors
- Required Understanding of the Tools for Measuring Depreciation

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Summary of RCNLD & NBV Valuation

1. Original Reported Cost x HWI =
2. Reproduction Cost
   - Less Excess Capital Cost (if any) =
3. Replacement Cost
   - Less Physical Depreciation =
4. Replacement Cost Less Physical Depreciation
   - Less Incurable Functional Obsolescence (if any) =
5. Replacement Cost Less Phys. Dep.& Funct. Obsolescence
6. **RCNLPD&FO + NBV / 2 = Fair Market Value**

Note: 50/50 Blended Value includes Economic Obsolescence

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Is the Cost Model for Electric Utilities the same as for Gas Distribution systems?

- The basic Cost Model structure is the same.
- In the NStar v. Boston Assessors ATB case (2017), both experts concluded that functional obsolescence was not present in the electric transmission or distribution system valued.
- Without the presence of measurable functional obsolescence, reproduction cost and replacement cost are considered equal.

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Incurable Functional Obsolescence

American Society of Appraisers' (ASA)
Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, 3rd edition

ASA defines functional obsolescence as "the loss in value or usefulness of a property caused by inefficiencies or inadequacies of the property itself, when compared to a more efficient or less costly replacement property that new technology has developed. Symptoms suggesting the presence of functional obsolescence are excess operating cost, excess construction (excess capital cost), over-capacity, inadequacy, lack of utility, or similar conditions" [page 70].

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Incurable Functional Obsolescence

The *Producer Price Index* tracks the average change in prices over time of domestically produced and consumed commodities. The PPI is published by the Bureau of Labor Statistics (BLS) of the U.S. Department Labor. The PPI measures real growth in output and price changes in producer's durable equipment. The index for power distribution equipment indicates an overall increase in the price of power distribution equipment of 18% over the period of 2008 through 2018, or an average increase of 1.8% per year.

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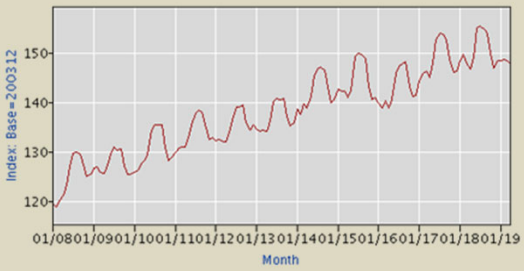
Incurable Functional Obsolescence

The graph below shows the PPI for Electric Power Distribution from 2008 through 2018, using 1/2004 as 100. Producer Price Index - PCU221122 Electric Power Distribution

Source:(http://data.bls.gov/timeseries/PCU221122221122)



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What Creates Value?

U.S. Supreme Court says …

"Will it be said that the taxation must be based simply on the cost, when never was it held that the cost of a thing is the test of its value."

"The value of property results from the use to which it is put and varies with the profitableness of that use, present and prospective, actual and anticipated. There is no pecuniary (monetary) value outside that which results from such use". *Cleveland, C.C. and St. Louis Ry. Co. v. Backus, 154 U.S. 445 (1894)*

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Cleveland C. Railway Co. v. Backus, 154 U.S. 439, (1894) "Where an assessing board is charged with the duty of valuing a certain number of miles of railroad within a State forming part of a line of railroad running into another State, and assesses those miles of railroad at their actual cash value determined on a mileage basis, this does not place a burden upon interstate commerce, beyond the power of the State, simply because the value of that railroad as a whole is created partly — and perhaps largely — by the interstate commerce which it is doing."

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Class 504 Utility Personal Property Valuation

Final Thoughts

"Those who are professionally, legally, or judicially concerned with fair and accurate property tax assessments for utility properties must have a clear and definite understanding of both the meaning and the concepts of value. The appraiser of public utility property is almost always obliged to be content with a collection of economic facts which are clearly in the category of "second best" when compared with selling prices of individual properties as a whole."

Arlo Woolery, CAE, *Valuation of Railroad and Utility Property*, Lincoln Institute of Land Policy (1992)

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Class 504 Utility Personal Property Valuation

Final Thoughts (2)

- "Appraisers must learn to recognize economic changes and how to respond to them.
- It is never wise to assume that if there were a better way of doing something, it already would have been found.
- In spite of the most pessimistic forecasts by informed observers, the world didn't come to an end. It just changed.
- Never underestimate markets and the information they provide. Money is smarter than appraisers."

Arlo Woolery, CAE, *Valuation of Railroad and Utility Property*, Lincoln Institute of Land Policy (1992)

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Summary & Final Questions on Valuation?

- Methodology
  - ATB/SJC Case Law
  - 50% NBV 50% RCNLD
- Discovery
  - Form of List/ 38F Letter
    - Review for Changes
  - DPU Annual Reports
- Valuation Tools:
  - Handy-Whitman Index
  - Marshall & Swift Manual
  - Gas Technology Inst. Study
  - Producer Price Index
  - ASA Textbook

Is there a lioness in that tree?

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