
In-house Revaluation Cost-Benefit Analysis

**Massachusetts Department of Revenue
Division of Local Services
Information Technology**

In-house Revaluation Cost-Benefit Analysis

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Executive Overview

In-house vs. Contracted Mass Appraisal

Tight budgets encourage local officials, be it Boards of Assessors, Finance Committees, Boards of Selectmen, Mayors and others, to consider ways to save money. The costs of periodic revaluations and associated updates are often highly visible in these discussions. Officials consider whether they can cut costs and perhaps improve the quality of assessments by bringing some or all mass appraisal functions in-house, i.e. doing the work with municipal staff and/or board volunteers. At one time, the choice of appropriate computer hardware and software was an important part of such deliberations. No more. Many different reasonably priced software systems can now perform as effective tools for in-house work. Virtually all popular software runs on standard hardware platforms.

The key issue, then and even more so now, is who will do the work? Do they have the time, training, and experience to undertake and complete in-house work? If they are attempting in-house work for the first time, have they carefully planned the effort (using a methodology like that detailed below), or are they trusting in assumptions and good intentions? Do they have appropriate appraisal skills? Can they use the computer software available to them effectively, from data quality control to analytical insight into valuation trends? Can they meet production goals in the field while ensuring that prudent system administration policies are followed back in the office to safeguard all the data and analysis? Are they prepared to take responsibility for the values they generate and explain them to regulatory officials and concerned taxpayers?

Finally, having done all of the above and more, do they have the continuing support of the community's financial management team? If they save the community substantial amounts of money through dedicated professionalism, will their reward be a cut in their department's budget the following year, cuts that make on-going in-house work untenable?

Many communities that have organized their assessment and tax administration functions around in-house mass appraisal have done high quality work at very low cost. Other communities that have misunderstood the staffing commitment have been far less successful, often returning to contracted firms to carry on these functions. The simple but difficult secret for success, therefore, is in hiring and retaining the right people. The qualified and motivated staff, with sufficient support and a reasonable schedule, can achieve the savings that municipal executive and legislative leaders seek and the accurate, equitable values that taxpayers demand.

How to find the right people? A multi-year revaluation program requires attention to detail, careful planning, and an awareness of the importance of meeting production goals. A person with those qualities will appreciate the relevance of the following methodology.

Introduction

Cost -Benefit Analysis

When considering any new mass appraisal system or revaluation approach, it is important for local officials to analyze the costs and benefits associated with both the proposed system/approach and those associated with alternate methods. By comparing the various options side by side, local officials can increase the likelihood of making the best decision for their communities.

The purpose of this **Cost-Benefit Analysis** is to give local officials a framework for comparing two alternate methods of meeting state assessment certification requirements:

In-House Revaluation **vs** **Contract or Turn-Key Revaluation**

This Cost-Benefit Analysis will concentrate on numerical data, comparing the average annual costs associated with each method over a period of years. When reviewing the results of the Cost-Benefit study, it is extremely important not to overlook the qualitative factors involved. In addition to the fiscal considerations, officials should give attention to questions such as:

- Which method is likely to produce better quality assessments?
- Which method is likely to be more responsive to local needs?
- Which method complements the community's track record in hiring and retaining professional staff?

Answers to these and other questions, combined with the quantitative estimates produced by this report, can assist local officials in making the crucial decisions related to the direction of assessment administration in their communities.

OUTLINE OF THE COST-BENEFIT ANALYSIS

The analysis is divided into four parts.

Part 1 is overview of the level of activity needed to complete the field work required by a revaluation or re-inspection program. In the example shown, 10 appraisals per day would be required to inspect 4000 parcels over a 3 year period after considering such factors as time lost for bad weather, sick leave, time needed to process building permits, and so on.

Part 2 is used to estimate how many hours of appraisal time will be required to complete the revaluation project and how this compares to the availability of the existing staff.

Part 3 estimates the costs associated with the in-house revaluation program. These costs are those that are above and beyond those of the existing staffing.

Part 4 estimates the costs associated with a contract revaluation program, averaged over a 12 year period.

ASSUMPTIONS OF THE COST-BENEFIT ANALYSIS

Before undertaking an analysis and drawing any conclusions about the benefits and costs of conducting all or part of a revaluation/value maintenance effort in-house, there should be a common understanding of the revaluation process that is being analyzed.

This Cost-Benefit Analysis is principally applicable to the "mass appraisal" functions. There are additional costs and/or benefits associated with the tax administration and collection functions that are not covered in this analysis.

Here are the assumptions about a municipal revaluation process on which the following cost benefit analysis is based.

The in-house revaluation process is of a cyclical nature, with the work being allocated typically on a three-year cycle. For example, one-third of a community's property is inspected each year over a three-year cycle. This is unlike the typical "contract" revaluation, in which all of the revaluation related activities, such as property inspection, value production, etc. are completed in a minimum amount of time.

If a community invests in a Computer Assisted Mass Appraisal (CAMA) System, it gives assessing officials a set of tools that will enable them to conduct the community's assessment administration program on an "in-house" basis. There are certain activities required by any revaluation program. These include:

- **Analytical Activities** Analysis of sales, income and expense information, and other market-related data must be done on a continuous basis to support assessment production and maintenance activities.
- **Property Inspection Activities** All property in the community must be inspected on a periodic basis.
- **Property Valuation Activities** New values for all property must be generated as part of the cyclical assessment certification process.
- **Valuation Review Activities** All values generated by the program must be carefully reviewed in the field to insure accuracy, equity, and adherence to Department of Revenue guidelines.

Revaluation and certification activities, as indicated above, are labor intensive. As part of the planning process, of which this cost-benefit analysis is a part, local officials must carefully examine the required tasks in order to determine the number and type of personnel required to complete the certification process.

Communities are encouraged to carefully examine the nature of the work being done by their assistant assessors or appraisers. Particular attention should be paid to work being done by these people that could be done by a clerical staff member. In many cases, it may cost the community less to increase clerical hours, enabling professional staff members to spend more time on revaluation activities, than to hire new appraisal personnel.

This analysis attempts to estimate the "marginal" costs associated with an in-house revaluation program. Since most communities currently employ persons in various areas of assessment administration, it is necessary to estimate only these additional, or "marginal" costs incurred if the community elects to begin its own revaluation program.

Because elements of both an in-house and a contract revaluation program have useful lives of several years (i.e. computer hardware, property inspections), this study averages all costs over a 12 year period.

COST BENEFIT ANALYSIS - INSTRUCTIONS FOR PART 1

Purpose

Part 1 of the Cost Benefit Analysis is used to estimate the overall level of appraisal and assessment activity needed to complete a revaluation program. As a first step in the analysis, this calculation can be useful in determining whether an in house program can be attempted without major changes in personnel levels.

Instructions for Completing Part 1

- Line 1: This represents the maximum number of work days per year (52 weeks X 5 work days per week).
- Line 2: Enter the number of vacation days per year for the person who will perform most of the field inspections.
- Line 3: Estimate the number of sick days per year lost by the principal field appraiser.
- Line 4: Estimate the number of days spent by the appraiser each year in training, conferences, workshops, etc. This would include the MAAO annual school, MAAO conferences, etc.
- Line 5: Estimate the number of days lost to the principal appraiser for personal reasons not covered above.
- Line 6: The number of potential days remaining for field work is calculated by subtracting the sum of lines 2,3,4 & 5 from Line 1.
- Line 7: Estimate the number of full work days per year required to process building permits (new construction).
- Line 8: Estimate the number of full work days per year, on average, required to process abatement applications.
- Line 9: The number of days potentially available for the principal appraiser to conduct field inspections and appraisals, after processing of new construction and abatements, is calculated by subtracting the sum of lines 7 and 8 from 6.
- Line 10: Estimate the average number of days per year lost to field work as a result of bad weather.
- Line 11: The net number of days available to perform revaluation field work is calculated by subtracting line 10 from line 9.
- Line 12: The percentage of time that an assistant assessor should be available for appraisal field work is calculated by dividing line 11 by line 1 and multiplying by 100.
- Line 13: Enter the number of parcels of real property to be revalued during the complete revaluation cycle.
- Line 14: Enter the number of years in the inspection cycle.
- Line 15: Multiply line 11, net available appraisal days, by line 14, number of years in the inspection cycle. Divide line 13, number of parcels to be appraised by this result, yielding the gross production rate per day needed to complete the field work for the revaluation.

EXAMPLE: PART 1**Estimation of Appraisal Resources Required**

1	Maximum Work Days Per Year	260
2	Vacation days per year	10
3	Sick Days	5
4	Training/Education/Conferences	10
5	Personal days	3
6	Effective Work Days per year	232
7	Building Permit Days	30
8	Abatement Days	20
9	Gross Days Available for Appraisals	182
10	Bad Weather Days	20
11	Net Available Appraisal Days	162
12	% of Time Available for Appraisal Field Work	62.31%
13	# Parcels to be Appraised/Inspected	4000
14	# Years in Inspection Cycle	3
15	Gross Production Rate per day	8.2

COST BENEFIT ANALYSIS - INSTRUCTIONS FOR PART 2

Purpose:

Part 2 of the Cost Benefit Analysis will assist in estimating the number of hours of appraisal type work that will have to be added to the Assessor's budget in order to successfully complete the inspection of properties within the desired period of time (inspection cycle).

Instructions for Completing This Form:

Enter the number of regular work hours per day that apply to property inspectors.

Rows 1 through 5 are utilized to estimate the number of hours of field inspection time that will be required to complete the full project. The field inspections have been divided into 4 categories:

Row 1: Those properties for which an interior inspection, as well as an exterior inspection is highly desirable. If the appraiser is unable to gain entry during the first attempt, clerical staff will attempt to make an appointment by calling or writing the owners. In Column A of Row 1, estimate the number of parcels falling into this category. In Column B, estimate the number of these parcels that can be inspected during a full day of inspection activities. Calculate Column C, the number of hours per inspection, by dividing the number of work hours per full day by the entry in Column B, the number per day. Enter this number in Column C. Column D, the number of hours required to complete this activity, is computed by multiplying Column A by Column C.

Row 2:

This section is used to estimate the workload required for properties in which the appraiser or lister will inspect the exterior of properties and will attempt to gain entry to the interior on the first call only. No follow-up attempt to make an interior inspection will be made unless requested by the property owner or indicated by the exterior inspection. The calculations for Columns A-D are done in the same manner described for Row 1 above.

Row 3: Estimates are made for properties requiring only exterior inspections.

Row 4: Estimates for properties requiring only field review.

Row 5:

Column A is the sum of rows 1-5. Column D, the total number of hours estimated to complete all fieldwork for the revaluation, is computed by totaling the entries in Rows 1-4 of Column D.

Rows 6-10 are used to estimate the times needed to complete other tasks related to the revaluation project. Rather than directly estimate the number of hours required for each task, a percentage of the total inspection time computed in Row 5, Column D, is made.

Row 6:

Column B is entered as the estimate of the percentage of the total inspection time needed to complete a valuation field review of all properties, after value generation has been completed. Column D is calculated by multiplying this percentage by the total inspection time, Row 5, Column D.

Row 7:

This item is an estimate of the time needed to complete the analytical functions related to the reappraisal project. Included in this category are creation of land and depreciation tables, review of cost tables, 'multiple regression analysis (if utilized), ratio studies, etc. The calculations for this row are done in the same manner as Row 6 (above).

Row 8:

Estimate the amount of time that appraisal personnel might spend in data entry functions. For example, after completing the inspection of a neighborhood, the appraiser might return to the office and enter the quality grade, and condition for each property inspected. Calculate as in Row 6.

Row 9:

Estimate the percentage of total inspection time used in public relations activities, such as impact meetings, meetings with taxpayers associations, etc. Calculations as in Row 6.

Row 10:

Estimate the percentage appropriate to activities related to the revaluation project that are not listed above. Calculate as in Row 6

Row 11:

Compute the total number of hours needed for the inspection, appraisal, and analysis activities related to the revaluation by adding the total inspection hours (Row 5, Column D*) and Rows 6 - 10 in column D.

Row 12:

Enter the number of years in the revaluation or certification cycle.

Row 13:

Calculate the number of hours required annually for the project by dividing the total hours for the revaluation cycle (Row 11), by the number of years in the cycle (Row 12).

Rows 14 through 17 estimate the number of hours per week, on that specified personnel are currently available (without additional payroll costs) for revaluation activities.

Row 14:

Estimate the number of hours per week that the assistant assessor(s) is available for the revaluation project. (Column A). Multiply this by 50 weeks and enter in Column B. As a check on this estimate, multiply Part 1, Line 12, % of Time Available for Appraisal Field Work, by the normal work week in your community. The results of these two estimates of field time available should be consistent.

Row 15:

Estimate the number of hours per week that appraisal personnel are available for the revaluation project. Multiply by 50 weeks and enter in Column B.

Row 16:

Estimate number of man hours per week the Assessors are available for revaluation activities. Multiply by the number of weeks that the assessors are available and enter in Column B.

Row 17:

Compute the total number of man hours available per year for the revaluation project by totaling Rows 14-16 in Column B.

Row 18:

Subtract Row 13, Column D (number of hours annually required for the project) from Row 17, Column B (number of hours currently available on staff to perform the project). If this number is greater than zero, it indicates that provision must be made to acquire additional appraisal or inspection assistance to complete the project. If the number is negative (less than zero), it indicates that the existing staff should be sufficient to complete the project.

EXAMPLE PART 2

Number of Work Hours/Day	8
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	Category	A Parcel Count	B Number/Day	C Hours/Parcel	D Hours/ Project
1	Inspect Interior & Exterior (Call Back Required)	2,000	5	1.6	3,200
2	Interior & Exterior Inspection (First Call Only)	1,000	15	0.5	533
3	Exterior Inspection Only	1,000	25	0.3	320
4	Field Review Only	500	50	0.2	80
5	Total Inspection Time	4,500			4,133

	Additional Overhead Time	% Of Inspect Time	Hours
6	Field Review	10%	413
7	Analysis	5%	207
8	Data Entry By Appraisers	5%	207
9	Public Relations	5%	207
10	Misc	10%	413
11	Total Revaluation Hours Required		5,580
12	Years For Revaluation Cycle		3
13	Hours Per Year Required		1,860
	Personnel Available	Hour/Week	Hours/Year
14	Assistant Assessor	20	1,040
15	Appraiser	0	0
16	Assessors	15	780
17	Totals	35	1,820
18	Additional Hours/Year Required		40

COST BENEFIT ANALYSIS - INSTRUCTIONS FOR PART 3

Purpose: After estimating the number of man hours needed to complete the revaluation job and the number of hours currently available on staff for revaluation functions, Part 2 of the Cost Benefit Analysis computed the number of additional hours of inspectional and/or appraisal help will be needed (if any) to complete the project. Part 3 is then utilized to estimate the annual cost to the community of hiring the additional Personnel needed to complete the project, along with annual costs associated with the hardware and software, startup, and maintenance of the equipment.

If additional appraisal or inspectional help is required, a number of steps should be considered.

1. Determine whether the assistant assessor or appraiser is spending time on work which could be done by a clerical person. Since clerical pay is typically less than appraisal or lister pay, the shift of hours to clerical help can free the appraiser, assistant assessor, or property lister to spend more time on revaluation work.
2. Determine the number of hours that members of the Board of Assessors could be made available for the revaluation project.
3. If the combination of shifting clerical work from the assistant assessor and/or appraiser, and utilization of members of the Board of Assessors does not provide a sufficient number of hours to complete the project (based on estimates made in Part 2), determine the breakdown of hours required for property listers (relatively inexperienced persons) or property appraisers (relatively experienced persons). Estimate the base hourly rate to be paid to these persons and a percentage of this rate to be added on to cover employee benefits, and travel expenses.

Instructions for Completing This Form:

Under the column "Base Rate Per Hour", enter the average base pay rates for the various classes listed: Property Lister, Appraiser, Board of Assessors member, Clerical. If other job titles or classifications are used, make the necessary corrections.

Under the column "Benefit Factor", enter the factor (i.e. 1.25) required to adjust the base pay to allow for job benefits and travel costs.

The Column "Net Rate" is computed by multiplying "Benefit Factor" by "Base Rate Per Hour".

In the column market "Annual Hours", enter the number of annual hours above current staffing levels for each category needed to complete the project. Under the clerical category, enter the number of hours shifted from the assistant assessor, appraiser, or assessor to clerical staff. Any additional clerical hours needed to support the project (on an annual basis) should also be entered here. The total annual hours of listers, appraisers, and assessors should be compared to the results of Part 2, "Additional Hours Per' Year" to insure that sufficient time has been allocated to complete the project.

The column "Annual Cost" is computed by multiplying the annual hours listed for each category by the "Net Rate".

The labor costs column should be totaled and entered on the line "Total Labor Costs".

Under "Hardware & Software Costs", estimate the total cost of the computer hardware and operating system software. Divide this by 12 and enter under the "Annual Cost" column. This calculation is made to estimate the annual cost to the community of the computer, averaged over a 12-year period.

Under "Other Start-up Costs", estimate other costs associated with the installation and startup of the CAMA system. Such items might include office wiring (if needed), costs associated with initial data entry or data conversion, computer desks, etc. Divide by 12 to annualize this item and enter in the Annual Cost Column.

Add the cost of the annual hardware maintenance contract under the "Annual Cost" Column.

Add the total labor costs, hardware and software costs, other startup costs, and hardware maintenance costs. Enter under total costs. This represents the annualized cost, over a 3 year cycle, of the in-house revaluation program.

EXAMPLE**PART 3****Estimation of Marginal Costs Associated with In-House Certification Program****Assumptions:**

1. Shift of clerical type work from assistant assessor to clerks
maximizes amount of time Asst. Assessor has for conducting property inspections
2. Use of 12 year cycle to annualize costs
3. Labor costs are those costs over and above currently budgeted

Additional Labor Costs Required Annually:**Inspection Cycle: 3**

	Base Rate Per Hour	Benefit Factor	Net Rate	Total Hours	Total Cost	Annual Cost
Property Lister	\$10.00	1.20	\$12.00	900	\$10,800	\$3,600
Appraiser	\$15.00	1.20	\$18.00	100	\$ 1,800	\$ 600
Bd of Assessors	\$10.00	1.20	\$12.00	200	\$ 2,400	\$ 800
Clerical	\$ 8.00	1.20	\$ 9.60	500	\$ 4,800	\$1,600

Total Annual Labor Costs:		\$19,800	\$6,600
Total Hardware/Software Costs:	\$12,000	Annualized Cost	\$1,000
Other Startup Costs:	\$5,000	Annualized Cost	\$417
Annual Hardware Maintenance Costs			\$2,500
Total Annualized Costs			\$10,517

COST BENEFIT ANALYSIS - INSTRUCTIONS FOR PART 4

Purpose

Part 4 of the Cost Benefit Analysis is used to estimate the average or annual cost associated with certification programs conducted by revaluation contractors (turn key type programs).

Assumptions

1. The contractor performs all needed work for the certification program. This includes interior and exterior inspections (as required), field review, value estimation, data entry (if needed), clerical support, printing of property record cards, public relations, and other required services.
2. In order to average the cost of these services, a 12-year cycle is utilized. If a shorter or longer cycle is desired for this analysis, make sure that those in-house costs which have been annualized in Part 3 are also adjusted for the new cycle.
3. Certification as required by the Department of Revenue is accomplished on a 3 year cycle.

Instructions for Completing this Form

Number of Parcels estimate the number of parcels to be processed by the in-house or contract certification program. This number should be consistent with those used in earlier parts of this analysis.

Year of Phase

In the column marked "Year of Phase", circle the year your community is next scheduled for certification. Circle each subsequent year you will be scheduled for certification. A total of 4 certification years should be circled.

Event

Estimate the type of certification program that is expected to be needed for the certification years circled. Some of the choices include:

Full Revaluation - Includes full interior and exterior inspections and new measurements.

Partial Revaluation - Includes partial inspection program..

Reappraisal - Recalculation of all values with valuation field review.

Update - Trending program with valuation field review.

Cost/Parcel

Estimate the cost per parcel of each of the types of certification programs listed in the Event column.

Total Cost

The Cost per Parcel by the Number of Parcels for each of the certification cycle entries. Sum the entries of this column.

Annualized Cost Divide the sum of the certification costs by the length of the cycle used to annualized the revaluation costs, typically 12 years.

Conclusions

Compare the annualized costs estimated in Part 3, "In-House" revaluation program, with that estimated in Part 4, "Contract" Certification. Remember that these estimated costs have been "annualized" over a 12-year cycle. Actual costs in any one year of this cycle may vary substantially from these averages.

Other Factors to Consider

If different vendors provide your community's CAMA and tax billing & collection systems, there may be additional costs associated with data conversions or bridge programs between the two systems. Further analysis can be completed to determine the likely amounts and any other factors.

Certain benefits cannot easily be given dollar values. Of particular interest here are the quality advantages or disadvantages associated with in-house versus contract revaluation and certification services. These factors should be carefully analyzed; your conclusions in this area may outweigh the cost estimates made in this study.

EXAMPLE PART 4

Estimation of Costs Associated With a Contract Certification Program

Assumptions:

1. Contractor performs key service
2. Use of a 12-year cycle to annualize costs
3. Certification work done on a 3 year cycle with minimal maintenance between certification years
4. Cost per parcel for contract certification work increases related to the time since the last full property inspection program
5. The costs per parcel shown in this example illustrate the necessary calculations. They do not represent any attempt to estimate actual costs for these services.

Number of Parcels in Community: 4,500

Year of Phase	Event	Cost/Parcel	Total Cost
2003	Update	\$10.00	\$45,000
2004			\$0
2005			\$0
2006	Reappraisal	\$20.00	\$90,000
2007			\$0
2008			\$0
2009	Update	\$10.00	\$45,000
2010			\$0
2011			\$0
2012	Reappraisal	\$25.00	\$112,500
2013			\$0
2014			\$0
	TOTAL COST		\$292,500
	ANNUALIZED COST		\$24,375

FORMS

COST BENEFIT ANALYSIS: PART 1

Estimation of Appraisal Resources Required

1	Maximum Work Days Per Year	
2	Vacation days per year	
3	Sick Days	
4	Training/Education/Conferences	
5	Personal days	
6	Effective Work Days per year	
7	Building Permit Days	
8	Abatement Days	
9	Gross Days Available for Appraisals	
10	Bad Weather Days	
11	Net Available Appraisal Days	
12	% of Time Available for Appraisal Field Work	%
13	# Parcels to be Appraised/Inspected	
14	# Years in Inspection Cycle	
15	Gross Production Rate per day	

COST BENEFIT ANALYSIS:**PART 2**

Number of Work Hours/Day	
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	Category	A Parcel Count	B Number/Day	C Hours/Parcel	D Hours/ Project
1	Inspect Interior & Exterior (Call Back Required)				
2	Interior & Exterior Inspection (First Call Only)				
3	Exterior Inspection Only				
4	Field Review Only				
5	Total Inspection Time				
	Additional Overhead Time	% Of Inspect Time		Hours	
6	Field Review				
7	Analysis				
8	Data Entry By Appraisers				
9	Public Relations				
10	Misc				
11	Total Revaluation Hours Required				
12	Years For Revaluation Cycle				
13	Hours Per Year Required				
	Personnel Available	Hour/Week		Hours/Year	
14	Assistant Assessor				
15	Appraiser				
16	Assessors				
17	Totals				
18	Additional Hours/Year Required				

COST BENEFIT ANALYSIS:

PART 3

Estimation of Marginal Costs Associated with In-House Certification Program

Assumptions:

- 1. Shift of clerical type work from assistant assessor to clerks
maximizes amount of time Asst. Assessor has for conducting property inspections
- 2. Use of 12 year cycle to annualize costs
- 3. Labor costs are those costs over and above curenly budgeted

Additional Labor Costs Required Annually:

Inspection Cycle: 3

	Base Rate Per Hour	Benefit Factor	Net Rate	Total Hours	Total Cost	Annual Cost
Property Lister						
Appraiser						
Bd of Assessors						
Clerical						

Total Annual Labor Costs:

Total Hardware/Software Costs:

Annualized Cost

Other Startup Costs:

Annualized Cost

Annual Hardware Maintenance Costs

Total Annualized Costs

COST BENEFIT ANALYSIS: PART 4

Estimation of Costs Associated With a Contract Certification Program

Assumptions:

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1. Contractor performs key service
 2. Use of a 12-year cycle to annualize costs
 3. Certification work done on a 3 year cycle with minimal maintenance between certification years
 4. Cost per parcel for contract certification work increases related to the time since the last full property inspection program
 5. The costs per parcel shown in this example illustrate the necessary calculations. They do not represent any attempt to estimate actual costs for these services.

Number of Parcels in Community: _____

Year of Phase	Event	Cost/Parcel	Total Cost
2003			
2004			
2005			
2006			
2007			
2008			
2009			
2010			
2011			
2012			
2013			
2014			
	TOTAL COST		
	ANNUALIZED COST		

