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Arson: How Much Does It Cost Your City

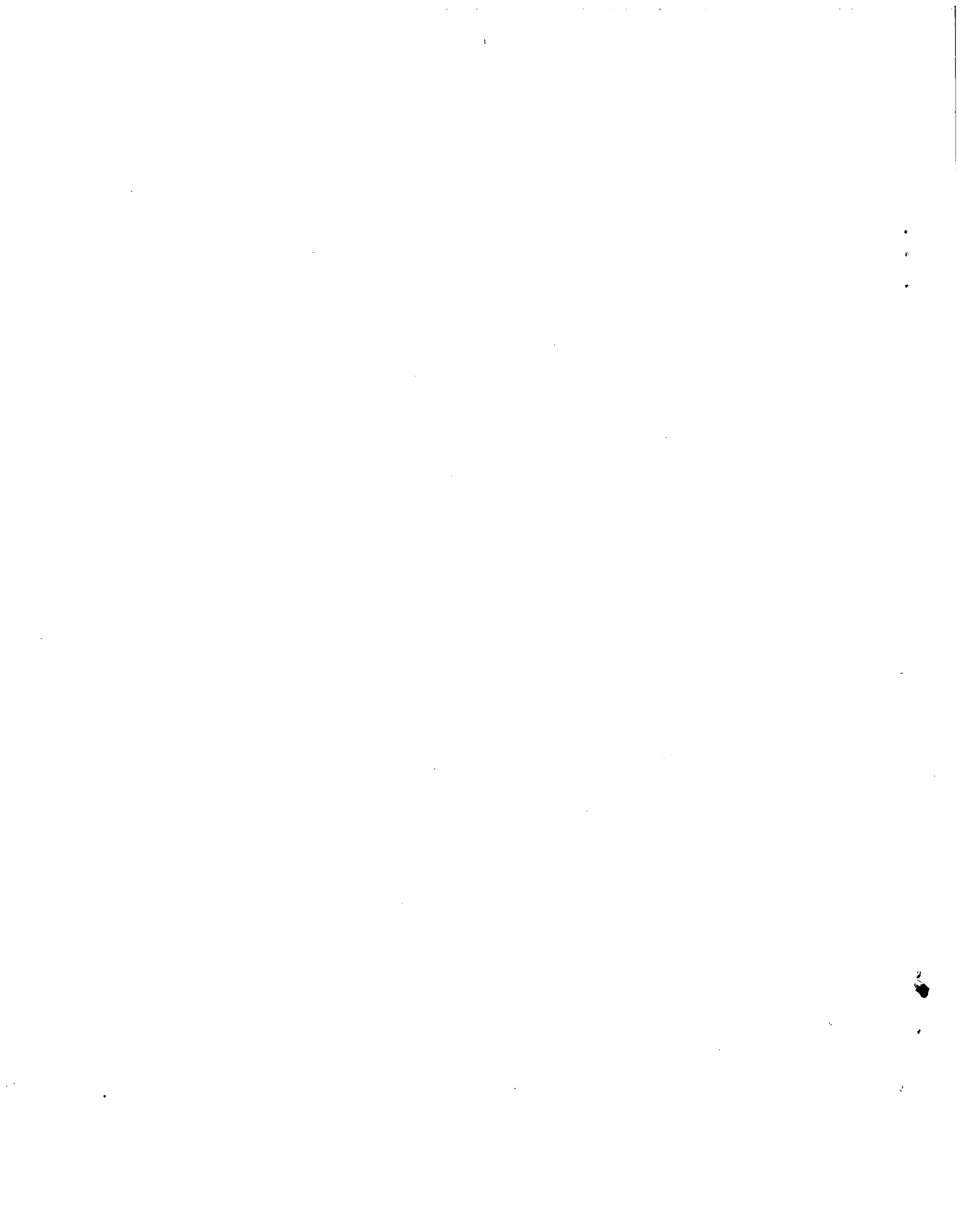
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ARSON: HOW MUCH DOES IT COST YOUR CITY?

by

Frank Logue and Amy Goldman

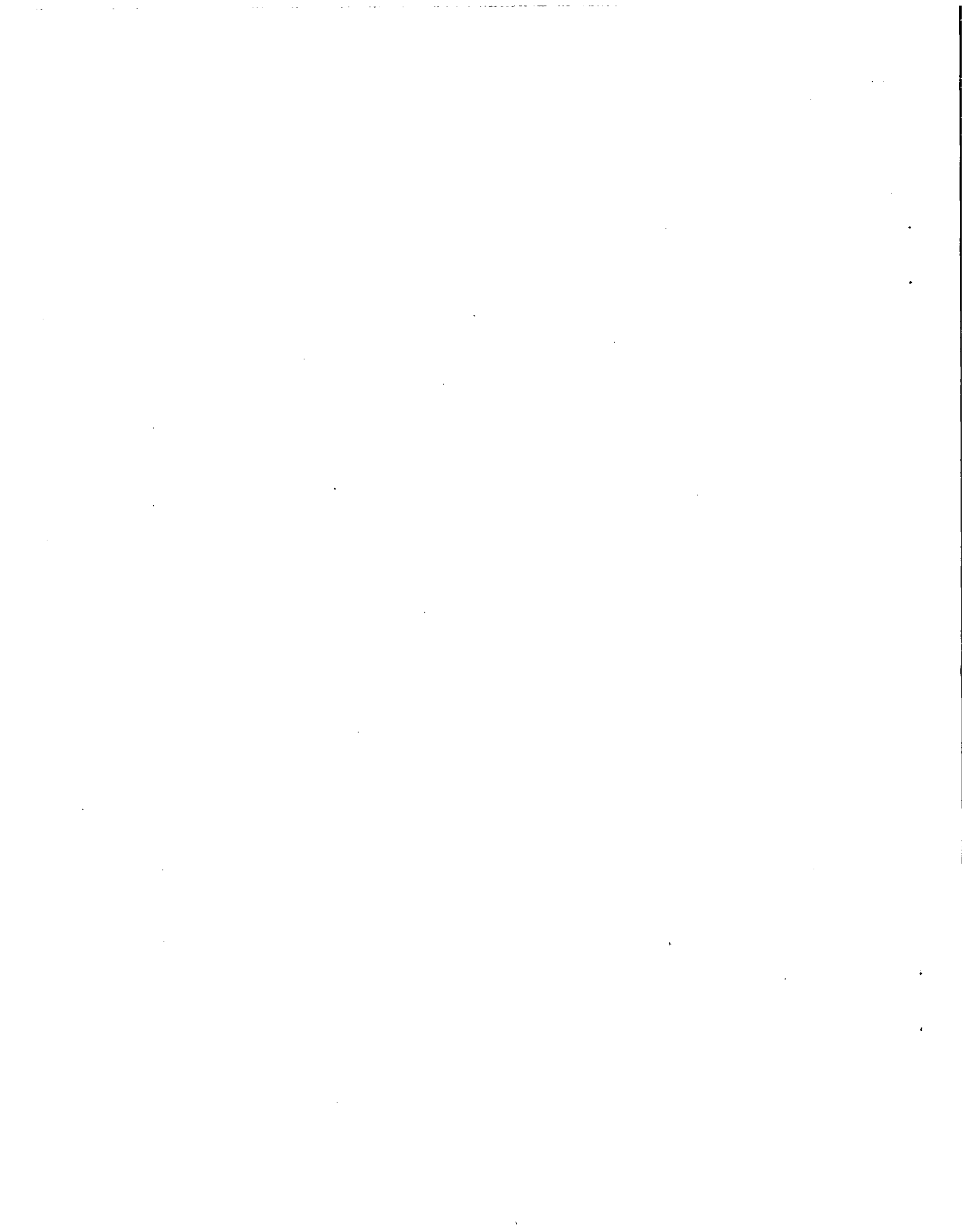
A report to the United States Fire Administration/Federal Emergency Management Agency on the Development of a Cost Model for calculating the impact of arson on Municipal Budget.

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by

Frank Logue and Amy Goldman*

I. INTRODUCTION: PURPOSE OF THE STUDY

As the incidence of arson and the consequent loss of life and property has grown over the past decade, a variety of research efforts have sought to uncover the patterns and impact of arson on individual citizens and their communities. A recent research thrust has been the specification of the costs of arson. One approach seeks to measure municipal property and tax losses due to the occurrence of arson¹ and a second seeks to develop techniques to specify indirect costs of residential fires, i.e., direct costs to individuals other than the value of private property destroyed.² These efforts focus on costs incurred by individuals or reductions in municipal revenues as a result of structural fires of suspicious origin.

The focus of the present study is different. It attempts to develop a methodology for determining a specific dollar figure representing the amount of municipal resources engaged in combating arson and its aftermath. In this context, cost has a specific meaning. By the cost of arson we mean the amount of a municipality's resources expended in preventing, suppressing and investigating arson and eliminating its aftermath. As noted below, there are direct costs (specific anti-arson programs) and indirect costs (that part of ongoing activities attributable to arson). There are also the tax revenues lost due to the destruction of property and that part of the municipality's fire insurance premium payments attributable to arson.

* Amy Goldman, MPPM 1981, Yale School of Organization and Management, did the basic research for this paper.

1. Urban Educational Systems, 153 Milk St., Boston, Mass. 02109

2. Munson, Michael J. and Ohls, James C., INDIRECT COSTS OF RESIDENTIAL FIRES, prepared for the Federal Emergency Management Agency, United States Fire Administration, July, 1979.

The purpose of the study is twofold:

- * To develop a methodology for determining the cost of arson to a municipal government
- * To apply this methodology to one New England city, New Haven, Connecticut

II. METHODOLOGY

In order to accomplish this objective, we chose a case study approach. The choice of the case study, and New Haven as the site, was dictated by several factors: first, its accessibility to us; second, the absence of a readily available, reliable data base of national arson incidence; and third, the variety of modes in which municipal budgets are adopted--making inter-city comparisons very problematic. It was not possible, with our time and resource constraints, to collect this information city-by-city.

New Haven is known for its active anti-arson effort. The Fire Department and the Arson Warning Prevention Strategy (AWPS) collect data on the incidence of fires of suspicious or incendiary origin, New Haven's working definition of arson. Moreover, city budget information is readily available. Thus, New Haven has both of the basic data sources for the methodology of this study.

DATA COLLECTION

Data for the present study come from several sources: interviews with relevant personnel in New Haven city departments and consulting firms; internal reports on fire and police incidence data; personnel levels and program reports; the municipal budget; and studies of other arson prevention programs and evaluations of fire department activities. These data together provide the necessary information to determine the cost of arson to the City of New Haven. Data from all sources are for the 1980 fiscal year (July 1, 1979 to June 30, 1980).

BUDGET

While municipal budget information is readily available, budget analysis is complicated by the fact that department budgets do not include all departmental expenditures, such as fringe benefits and pensions--nor do they include capital expenditures. Fringe benefits and pensions are aggregated elsewhere in the budget and capital expenditures appear in the capital budget. Thorough budget analysis thus entails culling relevant data from other municipal accounts to develop a complete departmental budget figure. For this study, FY '80 approved budget figures were used.

THE MODEL

The specification of the cost of arson to a municipality requires six basic steps:

1. Determination of which municipal departments have some or all of their personnel engaged in preventing, suppressing and investigating arson and eliminating its aftermath.
2. Distinguishing those costs which reflect unique programmatic efforts directed at arson from the arson-related aspects of ongoing departmental activities.
3. Determination of the proportion of time that personnel in a given department spend on arson-related activities relative to other departmental activities. This figure is the department's arson-related indirect cost percentage.
4. Accurate identification of all departmental costs, including those items excluded from a department budget, such as fringes, pensions and capital expenditures.
5. Application of a department's arson-related indirect cost percentage to the departmental budget.

- 6. Calculation of property tax revenues lost and the cost of fire insurance purchased by the municipality.

A more detailed explication of the model is attached as Appendix A.

The two municipal departments most intimately involved in arson-related activities are the Fire and Police Departments. The following section addresses the costs attributable to these and other affected departments.

III. FINDINGS

A. FIRE DEPARTMENT

Following the model laid out above, discussion of the costs of Fire Department activities attributable to arson is divided into two sections: determination of departmental activities which are unique programmatic anti-arson efforts (direct costs) and determination of that percentage of ongoing activity which is arson-related and constitutes the department's indirect costs.

Direct Costs

As noted above, the City of New Haven has an Arson Warning and Prevention Strategy, one of the earliest efforts in the United States to predict in what structures arson is likely to occur. This program is not included in the cost model because it is supported by grant funds and not by city revenues.

The basic direct costs are the salaries, fringe benefits, pension contributions and other expenses of the four Fire Department personnel on the Arson Squad: One captain and three fire investigators.

These costs are set forth in table I.

Table I Direct Costs

Fire Department Investigative Personnel--Arson Squad

Salaries	\$ 65,198
Fringes (a)	4,800
Pensions (a)	<u>15,676</u>
	85,674
Overtime (a)	2,148
Material and Supplies (a)	<u>1,320</u>
	<u>\$ 89,142</u>

(a) The four firefighters on the arson squad are four people out of a 479 person force, or, .8% of the force. This percentage is applied to total departmental expenses to determine that portion allocated to arson squad members.

INDIRECT COSTS

In addition to Fire Investigation, from which the above figures derive, there are six other major categories in the Fire Department budget: administration, fire equipment maintenance, fire training school, communications, firefighting and station maintenance. It is to these categories, as well as to that portion of the fire investigation line item which is not directly engaged in arson activities, that some percentage representing arson-related department activities must be applied.

Determining what part of the ongoing activities of the Fire Department is arson-related can not, as yet, be done with great precision. The New Haven Fire Department response to medical emergencies, with its specially equipped medical emergency vehicles, constituted two-thirds of all the incidents logged by the department in FY 1980. Of the 13,646 incidents in that year, 4638 (34%) were fire incidents. Ninety percent of these were trash, brush, vehicle or other non-structural fires. While most of these are not formally classified as to origin, Fire Chief John P. Reardon estimates that 75% of them are intentionally set.

The most rigorously kept statistics are on the number of structural fires and determinations as to whether these are of suspicious or incendiary origin. In New Haven in 1979 there were 475 structural fires of which 207 or 44% were of suspicious or incendiary origin. The figures for 1980 were 479 and 207, or 43%.

43% seems a reasonable figure to employ as the fire department's arson-related indirect cost percentage for several reasons: (1) the statistics on origins of structural fires are kept rigorously (2) structural fires occupy much more of firefighters' time than non-structural fires, which, except for inaccessible brush fires, are promptly extinguished (3) while it is likely that the overwhelming majority of non-structural fires are intentionally set, there is presently no means of arriving at an accurate percentage.

In a city where there is a clear record as to the origin of all fires, the appropriate arson-related indirect cost percentage would be the proportion of all fires of suspicious or incendiary origin (or the local working definition of arson.)

In Table II, which follows, the 43% figure is allocated to the major budget categories of the New Haven Fire Department.

Table II
Indirect Fire Department Arson Related Costs by Line Item

	Arson Related	Total Department
Administration		
Personal (a)	\$ 65,493	\$ 152,310
Non-personal (b)	<u>43,875</u>	<u>102,036</u>
	109,368	254,346
Fire Equipment Maintenance		
Personal	45,390	105,558
Non-personal	<u>20,607</u>	<u>47,924</u>
	65,997	153,482
Fire Communications		
Personal	4,084	9,498
Non-personal	<u>99</u>	<u>230</u>
	4,185	9,728
Fire Training School		
Personal	26,225	60,989
Non-personal	<u>3,412</u>	<u>7,936</u>
	29,637	68,925
Fire Investigation & Inspection (c)		
Personal	84,379	196,231
Non-personal	<u>797</u>	<u>1,854</u>
	85,176	198,085
Firefighting		
Personal	3,132,658	7,264,322
Non-personal	<u>269,735</u>	<u>627,286</u>
	3,393,394	7,891,608
Station Maintenance		
Personal	23,714	55,151
Non-personal	<u>6,572</u>	<u>15,283</u>
	30,286	40,434
	3,718,041	<u><u>88,645,608</u></u>

(a) Overtime is included in this table. Fringes and pensions are not.

(b) Non-personal expenses include station and vehicle upkeep, heat and utilities, books, materials and supplies and contractual services.

(c) Does not include the direct costs of the Arson Squad noted in Table I.

TOTAL DIRECT AND INDIRECT FIRE DEPARTMENT COSTS

The arson-related direct, indirect, and capital budget costs totals \$4,955,079. for the New Haven Fire Department during FY '80. This represents 42.2% of all department costs. These costs are broken down in Table IV.

Table IV

Comparison of Total Direct and Indirect Arson-Related and Total Fire Department Expenses

	<u>Direct</u>	<u>Indirect</u>	<u>Total Arson-Related</u>	<u>Total Department</u>
Salaries	65,198	3,373,394	3,438,592	8,100,842
Fringes	4,800	248,282	253,082	600,000
Pensions	15,676	809,614	825,290	1,259,499
	<u>3,468</u>	<u>344,647</u>	<u>348,115</u>	<u>810,164</u>
	89,142	4,775,937	4,865,079	11,470,505
Capital Budget	<u> </u>	<u>90,000</u>	<u>90,000</u>	<u>245,000</u>
	89,142	4,865,937	4,955,079	11,715,505

Table III

Indirect Fire Department Arson-Related Costs by Expenditure Category

Personal	
Salaries	3,373,394
Fringes	248,282
Pensions	<u>809,614</u>
	4,431,290
Non-Personal	334,647
Capital Budget ¹	<u>90,000</u>
Total Indirect Costs	4,865,937

(1) The total FY 80 Capital Budget was \$245,000, including \$35,000 for an Emergency Unit responding to medical emergencies, mostly non-fire related. The figure here is 43% of the remainder of the capital budget.

B. POLICE DEPARTMENT

The Police Department is the other city agency with a defined programmatic commitment directed against arson, expressed in several ways. Three police detectives work on the Arson Squad as the criminal investigation half of the fire-police team. Second, police are sent to the site of every structural fire for preliminary investigation and traffic control purposes. Third, buildings which have been referred by the Arson Warning Prevention Strategy as likely targets of arson are visited once every two weeks as part of New Haven's directed deterrent patrol program.* As with the Fire Department, arson-related costs of the Police Department can be categorized as direct or indirect.

DIRECT COSTS

The Police Department's direct costs are those associated with the assignment of three detectives to the Arson Squad.

Costs to the Police Department of the Arson Squad are:

3 Detectives @ \$15,957	\$47,871
Fringes	3,002
Pension	<u>12,849</u>
	\$ 63,722
Non-personal	<u>6,468</u>
Total	\$ 70,190

* After experiments in Kansas City and elsewhere demonstrated the negligible impact of random police patrol, the City of New Haven designed and implemented the directed deterrent patrol program. The times and places where crime was occurring were plotted and deterrent runs were constructed directing officers to patrol prescribed routes at the times and places where crime was deemed most likely to occur.

INDIRECT COSTS

The indirect cost in the Police Department is that fraction of ongoing police activity attributable to arson. The basic unit of measurement of police activity is a call for service. Of the 122,578 calls for service during FY '80, 279 were in response to structural fires of suspicious or incendiary origin and 672 were arson-related directed deterrent runs, for a total of 951 arson related calls for service. The arson related calls for service constituted .7% of police activity during FY '80.

This .7% of police activity attributable to arson is the percentage figure applied to the line items in the Police Department budget - chief's office, planning and personnel, administration, support services, community affairs, and operations-to determine Police Department indirect costs. These indirect costs are exhibited in Tables V and VI by line item and by expenditure category respectively.

Table V

Indirect Police Department Arson Costs by Line Item

	Arson Related	Total Department
Chief's Office		
Personal (a)	\$ 2,651	\$ 378,716
Non-personal (b)	<u>176</u>	<u>25,128</u>
	2,827	403,898
Planning & Personal		
Personal	982	140,394
Non-Personal	<u>276</u>	<u>39,442</u>
	1,258	178,836
Administration		
Personal	6,250	892,852
Non-personal	<u>334</u>	<u>47,812</u>
	6,584	940,664
Support Services		
Personal	4,895	699,293
Non-personal	<u>6,233</u>	<u>890,422</u>
	11,128	1,589,715
Community Affairs		
Personal	2,972	424,670
Non-personal	<u>20</u>	<u>2,960</u>
	2,992	427,630
Operations		
Personal (c)	36,546	5,220,958
Non-personal	<u>424</u>	<u>60,550</u>
	36,970	5,281,508
	<u> </u>	<u> </u>
	\$ 61,759	\$ 8,823,251

(a) Does not include pensions or fringe benefits

(b) Non-personal expenses include utilities, travel, equipment and maintenance, materials and supplies, contractual services, longevity and educational incentives.

(c) Does not include arson squad positions.

Table IV
Indirect Police Department Arson Related Costs by Expenditure Category

Personal		
Salaries	\$ 54,296	
Fringes	3,482	
Pensions	<u>14,900</u>	
		\$ 72,678
Non-personal		7,463
Capital Budget		<u>1,015</u>
		\$ 81,156

TOTAL DIRECT AND INDIRECT POLICE DEPARTMENT COSTS

Direct and indirect arson related costs of the Police Department total \$145,878, or 1.25% of the department's \$11,657,997 budget. These figures are compared below.

Table VII
Comparison of Total Direct and Indirect Arson Related and Total Police Department Costs

	Direct	Indirect	Total Arson-Related	Total Department
Salaries	47,871	54,296	102,167	7,804,730
Fringes	3,002	3,482	6,484	500,400
	<u>12,849</u>	<u>14,900</u>	<u>27,749</u>	<u>2,141,499</u>
	63,722	72,678	136,400	10,446,629
Non-personal	6,468	7,463	13,931	1,066,368
Capital Budget	<u> </u>	<u>1,015</u>	<u>1,015</u>	<u>145,000</u>
	70,190	81,156	151,346	11,657,997

C. OTHER DEPARTMENTS

Although police and fire are the primary municipal departments that are involved in arson suppression and prevention, there are several other municipal departments where a portion of agency activity is arson related. In the City of New Haven, these agencies are the Building Department, the Housing Conservation and Code Enforcement Agency and the Redevelopment Agency.

The Building Department's inspectors in its Bureau of Electricity work with the Arson Squad in the initial investigation after a fire to help determine the cause of the fire. The Building Department is also responsible for issuing permits required for demolition of vacant buildings.

The Housing Conservation and Code Enforcement Agency is responsible for investigation and follow up of housing code violation complaints. The agency works closely with the Arson Warning Prevention Strategy in the inspection of buildings which have been identified as possible arson targets.

The Redevelopment Agency is responsible for demolition and seal up of vacant buildings when the owner cannot or will not demolish. Most of the demolitions which the agency has undertaken have been part of the city's urban renewal and redevelopment program, but a small portion of its demolitions are emergency fire demolitions.

The major arson related activity of the Building Department is conducted by the Bureau of Electrical Inspection. Since this is part of the Department's normal operations, the arson related portion of that activity is an indirect cost. Of the 7,400 electrical inspections conducted in FY '80, 279 or 4% were in buildings which had experienced fires of suspicious or incendiary origin. This 4% figure is applied to the total agency budget to determine arson related indirect cost. The Building Department indirect arson cost is detailed in Table VIII.

HOUSING CONSERVATION AND CODE ENFORCEMENT AGENCY

The Housing Conservation and Code Enforcement Agency receives and investigates approximately 3,000 complaints each year. In conjunction with the Arson Squad and the Arson Warning Prevention Strategy, the department's investigators inspect all buildings where there has been a fire of suspicious or incendiary origin. Thus, of the 3,000 investigations during fiscal year 1980, 279 or 9%, are of arson related origin. Again, since this work is part of ongoing department activities, these costs are considered an indirect expense and the 9% is applied to the general administrative portions of the agency budget. Costs for the agency are detailed in Table VIII.

Table VIII
 Building and Housing Code Department Arson-Related Costs

	<u>Arson Related</u>	<u>Total Department</u>
Building Department		
Personal		
Salaries	\$ 10,555	\$ 263,620
Fringes	623	15,568
Pension	846	21,147
	<u>\$ 12,024</u>	<u>300,335</u>
Non-Personal	<u>486</u>	<u>12,152</u>
Total	\$ 12,510	\$ 312,487
Housing Conservation and Code Enforcement		
Personal		
Salaries	\$ 24,206	\$ 268,965
Fringes	2,802	31,136
Pension	3,806	42,293
	<u>30,814</u>	<u>342,394</u>
Non-personal	<u>4,067</u>	<u>45,190</u>
	\$ 34,881	\$ 387,584
Total-Both Departments	\$ 47,391	\$ 700,071

Among the Redevelopment Agency's activities is a program involving the sealing-up of an abandoned building or demolition of privately-owned, abandoned buildings which are deemed a public hazard and which the owner will not demolish. In the City of New Haven, this program is funded with Community Development Block Grant funds. The actual seal-up or demolition of buildings is a unique program activity, or direct cost. The overhead administrative expenses are the indirect costs.

Among the buildings sealed up or demolished each year are a small number in which the Agency is responding to an emergency fire hazard order issued by the Building Department. Of the 61 buildings demolished in 1978-80, four or 7% of them were emergency fire orders. The record is less precise on seal-ups, but 7% of the 80 seal-ups is a reasonable figure for seal-up cost. The direct cost of the program is the actual demolition cost. The average cost of a seal-up is \$1000 per building and the average cost of demolition per building over the last six years was \$2,900. The unit performing this work also incurs fixed overhead costs. The seven percent figure which is emergency fire related is used to determine the fixed overhead arson cost.

To determine the indirect cost, one must know how much of total agency activity is demolition related. The seal-up and demolition unit comprises 2% of the Agency's entire budget. The applicable percentage of fixed Redevelopment Authority overhead expense is .14% (7% of 2%) of the overhead line items: executive; program administration; accounting and payroll; word processing; general services; and public information. Both the direct and indirect costs are detailed in Table IX.

Table IX
Redevelopment Agency Arson Related Costs

	<u>Arson Related</u>	<u>Total Department</u>
DIRECT COSTS		
Demolition Unit		
Direct Cost		
4 demolitions	\$ 11,600	\$ 167,000
6 seal-ups	6,000	80,000
Fixed Cost		
Personal		
Salaries	1,939	27,700
Fringes	217	3,114
Pension	<u>233</u>	<u>3,325</u>
	2,389	34,139
Non-personal		
	<u>55</u>	<u>180</u>
	20,044	281,319
INDIRECT COSTS		
Administrative Units		
Personal		
Salaries	660	471,550
Fringes	130	93,410
Pension	<u>177</u>	<u>126,800</u>
	967	691,760
Non-Personal		
	<u>388</u>	<u>276,987</u>
	1,355	968,747
Total Redevelopment Agency Costs	\$ 21,399	\$ 1,250,066

For the three departments, arson related costs total \$62,790. This figure represents 3% of the combined budget of all three agencies. The breakdown of these costs by department is summarized below.

	Arson Related	Total Department
Building Department	\$ 12,510	\$ 312,487
Housing Code Enforcement	47,391	387,584
Redevelopment Agency	15,399	1,870,137
	<u>67,790</u>	<u>1,870,137</u>

D. OTHER COSTS

There are at least two other municipal budget costs attributable to arson incidence. One is property tax revenues lost due either to a reduction in the assessed value of a property or its removal from the tax rolls. The other is an increase in a city's insurance premiums due to arson.

REAL ESTATE TAXES

Precise determination of the reduction in tax rolls due to fire related losses is an arduous process which requires tracking of every structure damaged by fire to determine whether there was a reduction in assessment or removal of property from the grand list. Two organizations have developed less arduous approaches to estimating property tax loss. One is Urban Educational Systems in Boston which has developed a computer model to estimate losses. (1) The other is a recent Baltimore study which assigns dollar values for different categories of loss. (3). Because the method of assessment varies from city to city, the assessment procedures must be examined individually to determine what approach to estimating tax losses is appropriate.

We have taken another approach. We have looked at the total structural property loss due to fire, applied the appropriate percentage (43%) for fires of suspicious or incendiary origin, and treated that amount as the real property loss due to suspicious fires. (We have excluded auto fires, a significant portion of which are incendiary or suspicious.) Under Connecticut law all real property is to be assessed at 70% of fair market value. Applying 70% to the real property loss due to incendiary and suspicious fires, we obtain the reduction in assessed values attributable to arson. To this assessed value, we apply the 65.9 mill rate in effect in FY '80 and determine the tax loss due to arson.

Total property loss due to fire	\$ 3,826,116
Loss due to arson (43%)	1,645,230
Assessed value of property lost due to arson (70%)	1,151,161
Revenue loss (assessed value @ 65.9 mils)	75,861

The City of New Haven does not levy income taxes. In those communities where other taxes in addition to real estate are levied, these tax losses must also be estimated.

FIRE INSURANCE

In addition to the insurance paid by individual home owners, a municipality pays fire insurance premiums. The City of New Haven paid \$150,000 for fire insurance in FY 1980. The insurance industry estimates that one-third of the fire insurance premiums in collects is attributable to arson. On this assumption, the arson-related cost of its fire insurance was \$50,000.

E. TOTAL MUNICIPAL ARSON COSTS

The previous sections have sought to calculate the costs of arson to the City of New Haven for the 1980 fiscal year. These costs total \$5,254,880. Table XI presents a breakdown of these costs.

Table XI
Municipal Arson Costs, Fiscal Year 1980

	<u>Arson Related</u>	<u>Total Department</u>	<u>Percent</u>
Fire Department	\$ 4,955,079	\$ 11,715,505	42.2%
Police Department	151,346	11,657,997	1.3
Building Department	12,510	312,487	4
Housing Code Enforcement	34,881	387,584	9
Redevelopment	<u>21,399</u>	1,250,000	1.3
	\$ 5,169,215	<u>25,393,639</u>	
Fire Insurance	<u>50,000</u>	<u>150,000</u>	
Property Tax Loss	<u>75,861</u>		
Total Costs	5,295,076		

IV. CONCLUSION

This study was conducted primarily to develop a methodology for calculating how much of of municipality's annual budget is attributable to arson. The goal has been to create a model which any municipality may use by specifying methods for calculating direct and indirect costs and identifying all arson-related costs, wherever they appear in the budget.

The direct costs, for specific programs to combat arson, will vary from city to city. These can readily be calculated, assuming one is careful to include applicable non-salary costs such as fringe benefits, pensions, longevity pay, materials and supplies, administrative overhead and the like.

The indirect costs will also vary, and are more difficult to calculate. For example, in some cities, the Public Works department has responsibility for picking up post-fire debris; in others, the prosecution and court disposition of arson cases are part of the municipal budget. It is critical to include every department which provides arson-related services.

For each department providing arson-related services, it is necessary to identify a unit of service delivery to make possible a calculation of how much of its activities are arson-related as compared to the departments total activities. This figure, the department's arson-related indirect cost percentage is then applied to all relevant operating and capital budget expenditures.

The authors' assumption is that in nearly every case the total proportion of the municipal budget attributable to arson will be considerably higher than is presently assumed. With this information in hand we anticipate that arson awareness will be increased and new initiatives to combat arson will be undertaken.

APPENDIX A

A METHODOLOGY FOR REPLICATION

This study sets forth a methodology for calculating the costs of arson to a municipality in budgetary terms.

The key concepts of this methodology are as follows:

Arson: fire of suspicious or incendiary origin

Costs: that proportion of a municipality's budget which is reasonably attributable to preventing, suppressing and investigating arson and eliminating its aftermath

Direct Costs: those costs which are attributable to specific anti-arson program activities

Indirect Costs: those costs, incurred in the course of a department's ongoing activities, which can reasonably be attributed to arson--calculated by applying to total department costs what we term the department's arson-related indirect cost percentage.

The basic approach for all departments engaging in arson related activities is to use an accepted measure of service delivery to determine how much of an agency's activities (e.g. police department case incidents) are arson-related, compared to total department activity, and to apply this measure--the department's arson-related indirect cost percentage--to all operating and capital expenditures of the department.

The methodology for replication of this study is outlined below.

I. Inventory of Departments

Identify every city department involved in preventing, investigating, prosecuting and suppressing arson and eliminating its aftermath (e.g. Fire Department, Police Department, District Attorney, Courts, Building Inspector, Public Works, agency responsible for demolition and seal-up of buildings.)

II. Fire Department

- A. Identify specific anti-arson programs (e.g. Arson Squad, Arson Early Warning system, etc.) and determine all costs associated with such programs, including fringe benefits, pension payments, capital expenditures, etc. These constitute direct costs.
- B. Determine number of structural fires and number and percentage of fires of suspicious or incendiary origin.
- C. Apply that percentage to the budget for all aspects of the department's activity, including fringe benefits, pension payments, administration, capital expenditures, etc. These constitute indirect costs.
- D. Add direct and indirect costs.

III. Police Department

- A. Identify specific anti-arson programs (detectives assigned to Arson Squad etc.) and determine all costs associated with such programs. These constitute direct costs.
- B. Determine what other police activities (e.g. traffic duty at fire scene, surveillance of "at-risk" buildings, etc.) are arson-related and what percentage such activities constitute relative to total department activity. For this purpose, an existing unit of service--often termed a case incident in police usage--is essential.

- C. Apply that percentage to all costs associated with such activities.
These constitute indirect costs.

- D. Add direct and indirect costs.

IV. Inspection Costs

- A. Determine which department or departments are responsible for inspections of buildings which have experienced fires of incendiary or suspicious origin.
- B. For each department, determine what proportion of the total number of inspections were of buildings which have experienced such fires.
- C. Apply the appropriate figure--the department's arson-related indirect cost percentage--to all departmental costs.

V. Demolition Costs

- A. Determine which department is responsible for demolition of vacant buildings.
- B. Determine what number of demolitions were of buildings which have experienced fires of incendiary or suspicious origin, or have been identified as buildings "at risk" of arson.
- C. Determine the average demolition cost per building and multiply by the numbers derived in B, above.
- D. Deduct any amount collected by the city due to demolition liens to determine the net direct cost of demolition.
- E. Determine the percentage of demolitions of buildings which have experienced suspicious or incendiary fires, or identified as buildings "at risk" of arson, relative to the total number of buildings demolished.
- F. Apply this percentage to all department costs.
- G. Add together direct and indirect costs.

VI. Seal-up Costs

Follow the procedure set forth for demolition costs.

VII. Other Departments

Apply comparable methods to other departments identified as having arson-related activities (Public Works, District Attorney, etc.) including direct anti-arson activities and that part of the departments total activities relating to the prevention, investigation and suppression of arson and elimination of its aftermath.

VIII. Lost Revenues

A. Determine value of all property destroyed by fire in the year in question (usually included in Fire Department Annual Report).

B. Apply to property loss figure the percentage of structural fires due to suspicious or incendiary origin to determine value of property lost due to arson.

C. Determine assessed value of such property by applying statutory percentage.

D. Apply the tax rate to the assessed value of property lost due to arson.

IX. Fire Insurance

A. Determine amount of fire insurance premiums paid by city for the year in question.

B. Apply insurance industry estimate of percentage of premium attributable to arson to the city's total fire insurance premiums.

X. Total Cost of Arson

Add the figures produced in steps II through IX.

FOOTNOTES

- (1) For further information of this model, contact Mr. David Scondras, Urban Educational Systems, Boston, Massachusetts
- (2) Munson, Michael J. and Ohls, James C., INDIRECT COSTS OF RESIDENTIAL FIRES, prepared for the Federal Emergency Management Agency, United States Fire Administration, July, 1979.
- (3) Goodman, Allen; Murray, Maureen; unpublished study, THE COSTS OF ARSON TO BALTIMORE CITY.

