

## **Income and Expense Data for Canadian Multi-unit Residential Buildings**

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**FINAL REPORT**

## **DISCLAIMER**

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## Summary

A pilot study developed a methodology for gathering data on the factors influencing the financial performance of Canadian multi-unit residential buildings. The Real Estate Institute of Canada (REIC), the Building Owners and Managers Association (BOMA) and the Fair Rental Housing Policy Organization of Ontario (FRHPO) asked their members for operating data. A total of 96 useable surveys were completed, representing 15,507 residential units, or just under 0.5% of all Canadian private rental and condominium stock.

There is very little publicly available data about the characteristics of multi-unit buildings in Canada. The limited amount of data from industry and Statistics Canada indicates that the pilot survey responses indicates that they are very similar to the universe of Canadian multi-unit stock. It is thus very likely that this sample is adequate to assess the requirements of work designed to accurately develop estimates of the financial performance of these buildings and to determine factors significantly affecting their performance. For example, using estimates based upon these responses, a random sample of 5,000 multi-unit buildings would very likely be adequate to yield good estimates of most average revenue and expenditure items at a regional level for varying building types.

It was noted that: the average maintenance expenditures noted are similar to those reported for federally administered social housing. It was further postulated that there are the following industry sub-groups (type of operation):

- ♦ **Family townhouse** which provide larger units with exterior parking and higher than average water/sewage and property tax expenditures;
- ♦ **Amenity rich operations** with enclosed parking, which generate high rental revenue but require high expenditures for insurance, repairs and maintenance;
- ♦ **High rise buildings** which have higher personnel and utility costs, provide ancillary services, and generate more miscellaneous, non-rent revenue; and
- ♦ **Condominium Operations** which have high per unit expenditures for recreational and amenity related facilities but, reflecting the individual responsibilities of residents, low heating and insurance costs.

It was further noted that:

- ♦ Almost 70% of the differences in per unit revenues could be attributed to building type, region, type of operation, average unit size and level of service provided, and
- ♦ Over a third of differences in per unit maintenance costs could be attributed to type of operation, heating system, and the level of amenities provided.

Wayne Webster  
February 1997

## Résumé

Une étude pilote a permis d'élaborer une méthodologie pour recueillir des données sur les facteurs influant sur le rendement financier des collectifs d'habitation au Canada. L'Institut canadien de l'immeuble (ICI), la Building Owners and Mortgage Association (BOMA) et la Fair Rental Housing Policy Organization of Ontario (FRHPO) ont demandé à leurs membres de leur fournir des données sur l'exploitation des collectifs d'habitation. En tout, on a effectué 96 études utilisables regroupant 15 507 logements résidentiels ou un peu moins de 0,5 % de tous les logements locatifs privés et en copropriété au Canada.

On ne trouve pas beaucoup de données publiques sur les caractéristiques des collectifs d'habitation au Canada. Le peu de données obtenues du secteur de l'habitation et de Statistique Canada permet de constater une étroite similarité entre les résultats de la présente étude et l'ensemble du parc des collectifs d'habitation au pays. Il est donc probable que l'on puisse se baser sur l'échantillon pour évaluer les exigences du travail requis dans le but d'élaborer le rendement financier approximatif de ces collectifs et de déterminer les facteurs qui ont une incidence significative sur ce rendement. Par exemple, en utilisant des estimations basées sur ces résultats, on pourrait sans doute, à l'aide d'un échantillon aléatoire de 5 000 collectifs, fournir des estimations relativement justes de la plupart des revenus et dépenses au niveau régional pour divers types d'habitations.

On a remarqué que les dépenses moyennes d'entretien sont semblables à celles engagées pour le logement social administré par le gouvernement fédéral. On a ensuite établi les sous-groupes (type d'exploitation) suivants :

- **Maisons en rangée** qui offrent des logements plus grands et un stationnement extérieur, et dont les frais d'eau, d'égout et les taxes municipales sont supérieurs à la moyenne.
- **Installations à usage collectif** qui ont des stationnements intérieurs, des revenus de location élevés mais dont les frais en matière d'assurance, de réparation et d'entretien sont importants.
- **Tours d'habitation** dans lesquelles les coûts en personnel et en services publics sont plus élevés et qui offrent des services auxiliaires et génèrent davantage de revenus divers non liés aux loyers.
- **Copropriétés** qui donnent lieu à des dépenses élevées par logement pour les installations récréatives et les aménagements, mais dont les coûts de chauffage et d'assurance sont plus bas (responsabilité des résidents).

On a de plus remarqué que :

- Presque 70 % des écarts de revenu par logement pourraient être attribués au genre d'habitation, à la région, au type d'exploitation, à la grandeur moyenne des logements et au niveau de service offert.

- Plus d'un tiers des écarts de coûts d'entretien par logement pourrait être attribué au type d'exploitation immobilière, au système de chauffage et aux aménagements fournis.

Wayne Webster  
Février 1997



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## **I. Overview**

This report reviews and analyses the data collected in the pilot survey of rental property income and expenses undertaken in 1994 by the research division of CMHC. Specifically, it:

- provides an overview of the building and cost characteristics of the sample data collected to date and makes comparisons with a similar survey of U.S. rental property;
- examines possible underlying inter-relationships among these data;
- uses the data to model a set of relationships between cost and operating/building characteristics; and
- makes recommendations concerning sampling methodology and questionnaire content of potential future work.

## **II. Characteristics of the Sample**

Between 1994 and 1996, the Real Estate Institute of Canada (REIC) and the Building Owners and Managers Association (BOMA) and the Fair Rental Housing Policy Organization of Ontario (FRHPO) distributed the survey questionnaire (See Appendix I) to their members. The questionnaires concern financial operating results and related building characteristics of rental properties with at least 8 residential units. Financial operating results pertain to fiscal periods which occurred between the years 1991 and 1994. In total, 100 surveys were completed in the survey, of which 96 provided usable information.

### **a. Project Characteristics**

Table 1 provides a summary of locational, building and unit characteristics of the projects surveyed.

Projects reporting were concentrated in British Columbia and the Maritimes with very few projects from Québec. A minority of projects (39%) surveyed were in provinces where rent control was in effect at the time of the survey.

Projects sampled tend to be located in large urban areas, "averaging" just under 400,000 households (a total population of just over 1,000,000). Only one project was located in an area containing under 2,000 households (a total population of approximately 5,000) while a large majority (64%) were found in communities containing over 200,000 households.

The majority of projects in the sample are elevated buildings (55%). Another 29% of the projects are low-rise buildings, while less than 16% were identified as townhouses.

Projects varied in size considerably, ranging from 8 to 4,375 units, and averaged 162 units. Total gross building areas ranged between 293 and 191,300 square metres of space, with the average project containing buildings with a gross area of 33,784 square metres. Net rentable areas averaged about two-thirds of gross.<sup>1</sup>

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<sup>1</sup> This statistic is based on the 45% of the respondents who provided both gross building area and net rentable area.

**Table 1  
Project Characteristics**

Characteristic	# Reporting	Mean /Proportion	Standard Deviation	Minimum	Maximum
<b>Region</b>	96				
Maritimes	20	21%			
Québec	2	2%			
Ontario	16	17%			
Manitoba/Saskatchewan	14	15%			
Alberta	11	11%			
British Columbia	31	32%			
Yukon/N.W.T.	2	2%			
<b>Surrounding Community Size (# of Households)</b>	96	395,461	355,749	992	1,329,083
<2000	1	1%			
2000-199,999	33	32%			
>200,000	62	67%			
<b>Project Size</b>					
Gross Build. Floor Area (m <sup>2</sup> )	45	20,911	32,579	293	191,300
Net Res. Rentable Area (m <sup>2</sup> )	71	14,282	47,178	249	390,821
Number of Residential Units	96	162	462	8	4,375
<b>Type of Operation</b>	96				
Private Rental	75	78%			
Condominium	13	14%			
Social Housing	8	8%			
<b>Building Style</b>	96				
Townhouse	15	16%			
Low-Rise	28	29%			
Elevator	53	55%			
<b>Projects Reporting Type of Unit</b>	88				
Bachelors	47	53%	25%	0%	100%
1 Bedroom	71	81%	32%	0%	100%
2 Bedroom	74	84%	30%	0%	100%
3 Bedroom	23	26%	15%	0%	100%
4 Bedroom +	3	3%	1%	0%	10%
Non-residential Occupancy	2	2%	2%	0%	26%
<b>Parking</b>	96				
# Reporting Any Parking	92	96%	44%	0	2
# Reporting Enclosed Spaces	54	56%	46%	0	100%
Age of Project (in years)	89	24	14	0	69
<b>Heat/Energy Source</b>	89				
Gas	53	60%			
Oil	10	11%			
Electricity	26	29%			

Responses indicated quite a varied mix of unit sizes. A very large proportions of the projects, though, contained at least some one bedroom units (81%) and two bedroom units (84%).

Projects were primarily located in private, non-subsidized rental buildings (78%). An additional 14% are condominium. The remaining 8% are social housing (co-op, supply subsidy, rental subsidy, public ownership).

Very few (2%) of projects report space that is leased for retail/commercial purposes or for other non-residential functions.

The great majority of projects provided parking for tenants (96%), although the number of spaces per tenant varied considerably--from none to more than two. A smaller majority had enclosed parking areas (56%). In most of these cases, only part of the available parking was enclosed.

The average age of projects sampled was 24 years in 1994. These buildings are thus somewhat older, on average, than either owner occupied dwellings in Canada (approximately 18 years) (derived from Statistics Canada (1994b)) or Canada's social housing stock (12 years) (Spector (1996)).

Natural gas was the fuel used for space heating in most projects (60%). Electricity was used by 29% and oil by 11%. This may reflect the sample bias toward the western provinces where gas is predominantly the fuel of choice in rental accommodations (see CMHC (1992a), Table 68).

#### b. Unit Characteristics

Table 2 provides various characteristics of the sample on a per unit basis.<sup>2</sup> In also indicates, where possible, comparisons to the universe of all Canadian rental units.

Survey responses include 15,507 dwelling units, approximately .4% of all rental and condominium units in Canada in 1994.<sup>3</sup> Table 2 indicates that the sample of units is very heavily drawn from stock located in Alberta, largely reflecting the inclusion of large projects there. The survey captured just under 2% (6,603 units of the approximately 350,000<sup>4</sup>) rental and

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<sup>2</sup> Some caution should be exercised in viewing these results because they are highly influence by the presence of a few, very large projects in this sample.

<sup>3</sup> Estimates of the count and proportion of various characteristics of rental and condominium stock shown in Table 2 were developed from the 1991 Census and the 1994 HIFE (Statistics Canada (1995), Tables 3 and 5 and (Statistics Canada (1993)). This and other comparisons with the universe of all rental units are limited because:

While estimates exist in the census of the total number of dwellings, including those which are unoccupied, no estimate is available by tenure. This estimate of total rental units was made under the assumption that there was no difference in the proportion vacant units by tenure; and

The sample is restricted to properties containing 8 rental units or more, but comparisons are made with all rental units. No estimates are available of the number or characteristics of rental units making up this part of the rental unit universe.

<sup>4</sup> Total rental and condominium stock is estimated using Statistics Canada (1993a and 1995), and CMHC (1995).

**Table 2  
Dwelling Unit Characteristics**

Characteristic	# of Units Sampled	Mean or Proportion	All Rental Units in Canada	% of Total Stock Sampled
<b>Region</b>	15,507		4,356,140	0.4%
Maritimes	1,693	11%	4%	0.7%
Québec	787	5%	31%	<.1%
Ontario	3306	21%	35%	0.2%
Manitoba/Saskatchewan	1,616	10%	6%	0.6%
Alberta	6,603	43%	9%	1.5%
British Columbia	1,417	9%	12%	0.3%
Yukon/N.W.T.	85	1%	<1%	0.5%
<b># of Households in Surrounding Community</b>	15,507			
<1000	30	<1%	9%	<.1%
1000-199,999	2,734	18%	37%	.2%
>200,000	12,763	82%	54%	.5%
<b>Type of Operation</b>	15,507			
Private Rental	13,000	84%	77%	.3%
Condominium	1,708	11%	9%	.4%
Social Housing	799	5%	15%	.1%
<b>Building Style</b>	15,507			
Townhouse	5,641	36%	36%	0%
Low-Rise	2,233	14%	43%	0%
Elevator	7,633	49%	21%	1%
<b>Unit Characteristics</b>	15,113			
% Bachelors	1,507	10%	6%	0%
% 1 Bedroom	4,566	30%	32%	0%
% 2 Bedroom	5,665	37%	37%	0%
% 3 Bedroom	3,091	20%	20%	0%
% 4 Bedroom +	294	2%	5%	0%
Average Unit Size (m <sup>2</sup> )	12,872	78.8	Not Avail.	Not Applic.
<b>Parking</b>	15,507			
Spaces/Residential Unit	15,420	1.01	Not Avail.	Not Applic.
% in Enclosed Spaces	15,301	39%	Not Avail.	Not Applic.
Average Age (in years)	15,090	24.5	28.5	Not Applic.
Heating included in Rent	15,341	88%	Not Avail.	Not Applic.
Electricity included in Rent	15,507	48%	Not Avail.	Not Applic.
Turnover	13,512	32%	25%-35%	Not Applic.

condominium stock in that province. At the other end of the spectrum, in Québec, surveys were completed for projects representing only .1% of the total stock. More generally, responses more heavily represent stock in the Maritimes, the three Prairie Provinces and the Territories and under-represent stock in central Canada (especially Québec) and British Columbia.

Most units surveyed are located in larger Canadian cities. While the majority of rental accommodations are also located here, rental units located there were significantly over represented. This may, in part, be a reflection of the restriction of the survey to projects of 8 or more units, since project size is highly related to size of urban area (Spector (1996), pp. 89).

As is the case for the stock as a whole, the great majority of units are private rental. These are slightly over-represented in the sample, while social housing is under-represented.<sup>5</sup>

The distribution of units by unit size is remarkably close to that existing in the stock as a whole, although bachelors are slightly over represented and 4+ bedroom units are under-represented.<sup>6</sup> As in the population as a whole, the largest number of units having two bedrooms, followed closely by 1 bedroom units. On average, units contained 78.8 square metres or just under 850 square feet of living space.

On average, there was a one-to-one relationship between units and available parking, with 39% of parking spaces being located in enclosed spaces. As noted in the last section, the availability of parking varies considerably across projects.

Heating costs were included in rent for 88% of the units reporting in the sample. In 48% of the units, electricity was included in rent.

Units sampled averaged just under 25 years in age--slightly younger than the average of 28.5 years for all occupied rental units.

Average annual unit turnover was 32%--in line with mobility rates for Canadian renters--which varied from 25% to 35% over the period (1991-1994) (derived using Statistics Canada (1992) and (1994a)).

In summary, in most regards, the rental units sampled are a fair reflection of overall characteristics of the Canadian rental housing market, although they under-represent central Canada, and tend to over-represent large population areas. Because western Canada is particularly well represented, and relatively cheap natural gas is the dominant heating fuel, it is

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<sup>5</sup> This comparison is developed by using the census estimates of total rental and condominium units and Federal funded and Ontario unilaterally funded public and non-profit rental and co-op stock in 1992 located off of Indian reserves (CMHC 1992) and (Ontario (1994)).

<sup>6</sup> This may reflect a concentration of smaller units in larger cities and projects (see Spector (1996), pp. 89).

likely that heating costs are relatively low. Because rents tend to increase with population size<sup>7</sup>, average rent per unit is likely higher than in the universe of all rental properties.

### c. Revenues and Expenditures<sup>8</sup>

Table 3 provides summary statistics of per unit revenues and costs from the full sample. For all but three revenue and expenditure items, at least three quarters of respondents indicated some expenditure.<sup>9</sup> In contrast, less than 20% of responses indicate "Other Gas/Oil", "Recreational Amenities" and "Non-recurring" expenditures. The large standard deviations and wide ranges between minimum and maximum per unit values, indicate that expenditure levels varied considerably among participants.

Table 3 shows that average total gross potential revenues was \$6,918. Potential 1994 rent revenue was \$527 per month, remarkably close to the estimated average rent paid by tenants in Canada for that year of approximately \$526.<sup>10</sup> Of this vacancy loss/Incentives and other losses resulted in net rental revenues that were 5% lower (\$412 or \$34 per unit per month). Given an average vacancy rate of 4.7% in Canadian rental properties with more than 5 units during 1992 and 1993 (CMHC (1994)), these data are likely in line with the overall market. Miscellaneous revenue added an additional an average 4% to revenue (\$341 or \$28 per month) to the average revenue generated per unit.

Overall, operating expenditures (excluding mortgage amortization and depreciation) averaged \$3,759 per unit (\$313 per month). The largest expenditure components were property taxes (28%), utilities (27%) and maintenance costs (19%).<sup>11</sup> Salaries and personnel expenditures averaged 11%, contracted Services made up 9% of costs, management services 7% and administrative costs 4%.<sup>12</sup>

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<sup>7</sup> See, for example, Statistics Canada (1993b).

<sup>8</sup> Either one or two fiscal years of revenue and expenditure data for periods between 1992 and 1995 were collected from each respondent. To allow for comparisons, these data are indexed to 1994 using the Canada Consumer price index and averaged, and thus should be considered to represent a January 1 to December 31, 1994 fiscal year. The choice of the Canada CPI is based on results of correlating various available indices with a series of twenty years of public housing maintenance and capital expenditures. (see Spector (1996)).

<sup>9</sup> The high proportion of the sample indicating expenditures on Management fees be an artifact of data collection of data centred upon BOMA, which includes a significant number of professional building managers.

<sup>10</sup> This estimate is modified from Statistics Canada's 1994 HIFE published data (Household Incomes Facilities and Equipment) to include rental properties in the Territories (Statistics Canada (1995)). Territories rents were taken from the 1991 census (Statistics Canada (1993a)), and indexed using the Yellowknife and Whitehorse CPI's (Statistics Canada (1996)).

<sup>11</sup> Tables 3, 4, and 5 follow the Institute of Real Estate Management convention of reporting revenue and expenditures statistics for non-zero items only (see for example, IREM (1995)). As a result, revenue and expenditure subcategory sums do not necessarily add to totals and percentages do not necessarily add to 100%.

<sup>12</sup> Management fees and contracted Services may include significant portions of maintenance and administrative costs. Further the interpretation of salary and personnel costs are limited by the inclusion of these costs as part of some other categories (administration and advertising, recreational services and some "other costs").

**Table 3**  
**1994 Per Unit Annual Revenue and Expenditure Statistics<sup>11,13</sup>**

Revenue/Cost Category	Units (Projects) Reporting	Mean	Standard Deviation	Minimum	Maximum	% of Average Gross Pot. Rev.
<b>Revenues</b>						
Gross Potential Revenue	13,139 (79)	\$ 6,918	\$ 2,997	\$ 2,055	\$ 17,087	Not Applic.
Actual Revenue	15,507(96)	\$ 6,293	\$ 2,854	\$ 2,055	\$ 17,087	96%
Rental Revenue	15,507 (96)	\$ 5,964	\$ 2,792	\$ 1,993	\$ 16,908	91%
Vac./Incentive/Other Losses	13,139 (79)	\$ (412)	\$ 497	\$ (3)	\$ (1,587)	5%
Miscellaneous Revenue	14,996 (88)	\$ 340	\$ 438	\$ 4	\$ 2,418	4%
<b>Expenditures</b>						% Average Expenditures
Total Operating Expenditures	15,507 (96)	\$ 3,759	\$ 1,380	\$ 1,211	\$ 8,877	Not Applic.
Salaries and Personnel Costs	15,233 (87)	\$ 406	\$ 245	\$ 63	\$ 1,233	11%
Utilities Total	15,454 (94)	\$ 987	\$ 436	\$ 3	\$ 2,148	27%
Heating	15,241 (90)	\$ 434	\$ 240	\$ 13	\$ 1,208	12%
Electricity (non-heating)	15,039 (87)	\$ 305	\$ 259	\$ 4	\$ 951	8%
Water and Sewer	14,264 (80)	\$ 276	\$ 172	\$ 3	\$ 760	8%
Other Gas/Oil	789 (4)	\$ 157	\$ 42	\$ 97	\$ 201	4%
Management Fees	7,875 (75)	\$ 301	\$ 99	\$ 145	\$ 884	9%
Administration and Advertising	14,978 (88)	\$ 132	\$ 128	\$ 2	\$ 456	4%
Repair and Maintenance	15,387 (95)	\$ 677	\$ 426	\$ 55	\$ 3,792	19%
Contract Services	8,937 (73)	\$ 307	\$ 265	\$ 37	\$ 2,706	7%
Insurance	14,484 (81)	\$ 38	\$ 23	\$ 2	\$ 214	1%
Property and other Taxes	14,200 (87)	\$ 1,080	\$ 684	\$ 1	\$ 3,244	28%
Recreational/Amenities	3,849(17)	\$ 74	\$ 136	\$ 11	\$ 1,381	2%
Other	12,388 (73)	\$ 256	\$ 417	\$ 3	\$ 3,339	6%
Non-recurring Expenditures	2,437 (19)	\$ 217	\$ 645	\$ 7	\$ 5,392	

Comparisons of some revenues and expenditures are possible between the private rental properties included in this survey and Canadian properties which make up part of the annual survey published by the U.S. based Institute of Real Estate management (IREM). Table 4 provides per unit comparisons for 75 private rental buildings surveyed here and the 65 Canadian buildings (6,500 units) in the 1995 IREM survey where revenue/expense categories are

<sup>13</sup> These data exclude mortgage, amortization and property related depreciation expenses.

comparable.<sup>14,15</sup> It shows that actual revenues (total gross revenue minus vacancy and other losses) are within 3% but that respondents' operating expenses are 9% higher. A large part of this difference is due to a larger proportion of sampled results having heat included in rent (83% versus 51%). Another very significant difference occurs in expenditures on heating when included in rent and in water/sewer expenditures. These differences may be due to:

Revenue/Cost Category	Properties (Units) Reporting	Mean	Properties (Units) Reporting <sup>16</sup>	Estimated Mean <sup>17</sup>	Difference
Actual Revenue <sup>18</sup>	75 (13,000)	\$ 6,475	65 (6,500)	\$ 6,316	\$ 169
Total Operating Expenditures	75 (13,000)	\$ 3,701	65 (6,500)	\$ 3,394	\$ 307
Management Fees	61 (7,803)	\$ 280	56	\$ 293	\$ (13)
Heat (When included in rent)	61 (11,879)	\$ 461	33	\$ 315	\$ 146
Electricity (When included in rent)	29 (5,642)	\$ 413	33	\$ 378	\$ 35
Electricity (Common area only)	39 (7,022)	\$ 125	31	\$ 140	\$ 15
Water and Sewage	66 (12,033)	\$ 289	64	\$ 161	\$ 128
Insurance	68 (12,597)	\$ 38	55	\$ 42	\$(4)
Property and other Taxes	69 (12,777)	\$ 1,106	65	\$ 1,080	\$ 26

a relatively high proportion of electrically heated buildings and units in this sample;

<sup>14</sup> The Institute of Real Estate Management's *Income/Expense Analysis--Conventional Apartments* reports median revenues and expenditures rather than mean for classes of rental properties. All else being equal, it is expected that these results will be slightly lower than the mean statistics provided in this report (see Table 4). This is because revenue and expenditure distributions tend to have "right skews"--that is there is a wide range of rents and expenditures at the "high end". On the revenue side, this can be seen, for example in examining the distribution of rents paid by tenants after controlling for unit size reported in the 1991 census (developed using Statistics Canada (1994b)). On the cost side, for example, Spector (1996), pp. 85-86 shows a marked right skew in the distribution of annual maintenance expenditures in social housing.

<sup>15</sup> In comparison to units in the buildings surveyed here, units in the IREM sample are very heavily concentrated in Manitoba (53% versus 3%).

<sup>16</sup> No "units reporting" is provided here for some expenditure categories because using this source, total units cannot be determined when all respondents did not report an expenditure.

<sup>17</sup> IREM (1995) provides median statistics by city and unit type but no overall statistic for Canada. The estimated mean for Canada was estimated from the source by using the weighted average (of the number of units for each city/unit type category) of these statistics. The use of such a procedure leads to a statistic which usually converges on the population mean (see Wilks (1947), ch. 4).

<sup>18</sup> IREM published results provide data on total net rental revenue, which is there defined as gross potential revenue plus miscellaneous revenue minus vacancy/incentives/other losses.

- a higher proportion of town houses in the sample where heating costs and water/sewer expenses tend to be higher (see page 11-12 below);
- a greater geographic range in this survey and high regional variations in water/sewer expenses and property taxes.

At the same time, expenditures for insurance, property taxes and electricity (controlling for whether or not it was included in rent) are remarkably close. Table 5 provides a fuller breakdown of all costs for private rental respondents.<sup>19</sup>

Revenue/Cost Category	Units (Projects) Reporting	Mean	Standard Deviation	% of Average Gross Pot. Revenue
<b>Revenues</b>				
Gross Potential Revenue	13,000 (75)	\$ 6,867	\$ 3,079	Not. Applic.
<b>Actual Revenue</b>				
Rental Revenue	13,000 (75)	\$ 6,208	\$ 2,826	91%
Vacancy/Incentives/Other Losses	12,159 (65)	\$(396)	\$ 489	5%
Miscellaneous Revenue	12,651 (70)	\$ 286	\$ 290	4%
<b>Expenditures</b>				<b>% Average Expenditures</b>
Total Operating Expenditures	13,000 (75)	\$ 3,701	\$ 1,475	
Salaries and Personnel Costs	12,738 (68)	\$ 374	\$ 212	10%
Utilities Total	12,959 (74)	\$ 962	\$ 375	27%
Heating	12,866 (71)	\$ 436	\$ 233	12%
Electricity (non-heating)	12,664 (68)	\$ 262	\$ 222	7%
Water and Sewer	12,033 (66)	\$ 289	\$ 176	9%
Other Gas/Oil	309 (2)	\$ 131	\$ 12	3%
Management Fees	5,844 (59)	\$ 307	\$ 103	9%
Administration and Advertising	12,471 (67)	\$ 122	\$ 128	4%
Repair and Maintenance	12,880 (74)	\$ 673	\$ 394	19%
Contract Services	7,803 (61)	\$ 280	\$ 253	7%
Insurance	12,597 (68)	\$ 38	\$ 23	1%
Property and other Taxes	12,777 (69)	\$ 1,106	\$ 709	29%
Recreational/Amenities	2,886 (12)	\$ 45	\$ 41	1%
Other	10,437 (55)	\$ 187	\$ 311	4%
Non-recurring Expenditures	1,465 (15)	\$ 219	\$ 829	

<sup>19</sup> Tables for condominiums and social housing are not provided because sample size is inadequate to provide reasonably reliable average expenditure estimates..

### III. Relationships between Project and Unit Characteristic and Financial Performance

#### a. Underlying "Factors"

To provide some indication of the underlying structure of the data collected at the property level, a principal components factor analysis was used.<sup>20,21</sup> This analysis indicates where there are distinct patterns of highly inter-related cost and operating/building characteristics and groups of buildings which all follow these patterns well. Each of these distinct patterns is characterized by a "factor" in this procedure. Buildings with a high "factor scores" for each factor fit the factor well.

Patterns of relationships are identified through the use of **factor loadings**. These factor loadings vary between -1 and 1 and indicate strengths of relationships or "correlations" between cost and operating/building characteristics and factors. Loadings close to 1 indicate strong, positive relationships (i.e. when a characteristic is present or increases, so too does the value of the underlying "factor"), values close to -1 indicate a strong inverse relationships. Conversely, loadings close to 0 indicate that there is no relationship between the factor and the characteristic. In the results provided below, factor loadings "higher" than approximately +/- .4 are reported and used in interpreting factors. Sometimes, factors too can be related. As a result, correlations between factors are also produced and some discussion is provided below regarding these.

Factor scores indicating how well projects fit these factors or "stereotypes" were also calculated. These scores are standardized variables (with a mean or "neutral point" of 0 and a variance of 1). Where a factor score is positive and "high" (different from the neutral point, with a reasonable level of statistical confidence)<sup>22</sup>, a project can be said to fit the "stereotype" well (i.e. have many of these characteristics). A "high" negative score indicates that the project very likely fits the converse of the stereotype. Below, numbers and proportions of projects with "high" positive and negative factor scores are reported for each factor.

A total of 4 prominent factors were identified, using 31 nominal or continuous variables in the data set. These 4 factors characterize 35% of the total variation in the original variables.<sup>23</sup> All four factors provide interesting insights into the underlying structure of these survey data:

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<sup>20</sup> For a simple introduction to this methodology, see Rummel (1970).

<sup>21</sup> Formally, the data was subject to a principal components factor analysis and the factors extracted were rotated to a best fitting "OBLIMIN" solution. The number of factors was determined using the "scree" method--where a significant downturn is observed in the "explanatory" power of the factors identified. The "OBLIMIN" solution maximizes the number of high and low factor loadings, while usually allowing moderate amounts of correlation between factors.

<sup>22</sup> in this case a score of +/-1.28 was signified as "high". This score is different from zero with a 80% probability.

<sup>23</sup> Using the methodology adopted here, if the original variables were completely uncorrelated, new variables could not be developed, since they would characterize 0% of the total variation of the original characteristics.

**Factor I--Amenity rich/amenity poor buildings:** This factor has a set of factor loadings which indicate amenity rich buildings which also tend to be located in larger urban areas, primarily in British Columbia. Here, rent revenue is high, and so too are repair and maintenance and insurance expenditures--indicating a high level of service, possibly a high average per unit asset value and an enclosed garage. These buildings also tend to have high levels of management fees and contract services. On top of higher than average rents, residents are likely to be paying their own utility bills. A total of 10% of buildings sampled strongly showed these characteristics, while another 7% strongly showed their converse (i.e. low rental revenue, low maintenance expenditures etc.).

<i>FACTOR I: "Luxury" Buildings</i>	
<u>Variable</u>	<u>Factor Loading</u>
Rental Revenue	.770
Location: British Columbia	.748
Management Fee Expenditures	.640
Electricity <u>not</u> included in rent	.597
Percent of Parking Spaces in Enclosed Garage	.583
Repair and Maintenance Expenditures	.564
Contracted Services Expenditures	.541
Insurance Expenditures	.502
Large Population	.474

**Factor II--Condominiums:** These projects are very likely to be condominiums and tend to have large expenditures on recreational and amenity related facilities. Unit heating and insurance is often not included in condominium charges, and thus expenditures in this area tend to be lower than in other properties. Finally, the fuel of choice in heating is gas or oil rather than electricity. Most condominiums included (9 of 13) scored highly on this factor. In contrast, a single building had a high "negative" score.

<i>Factor II: "Condo's"</i>	
<u>Variable</u>	<u>Factor Loading</u>
Condominium	.710
Heat not included in rent	.668
Recreational Amenity Expenditures	.591
Other Expenditures	.571
Heating Fuel: Gas/Oil	.461
Utilities Expenditures: Heating	-.461
Insurance Expenditures	-.380

**Factor III--Larger, family town house units:** These projects are more likely to have 3 or more bedrooms, larger living areas and a larger number of parking spaces per unit. Rents, on average, tend to be higher, but these are offset by higher water/sewage and property/other tax expenditures. It is likely that a significant number of families reside in these units. In total, 10

of 15 townhouse projects scored highly on this factor. Conversely, 8 other projects, primarily low rise buildings with large numbers of bachelor/one bedroom units and little or no parking had high negative scores on this factor.

<i>Factor III: "Family Town house"</i>	
<u>Variable</u>	<u>Factor Loading</u>
Average Unit Size	.644
Parking Spaces Per Unit	.516
3+ Bedrooms	.516
Property and Other Tax Expenditures	.514
Water and Sewage Expenditures	.493
Townhouse unit	.434
Age of Project	.389
Average Rent Revenue	.376

**Factor IV--"high rise" buildings:** Buildings loadings highly on this factor are very likely to have elevators. These buildings also tend to have heating included in rent and as a result, have high electricity costs. Miscellaneous revenues are high (likely reflecting charges for parking and laundry facilities). Unlike luxury building, a high proportion of parking is likely to be in open lots. Finally, salaries and personnel expenditures tend to be high on a per unit basis. In total 9% of projects fit this stereotype well, while another 3%, primarily townhouse projects, fell at the opposite end of the spectrum.

<i>Factor IV: "High Rise"</i>	
<u>Variable</u>	<u>Factor Loading</u>
Miscellaneous Revenue	.726
Elevated Building	.626
Electricity (non-heating)	.559
Salaries and Personnel Expenditures	.440
Percent of Parking Spaces Not in Enclosed Garage	.379
Electricity included in rent	.360

There are small, but significant correlations between factors II, III and IV that simply indicate, that condominiums are slightly more likely to be highrise buildings, rather than town/row house developments.

Some building and expenditure characteristics did not play a part in developing these broad stereotypes in the sample. In particular, turnover, vacancy loss and administrative/advertising costs were not highly linked to other building characteristics. There were, though, a few of buildings where concurrently, there was higher than average turnover, vacancy loss and administrative/advertising costs. Further, non-recurring expenditures was not strongly linked with these factors.

In summary, significant clusters of respondents could be strongly stereotyped as either "luxury buildings", "condominiums", "family/townhouses" or "high rises". Each of these groups had a number of other, related characteristics.

## **b. Revenue/Cost Relationship**

The relationships between various revenues and expenditure and property characteristics were explored using multivariate analysis of variance/covariance techniques (MANOVA). Models were developed for annual total net rental revenue, total utility costs, administration and advertising and maintenance and repairs. Results presented were chosen by selecting explanatory variables from a series of hypothesized relationships which parsimoniously "explained" significant amounts of these elements of cost.<sup>24</sup>

### **1. Total Actual Revenue**

It was expected that actual rental revenue would be related to a number of characteristics of the property, and given the factor analysis results above, would also be partially "explained" by expenditures in certain cost categories.

Initially actual revenue was expected to be:

Positively related to:

- average unit size
- the inclusion of electric and heating costs
- the presence of gas or oil heating (where heating costs were excluded from rent)<sup>25</sup>
- townhouse units
- private rental buildings versus social housing (because for the most part, revenue came directly from tenants rather than through subsidy payments)
- low levels of turnover (although high turnover may be a reflection of relatively high rents in a given market place)
- high levels of maintenance; management fees; contracted fees and recreational fee expenditures (reflecting level of upkeep and service provided in the building)
- high levels of insurance expenditures (related to the net worth of the building)
- high levels of expenditures on recreational amenities
- provision of furnished units
- urban size
- area of the country (rents tend to be particularly high in urban areas in the Territories and in British Columbia and Ontario (see for example, Statistics Canada (1993a)) and

Negatively related to:

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<sup>24</sup> Here and below, unless otherwise stated, only variables which are estimated to have an independent effect (i.e. given the inclusion of the other variables in the equation) on the dependent variable are included which are significantly different from null with 95% confidence.

<sup>25</sup> Tenants would be expected to "bid" more for these units when they were responsible for paying for heating.

- age of building (newer buildings being relatively attractive)
- presence of rent control

The resultant parsimonious model summarized below characterized an estimated 69% of the total variations in actual revenue in the sample projects:

Actual Revenue =	\$6682	
+ {Building Style:	+ \$87 if	Elevated
	-1231	Low Rise
	+ 594	Townhouse) <sup>26</sup>
+ {Operation Type:	+ \$716	if Private Rental
	+1108	Condominium
	-1824	Social Housing) <sup>27</sup>
+ {Region:	-\$2490 if in	The Prairies (Manitoba, Saskatchewan, Alberta)
	- 994	Another Prov. (Maritimes, Québec, Ontario, B.C.)
	+3485	The Territories) <sup>28</sup>
+	\$6.95	per square metre of unit size
+	\$3.28	per dollar of management fees expenditures
-	\$0.76	per dollar of maintenance/repair expenditures
+	\$1.51	per dollar of contracted services <sup>29</sup>
+	\$0.14	per percent of turnover

The results indicate that low rise buildings are particularly likely to be "low rent" buildings. Further, private rental and, surprisingly, condominiums tend to generate high levels of revenue, all else being equal. Units in the Territories generated more revenue on a per unit basis and housing in the Prairies considerably less than in the remainder of the country. While there are likely differences in the remainder of the country, the sample is not sufficiently large to

<sup>26</sup> With 95% confidence it can be inferred that low rise total net revenues are lower than either townhouse or elevated projects.

<sup>27</sup> With 95% confidence it can be inferred that social housing net revenues are lower than either private rental or condominium rental.

<sup>28</sup> Results here and below concerning the Territories are provided despite a sample size of only 2. High operating costs in these properties is, though, in line with a number of other sources (see Spector (1996) and CMHC (1992a)).

<sup>29</sup> Using these results, estimated net revenue for a unit in an low rise private rental building in the prairies with average size, (79 m<sup>2</sup>), turnover (32%), management fees (\$301), maintenance/repair expenditures (\$677) and contract service expenditures (\$307) would be \$6682 - \$1231 + \$716 - \$2490 + (\$6.95 x 79) + (\$3.28 x \$301) + (\$.76 x \$677) + (\$1.51 x \$307) + (\$.14 x 32) = \$6185 (or \$515/month).

distinguish these. Other characteristics that positively influence revenue are larger unit size, and higher expenditures for maintenance/repair contracted service and management fees. In addition, higher turnover building also tend to also be those which generate high per unit revenues.<sup>30</sup>

Inclusion of utilities or heating, utility expenditures, provision of a furnished unit, urban size, age of building and presence of rent control did not have distinguishable effects upon net rent revenue in this sample.<sup>31</sup>

## 2. Maintenance Expenditures

It was expected that maintenance costs would be significantly related to:

- type of heating system--with electric systems which tend to have simpler, easy to maintain apparatus generating lower maintenance expenditures;
- type of project--with lower costs in condominiums where unit maintenance is often the concern of residents;
- building type--with townhouse units tended to have higher levels of expenditures because of greater numbers of families with children, larger units, exterior surface and landscaped areas and elevatored buildings, with large numbers of units tending to deliver economies of scale;
- amount of unit floor area;
- average actual revenue, since as seen above, maintenance standards may be higher where higher paying clientele are attracted;
- average expenditures for recreation and amenities, which in turn require higher maintenance expenditures;
- the presence of high management fees and contracted services, again, reflecting high service levels;
- turnover, since maintenance expenditures are often tied to the need to paint and repair units at the point of turnover;
- age, with maintenance costs tending to increase with age; and
- geographic area, with extremes of weather and climate in the Territories expected to have a considerable impact upon the service life of various building components.

The following model characterized 36% of total variation in maintenance expenditures among the properties included in the sample:

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<sup>30</sup> This may also be an additional effect of social housing. Rent subsidies have the effect of "tying" tenants to units, since like alternatives in the private market will likely have higher rents, and residents, having limited income, have limited flexibility in their capacity to dedicate increasing amounts to housing. As a result, these buildings tend to have low vacancy rates and turnover costs.

<sup>31</sup> There are high levels of correlation between variables included in and excluded from the model. For example, size of unit and heating expenditure is highly correlated. Further, in this sample, elevatored buildings tended to have heat included in rent. Thus, variables included in this regression, because of "multicollinearity" may be at least partially surrogates for other, significant factors influencing revenue.

Maintenance/Repair expenditures = - \$168			
+	{Operation Type:	+ 72 if	Private Rental
		- 452	Condominium
		+ 380	Social Housing) <sup>32</sup>
+	{Type of Energy	+ 140 if	Gas/Oil
		- 140	Electric}
+		.10	Per Dollar Total Rental Revenue Generated
+		.93	Per Dollar of Management Fee Expenses

Condominiums as expected, tended to have much lower per unit expenditures levels, largely reflecting occupant/owner responsibilities for unit maintenance. Electric heating also has a significant, and predicted negative effect upon maintenance costs. As shown in the factor analysis, "luxury buildings" where rental revenues were high and there were higher management fee expenses tended to have much higher levels of maintenance expenditure.

No relationship was found between maintenance costs and unit floor area, building type, contracted fees, expenditures for recreation and amenities or region.<sup>33</sup>

### 3. Total Utilities (Heating, Electric and Water/Sewage Costs)

It was expected that utility costs per unit would be significantly higher in projects where:

- heating and utilities were included in rent
- when electric heating was in place
- in the Northwest Territories
- in buildings with high amounts of surface area (townhouses)
- where there was an enclosed garage
- where average unit sizes were large and
- in older buildings, where features incorporating energy efficiencies were less likely to be in place.

The following model characterized 56% of the total variation in utility/heating costs:

<sup>32</sup> A large difference in social housing and private rental maintenance costs seems to appear here, because of the small sample of social housing providers, a distinction between the two cannot be made with 95% confidence. Further this may be a result of an incapacity to isolate the offsetting effects of lower per dollar rental revenue and low management fee expenses in the social housing stock (formally referred to as a "multicollinearity effect").

<sup>33</sup> A weak positive relationship may exist in these data between maintenance costs and age. With 90% confidence, it could be said that age and maintenance costs were positively related and that maintenance costs increased by an estimated \$4 annually.

Total Utility Expenditures =	\$1094		
+ {Heat in Rent	+ 186 if Yes		
	- 186 if No}		
+ {Electric in Rent	+ 211 if Yes		
	- 211 if No}		
+ {Region	+ 807 Territories		
	- 807 Elsewhere in the country}		
+ Per Square Metre of Unit Size	96		

As would be expected, utility costs were highly related to whether or not heat and electricity were included in rent. Further, utility costs in the Territories, as expected, were significantly higher than in the rest of the country. Of particular significance, was a strong relationship between unit size and utility expenditures.

Type of building, presence of an enclosed garage, building age and surprisingly, type of heating system did not have a significant effect on total utility costs in this sample.<sup>34</sup>

#### 4. Administration and Advertising Costs

It was expected that administrative expenditures would be increase with:

- inclusion of electric and heating costs (and thus payment by landlord staff)
- a high proportion of parking units per residential unit (producing additional administrative activities)
- high turnover (and thus high advertising and rental staff activity)
- expenditures on recreational amenities (and associated administration)
- social housing (presence of rent subsidies requiring administrative action)
- location in the Territories (reflecting higher labour costs)
- expenditures on salaries and wages (and personnel administrative costs).

Administrative expenditures were also expected to be inversely relative to management fees, since, in many circumstances, management fees would be a substitute for administrative expenditures. In addition, it was expected that administrative expenditures would be lower in the Prairies and Atlantic regions, where labour costs were relatively low.

It was found that 27% of annual administration costs per unit could be characterized by the following model:

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<sup>34</sup> As noted above, because inclusion of heat is correlated with type of heating system in place, it is difficult to differentiate the two. In most cases, where there was electric heat, tenants were also responsible.

Administration/Advertising Expenditures = \$258			
+	{Property Type	- 90 if	Private Rental/Condominium
		+ 90	Social Housing]
+	{Region	+ 177 if	Territories
		- 104	the Prairies
		- 71	the Remainder of Country]
+		.11	Per Dollar Salaries/Wages Expend.

As expected, projects providing rent subsidy tended to have higher administrative costs than others. Further, as expected, administrative costs were significantly higher in the Territories than elsewhere, and lower in the Prairies. Also, as expected, where these were high, so too were expenditures on wage and salaries.

No relationship was found between administrative costs and the inclusion of utility or heating costs, turnover, location in the Maritimes (vis-a-vis location in the higher cost markets of Québec, Ontario or B.C.) or with high levels of expenditures on recreational amenities.

In summary, results indicate that there are clear and easily understandable relationships between total rental revenue, maintenance, utility and administrative costs and various other property characteristics and expenditure patterns. In each case, a significant proportion of differences in these expenditures are characterized by parts of the models hypothesized.<sup>35</sup>

#### IV. Maintenance Expenditures in the Private Rental and Social Housing

Are there significant differences in expenditure levels between social housing and private rental accommodations? One area where comparison is possible is maintenance expenditures, using this sample and work recently completed on maintenance and replacement expenditures in Canada's social housing stock (Spector (1996)). In 1992, maintenance expenditures in Canada's federally administered social housing stock were an estimated \$685 per unit<sup>36</sup>, in comparison to \$673 in the 72 private rental buildings included in this sample. At this very aggregate level, it is clear that levels of maintenance expenditure in private rent and social housing cannot be differentiated with any level of statistical confidence. Remarkably, these data seem to indicate a strong

<sup>35</sup> Note that there is a positive correlation between the proportion of variance explained and the magnitude and variability of the revenue/expenditure item. This likely indicates that there is consistent level of error among along revenue/cost items due to factors such factors as differences in accounting and interpretation of the survey (see Galtung (1967), pp. 47-50).

<sup>36</sup> Based upon a sample of 10,363 projects, approximately 54% of all social housing providers operating in 1992 (from (Spector (1996)).

similarity.

The validity of these comparisons is limited by the separation of expenditures for labour, contracted services and activities for the servicing of recreation and amenities from maintenance expenditures in this sample. Social housing data excluding these costs may produce a very different picture--for example the small sample (8) of social housing properties had average annual maintenance expenditures of \$610 per unit, well below that of the sample of private rental buildings.

Results reported here and in Spector (1996) may indicate that the closeness of these results may be the result of a number of other, off-setting differences significant to maintenance expenditures in the two portfolios, related to location, type of operation and age:

- there is a considerable difference in the average age of the private rental buildings sampled here and the stock of social housing. In 1994, social housing was an average of 14 years old, in contrast to 24 years for the stock in this sample. Using the larger sample in the social housing stock, it was found that maintenance costs clearly increased with age.<sup>37</sup>
- within the co-operative portion of the non-profit sector, maintenance activity is often undertaken by members as unpaid volunteer labour.
- a small, but significant portion (2%) of the non-profit stock is located in remote areas of the country where maintenance costs are extremely high.
- the results above indicate that there is strong relationship between maintenance expenditures and total per unit revenue, likely pointing to high maintenance and repair requirements in the significant number of private rental buildings which are amenity rich. In contrast, social housing has been built to provide minimum, adequate standards.

## V. Recommendations Regarding Future Work

In this section and in Appendix II discussion turns to recommendations for a sampling mechanism to provide for usable estimates of financial statistics at regional levels for differing building types and to refinements in the questionnaire instrument.

### a. Sampling Universe

An area requiring further study and outside the scope of this work is the development of full inventory of multi-unit residential operators in the industry. In the absence of such an inventory, there is always a danger of introducing major bias since it is impossible to characterize how representative any sample might be. Inventories are available for parts of this universe, for example, those providing federally assisted social housing, those belonging to voluntary and professional organizations and those who make up the universe of CMHC's annual survey of average rents. Still, a first step in undertaking additional work in the area is the development of

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<sup>37</sup> An estimate of the effect of age on maintenance and repair expenditures of \$4 per year was developed (see footnote 33).

this inventory.

### a. Adequate Sample Size

In total, 96 usable responses were provided by this survey. Statistics Canada provides a guideline for the testing of the reliability of the statistics that they produce, called the co-efficient of variation (V) (see for example, Arrowsmith et. al. (1994)). It is the ratio of the standard deviation of a statistic to its mean. If the mean or average is the statistic of interest, V is defined as shown in Equation 1. In this case, s is the sample standard deviation and  $s/\sqrt{n}$  is the estimated standard deviation of the mean.

A mean is said to be adequately reliable to be released by Statistics Canada, if it is less than a third of its estimated standard deviation (i.e.  $V < .333$ ). Advice is provided that a statistics should be used with caution though if  $.333 > V \geq .166$ .

$$V \leq \frac{\frac{s}{\sqrt{n}}}{\bar{x}} \quad [1]$$

Table 6 provides the results of applying the V statistic to the overall means of the various annual expenditure items obtained from the 96 completed surveys and an assessment of how adequate this sample size is. It indicates that for 17 of the 20 mean<sup>38</sup> expenditure statistics estimated, the sample size was adequate to assure that these statistics could be used without caution.<sup>39</sup> The three exceptions are: Recreational/Amenity Expenditures, Other Expenditures and Non-recurring Expenses. In two cases, relatively few respondents provided data, and where they did, expenditures varied considerably. The catch all "other" expenditures was used by the majority of the sample and varied quite considerably.

Table 6 also provides a more stringent and test of the adequacy of the survey statistics and also introduces some pragmatics. Adequate sample size is estimated where, V is set to .05--that is the standard error is 5% of the mean, or where it leads to a very small standard error (\$30 or less), whichever is greater.<sup>40</sup> This latter trip point is introduced to account for minor expenditure items where the mean is small. For example, for gross potential revenue (\$6,167 per unit), a

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<sup>38</sup> In a number of cases, as noted above, two annual expenditures are provided and the statistic given is a the mean of the two. It is thus likely that the case, that the statistics provided have a somewhat smaller level of error than indicated in Table 6.

<sup>39</sup> Results are not provided for expenditures for Other Gas/Oil since very few respondents provided this information.

<sup>40</sup> Statistics Canada suggests the introduction of a factor ( $\beta$ ) to account for the efficiency of the effect of the design varying from simple random sampling. For example, in Labour Force Survey (LFS) supplementary surveys, where known biases are introduced through the use of the LFS sampling method for alternative objectives, the estimated minimum sample size is doubled ( $\beta=2$ ) (Arrowsmith (1994)). It is not known to what degree the effects of the sampling methodology used here departed from random and given that very little is known about this population, it is difficult to estimate the relative efficiency of this sample design. The ad hoc methodology here, "very accurate" is roughly equivalent to defining  $\beta=3.32$ , indicating adequacy with quite major variations from simple, random sample.

sample mean standard deviation of less than \$2,056 is required to allow the release of that data, while for insurance expenditures (\$38 per unit), a sample mean standard deviation of \$13 is required. In Table 6, the five estimates satisfying this criteria are shown as "very accurate". In 4 of the five cases, the statistic provided is an aggregate--representing a group of revenue/ expenditures items (ie. actual revenue and operating costs).

The V statistic can also be used to determine a minimum adequate sample size. In estimating a minimum adequate sample size, it is assumed that the goal is to achieve, with a high level of confidence (in this case a result which will occur 19 out of 20 times (95%) a certain level of accuracy. Table 6 provides the minimum sample size using 3 criteria:

Variable	V Score	Assessment	For Population: Minimum Sample, with 95% Confidence to:			Minimum Sample: 5 Regions, 3 Building Types, 20% sample of Territories	
			1. Avoid Suppression	2. Avoid Caution	3. Attain "Accuracy"	Accuracy Level (1,2 or 3)	Size
Gross Potential Revenue	0.048	Very Accurate	6	25	281	1	4,281
Rental Revenue	0.048	Very Accurate	7	30	336	1	5,040
Vacancy/Other Losses	0.136	Accurate	61	247	1,290	2	3,708
Miscellaneous Revenue	0.137	Accurate	62	253	895	2	3,857
Total Operating Costs	0.037	Very Accurate	4	18	207	1	3,171
Salaries & Personnel	0.065	Accurate	13	55	280	1	4,267
Total Utilities	0.046	Very Accurate	6	28	306	1	4,649
Heating	0.058	Accurate	11	45	262	1	3,994
Electricity (non-htg)	0.091	Accurate	27	111	317	1	4,816
Water/Sewage	0.070	Accurate	16	65	152	1	2,349
Management Fees	0.038	Very Accurate	4	19	52	1	849
Administration and Advertising	0.103	Accurate	32	69	69	1	1,101
Repair & Maintenance	0.065	Accurate	13	56	605	2	900
Contracted Services	0.101	Accurate	33	135	392	2	2,090
Insurance	0.067	Accurate	2	2	2	1	102
Taxes	0.068	Accurate	14	61	682	2	975
Recreational/ Amenity	0.446	Suppressed	484	484	484	3	7,320
Other	0.191	Caution	121	490	986	3	2,475
Non-recurring Expenses	0.676	Suppressed	1,550	6,247	9,171	3	120,191

- Statistics Canada's suppression level (where  $V < .33$ ) or a standard error of \$30 per year (whichever was greater), 95% of the time;
- Statistics Canada's caution level (where  $.33 < V < .16$ ) or a standard error of \$30 per year (whichever was greater), 95% of the time; and
- A standard error of 5% or less of the mean ( $V \leq .05$ ) or a standard error of \$30 per year (whichever is more restrictive), 95% of the time.<sup>41</sup>

In addition, these figures take into account that in some cases, complete information was not provided. For example in 2 of 96 surveys (2%) there was no response to any utility expenditure items. In this case, to obtain an adequate sample size, it is assumed that 2% over-sampling is required to gain an adequacy sample size for this expenditures item.<sup>42</sup>

If analysis is required at a more detailed level, then this sample size very quickly becomes inadequate, irrespective of the level of variation in the data. To develop adequate estimates by region and by building type, for example, requires a much larger sample. In Table 6 these estimates are provided, assuming a very large population in each of the regions and an estimate of 350 projects in the territories.<sup>43</sup>

It shows that with a random sample of just over 5,000 completed, usable surveys:

- for 11 of the 19 revenue and expenditure categories specified, "highly accurate" estimates of mean values with a high level of confidence for regional estimates by building type, at least 95% of the time would be provided. In these cases, it is highly unlikely that estimated mean values would be suppressed or that caution would be advised;
- Estimates for an additional 5 cost categories would be likely to be sufficient to avoid Statistic Canada's "caution" warnings at least 19 times out of 20. In these cases, it is highly unlikely that estimated mean values would be suppressed.
- Estimates of 1 cost category, contracted services, would be provided without suppression at least 95% of the time. In this case, expenditures were generally small but varied considerably across projects (see Table 3).
- Estimates for 2 cost category would very likely be suppressed more than 1 time out of

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<sup>41</sup> These statistics are provided based upon an assumption of truly random sampling. When this is the not the case (as is usual), a factor is introduced to allow for additional sampling. Statistics Canada usually over-samples to compensate for the many factors which can lead to a sample not being truly random. For example, in the labour force survey (LFS), the sample is at least double that would be required to produced adequate V statistic 95 times out of 100 (Arrowsmith (1994), pp.64) (i.e. a  $p(V < .166) < .05$ ).

<sup>42</sup> Taking the conservative path, it is assumed that where null expenditures are provided, these data are missing. It is likely though, that in many circumstances, these expenditures are actually null.

<sup>43</sup> Estimation procedures for minimum adequate sample size with a finite population are found in Dsu and Raghavarao (1990)). For the Territories, the total number of rental projects was estimated as follows: There were 14,900 renter households in the Territories in 1991 (Statistics Canada (1993a)). The average size of co-operative projects (CMHC (1992b) and buildings surveyed here was 43 units. It is thus estimated that there were approximately 350 buildings in the Territories.

twenty. Low reporting levels and high variability in the levels of non-recurring and recreational/amenity expenses would likely lead to poor estimates of mean expenses for these categories with this sample size.

### c. Survey Questionnaire Revisions

Appendix I provides a copy of survey used in the pilot study. Appendix II is a revised draft survey questionnaire that is designed to improve upon a number of deficiencies that came to light as a result in analyzing the results of the pilot survey, in reviewing the literature and in discussions with experts in the field. Briefly, contrasting the two survey indicates that the following have been:

#### Added:

- Type of management operating building;
- Presence of an ongoing government operating subsidy;
- Site Size and uses of land at the site;
- Characteristics of non-residential tenants;
- Type of heating system; and
- Broad demographic characteristics of tenants.

#### Modified:

- References are made to "properties" as well as "buildings", depending on which concept is more relevant to the respondent;
- Types of parking available is expanded;
- A count is requested of various types of buildings;
- The range of services and amenities available and included in rent has been expanded;
- Building type categories have been modified to reflect a dichotomy between those with common space and those without common areas;
- Reference is made to the point of time at which the last major rehabilitation of the property was undertaken as well as the age of the building;
- Type of property is now "Type of Operation" to use vocabulary more common in the industry;
- Revenue Categories have been changed to identify commercial and other revenue;
- All Administrative and rental costs fall into a single category;
- All maintenance, repair and upkeep costs fall into a single category;
- Administrative and Maintenance, repair and upkeep costs are both categorized into labour costs, materials and equipment, contract services and management fees;
- "other costs" include amenity related services; and
- the "non-recurring costs" category has been changed to include major capital expenditures.

#### Removed:

- Separate cost categories for heating and non-heating uses of fuels and recreational services

Question pertaining to rent control.

## VI. Conclusions

This report provides an overview of the results of a pilot survey designed to gather data on operating revenues and expenditures in Canadian residential rental operations. It demonstrates that, even with this relatively small sample, there are a number of strong relationships that likely exist between operating/building characteristics and expenditure patterns. For example

- ◆ There are likely distinct large, but distinctly different groups of operations in the industry. Among respondents, significant numbers could be characterised as:
  - "Family townhouse operations" which provide larger units, large amounts of exterior parking and which have higher than average water/sewage and property tax expenditures.
  - "Amenity rich operations": which tend to generate high rent revenue but also generate high expenditures for insurance, repairs and maintenance. These operations also tend to have enclosed parking.
  - "High rise" buildings, which tend to have higher personnel costs and utility costs. These buildings also tend to provide a number of ancillary services and generate a relatively high level of miscellaneous, non-rent revenue.
  - "Condominiums Operations", which have high per unit expenditures for recreational and amenity related facilities but, reflecting the extended responsibilities of residents, low heating and insurance costs.
- ◆ There also seem to be a limited number of factors which account for a considerable amount of the differences in revenues and certain expenditure items in multi-unit residential buildings:
  - Just under 70% of differences in respondents' revenues per unit could be attributed to factors such as building type, region, type of operation, average unit size and level of service provided and
  - Over a third of differences in maintenance costs per unit could be attributed to type of operation, the type of heating system in place, and the level of amenities provided.
- ◆ Results such as these can be used to assess the efficiency of scarce government

expenditures in this area. For example, using maintenance expenditures for private rental buildings as a benchmark and corresponding data gathered by CMHC regarding social housing indicates that average maintenance expenditures in Canada's federally administered social housing are extremely similar to those in Canada's private rental stock.

Further analysis in this area could go a long way towards developing a useful understanding of the Canadian residential real estate management industry. Experiences in gathering these data in the United States, Great Britain, the Netherlands and Denmark have all been seen by the industry as positive contributions (IREM (1995), NAA (1992) and Legg (1989)).

Extending this analysis, refining the survey instrument and the sampling mechanism would very likely lead to the uncovering of a number of regularities that would be significant in providing broad insights about the operations of the residential rental sector in Canada which would be useful to participants in this sector and the housing industry, in general. First and foremost, a larger sample is required for the development estimates good enough to be used for analysis at a regional level and for differing types of operations. Estimates of a minimum adequate sample size of approximately 5,000 projects would safely meet many of these requirements. Secondly, concern should be provided to developing a sampling methodology which assumes that the data collected characterizes the industry. This is particularly major difficulty since there is presently no means for identifying the full universe of operators in the rental sector. Inventories are available for parts of this universe, for example, those providing social housing and those belonging to voluntary and professional organizations. Without such an inventory, it is difficult to characterize how representative any sampling mechanism might be. Thirdly, the survey instrument requires refinement in order to ease respondent burden and capture a more complete inventory of factors influencing operating expenditures. Suggestions which could meet this latter end are provided in the form of a revised survey instrument included as Appendix II.