THE MUNICIPAL HOUSE CONDITION SURVEY PACKAGE:
SUMMARY

by

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INTRODUCTION

Canada Mortgage and Housing Corporation (CMHC) has been developing techniques to evaluate the physical condition of the housing stock since the mid-1970s. In 1979-81, CMHC and the U.S. Department of Housing and Urban Development undertook a major study of housing conditions, and Ekos Research Associates conducted a pilot study in Ottawa as part of this effort.[1] The Ekos study produced the first generation of surveys of the physical condition of houses in Canada.

These first-generation surveys were a breakthrough in the efforts to evaluate the physical condition of housing. One of the most important developments was the demonstration that interviewers who had no previous experience in housing but were trained to use the survey instrument could produce consistent, reliable results. Because it is far less expensive to hire trained interviewers than it is to hire building experts, the potential for applying such surveys was greatly expanded with this development.

A number of other important advances were also made in the first-generation surveys. Advances include
- the development of continuous rating systems
- the identification of the basement and dwelling exterior as the key areas for inspection
- the development of summary measures
- the development of training techniques and manuals.

The Municipal House Condition Survey Package (MHCSP) represents the second generation of surveys of the physical condition of houses. MHCSP incorporates modifications of the first-generation surveys based on their successes and limitations and produces a fundamentally new survey instrument. MHCSP is an interviewer-delivered inspection of the dwelling that concentrates on the basement and exterior and uses continuous rating scales where possible. The gains realized by MHCSP will further the development of the third generation of instruments — accurate, standardized, occupant-delivered instruments.

MHCSP consists of the survey instrument, training packages, and the designs of the sample, data processing, and analysis. It is intended that the package will help municipal, provincial, and federal agencies establish and monitor the physical condition of the housing stock and the changes in this stock.

Although some design work on the sample frames is still necessary, most design work on MHCSP is complete. The tasks remaining before pilot testing comprise the development of the training package, the refinement and production of the survey instrument, and translation.

ADVANCES MADE IN MHCSP

With the advantage of hindsight and the experience of several applications of earlier approaches,[2] it is possible to resolve some of the outstanding issues in surveys of the physical condition of houses. The major issues addressed in MHCSP are

- o   the standardization of results
- o   the development of summary measures
- o   the evaluation of items covered in the instrument.

Each of these issues is discussed in this report.

The Standardization of Results

If agencies, including CMHC, municipalities, and provincial housing corporations, are to use the physical condition of dwellings to establish priorities for expenditure, evaluations of physical condition must produce reliable, standardized results.

The first-generation instrument has been applied only to fairly homogeneous dwellings, such as those in central Ottawa, Department of National Defence (DND) base housing, and on-reserve housing. Consequently, the instrument's effectiveness in comparing the condition of a wide range of dwellings has yet to

be tested. For example, can we feel confident that a rating in Ottawa, such as a 4 on a 7-point scale, would also be a 4 in St. John's? In fact, comparability was the first concern of building experts who, having completed the DND survey, asked what a 4 really was. They commented that an average base dwelling (rated a 4) would probably have been rated a 1 (top condition) on a number of reserves.

MHCSP's first step in standardization has been to approach the evaluation of the condition of the dwelling from the point of view of the ability of the dwelling systems to perform their function.[3] The first-generation work established inspections of the basement and exterior as sufficient to predict the condition of the dwelling.[4] In MHCSP, two functions are identified for building systems: structure and envelope. For example, two functions of the perimeter walls of the basement must be evaluated separately, namely, their ability to hold the building up (structure) and their ability to keep water and soil out (envelope). By contrast, interior basement supports have only a structural function.
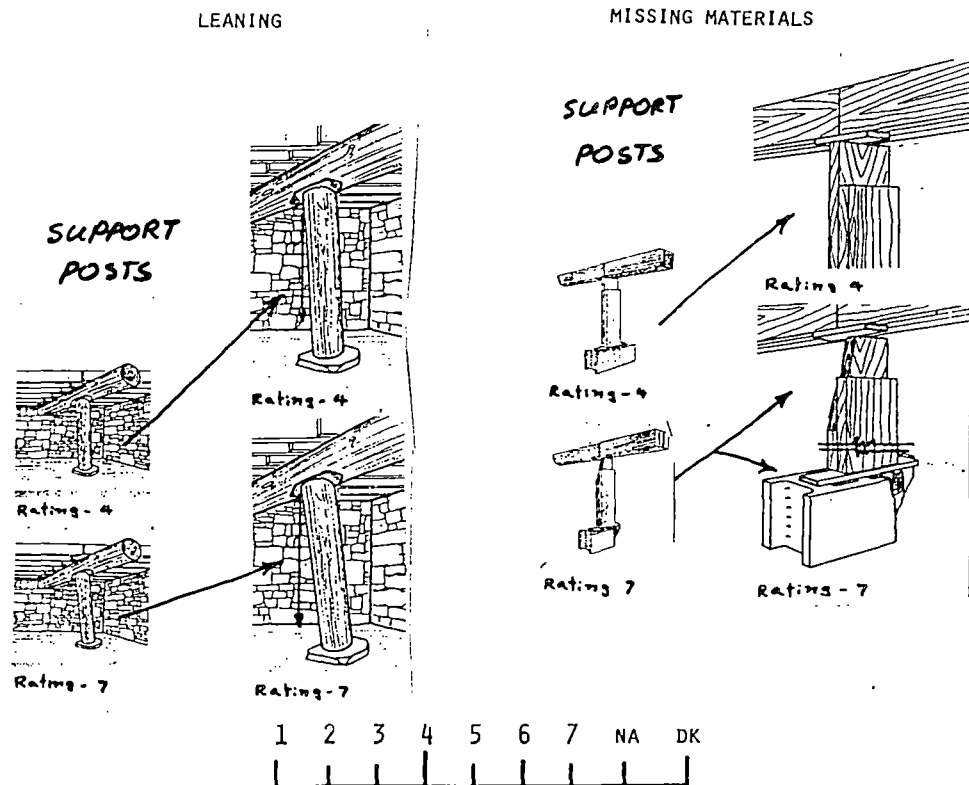
The use of the building system's function permits specific descriptions of positions on a scale. Performance is evaluated by the presence and degree of severity of indicators of faults, such as cracks and crumbling (structure) and water stains and mildew (envelope). In the MHCSP, only indicators that provide essential information on the ability of a system to perform its function are listed.

The second step in standardization is the use of drawings of indicators of faults to standardize evaluations. Drawings are produced for three of the seven points on the rating scales (1 - functioning perfectly; 4 - minor function failure, maintenance overdue; 7 - total loss of function). Drawings are to be used in training and in the field. The objective in training is to establish a Canadian standard. In the field, drawings are to be used to check the tendency to drift from the standardized values towards the averages for the dwellings being inspected.

Thus in the case of the evaluation of the walls of the basement perimeter, the ability to hold the building up is based on a standardized, controlled evaluation of

essential indicators of faults. The evaluation of performance is standardized, as are the ratings for the Canadian housing stock.

RATE THE STRUCTURE OF SUPPORT POSTS OR CENTRE COLUMNS IN TERMS OF

LEANING   MISSING MATERIALS

SUPPORT POSTS

SUPPORT POSTS

Rating - 4

Rating - 4

Rating - 4

Rating - 4

Rating - 7

Rating - 7

Rating - 7

Rating - 7

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1  2  3  4  5  6  7  NA  DK
L__|__|__|__|__|__|__|___J
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The middle position on the scale is intended to represent the average of the entire stock. The description of all the positions must be assessed after the results of the pilot are available.

The Development of Summary Measures

A summary measure rating the overall condition of the dwelling is a desirable and necessary objective: the measure is essential for relative rankings both within and between geographic areas. In the first-generation surveys, an overall summary index was produced by averaging the evaluations of all components.

The argument for such averaging is that an equal weighting minimizes bias where there are no clear arguments for using different weights. This argument is

standard and valid in social science research, but caution must be exercised in the application of the argument. It is important that all inputs to the summary measure be essential and as homogeneous as possible.

In MHCSP, five summary measures are generated and weighted equally to produce an overall summary measure of the physical safety and adequacy of the structure. The five summary measures are for the following system functions: basement perimeter structure, basement envelope, basement interior structure, exterior wall envelope, and roof envelope. These system functions are homogeneous and essential to the physical functioning of the structure. Furthermore, failure in any one will affect all others.

Functions such as mechanical systems are also evaluated in MHCSP. Other items, for example, missing railings, affect the safety of the dwelling. However, there are compelling reasons for using a weighting different from that for the system functions in the overall summary measure.[5] Consequently, only the five system functions are included in the overall summary measure.

All of the summary measures, including the overall measure, are continuous rankings produced from standardized inputs. Measures can therefore be expected to be very reliable for the entire housing stock. They evaluate and rank the ability of the physical structure to perform its functions of structure and envelope, but they do not identify whether the most suitable response to impaired functions is, repair or replacement. Determining the appropriate response requires inspection by qualified personnel — and even then is as much a social and economic decision as a physical one. In other, words, MHCSP identifies what structures should be inspected and directs the building expert to the area of the structure where problems have been identified.

The Evaluation of Items Covered in the Instrument

A number of shortcomings of first-generation instruments have been addressed in MHCSP. For example, some concerns, such as moisture and special needs of the occupants, were not as well documented when first-generation instruments were

developed as they now are. In addition, the coverage of the instrument has been expanded so that rural and urban dwellings of up to six storeys can be inspected with one instrument.[6] In most cases, such modification is limited to the addition of items designed to capture information.

In some areas, such as the evaluation of mechanical items, new approaches are used in MHCSP. The first-generation surveys demonstrated the usefulness of continuous rankings of components and dwellings. It was argued convincingly that the continuous rankings are more reliable and useful than the more common pass/fail evaluations, such as those used in the United States. However, in some situations, such as the evaluation of mechanical systems, it is difficult to provide a continuous ranking without a destructive examination.[7] In MHCSP, the household evaluates mechanical systems on a pass/fail basis. It is felt that this approach is a realistic acknowledgement of the limitations of possibilities for inspection and an appropriate use of those who have the most information about how such systems function. Similarly, evaluations of roofs are limited to the envelope function, and even this function is included only if the interviewer has a clear view of the roof.

Moisture and fire and safety items have been developed for MHCSP. The pilot results can be used to investigate the possibility of producing a summary moisture measure from the 11 items on moisture. The 12 fire and safety items are directed primarily towards multiple-unit buildings and are evaluated on a pass/fail basis. The items are coded so that local fire officers can identify buildings that fail any of the fire and safety items.

SUMMARY

MHCSP has greatly improved standardization by using drawings of indicators of faults in two functions, structure and envelope. Standardization has greatly assisted the development of an improved summary measure of the dwelling structure. A number of different approaches have been used to evaluate items covered in the instrument, such as mechanical systems. These approaches have been based upon a careful examination of previous surveys and a realistic appraisal of the possibilities for results of high quality.

Footnotes

1 Ekos Research Associates Ltd., Pilot Study of Physical House Condition and Rehabilitation Need (Ottawa: CMHC, 1981).

2 DND evaluated approximately 2,500 units for married personnel in 1984. Ekos evaluated 1,500 on-reserve dwellings for DIAND and CMHC in 1984.

3 A 7-point scale is used, as it was in the first-generation surveys. However, the description of the points on the scales is quite different. A comparison of the DIAND and MHCSP namings is presented below. The DIAND application is one of the most recent of the first-generation instruments (1984). MHCSP descriptions in brackets are for training only. Only the 1, 4, and 7 verbal and pictorial descriptions appear on the MHCSP instrument.

Scale Rating	DIAND	MHCSP
1	top condition	perfect functioning
2	+ +	(begining to show wear)
3	+	(minor function impairment, maintenance due)
4	average condition	minor function impairment, maintenance overdue
5	-	(serious function impairment)
6	- -	(serious function impairment/health or safety hazard)
7	totally replace	total loss of function

4 Structural evaluations by interviewers in the Ottawa pilot were not very successful. Apparently subsequent applications have had better results because of improved attention to these evaluations in training. Because training for MHCSP will be in a less controlled environment than the first-generation instrument's training was, it has been necessary to improve the performance of the instrument itself.

5 Mechanical items are extremely difficult to evaluate, and costs of repair are variable. Only in rare cases do failures in mechanical items have structural implications. Thus, mechanical items are fundamentally different from structure and envelope items.

6 A survey instrument for higher density multiple buildings is being developed in the National Office Support Centre by Frank Pelley, who also provided essential support for the MHCSP.

7 In the Ottawa pilot, there was a startling lack of correspondence between expert inspectors' evaluation of mechanical systems and the evaluation provided by the household. Reliable evaluation of mechanical systems is often beyond the expertise of building experts.