
Planning and executing a major bookshift/move using an electronic spreadsheet

By Judith Compton Ellis

*Assistant to the Director of Library Services
Bucknell University*

Some calculations to aid in your book move.

The Ellen Clarke Bertrand Library recently completed a major building addition and renovation. This project involved moving the entire collection of over half a million volumes twice: first into the new addition while renovation of the existing structure took place, and second when the full building project was completed and the collection could be housed in the unified structure. The two moves occurred within nine months of each other, and in the process much was learned about the intricacies of book moves, a project that involves much detailed and methodical planning. Limited information is available on planning and implementing a book move.¹ Ours was unique in that an electronic worksheet was a major planning tool that allowed rapid calculations (and recalculations) and offered a format for using data in “what if” planning situations.

When building projects are in the planning stages, much thought has to be given to the timetable (or “phasing,” as the architects term it) for mov-

ing the collection. Book moves disrupt patron library use. There is much noise from booktrucks and bookmoving crews, and material may be inaccessible at certain times. If at all possible the move should be targeted for when classes are not in session.

Further considerations are the flow of the total collection, traffic patterns in the building, how major subdivisions within the collection can be housed together, and the ease with which a user can browse through a section of call numbers without wondering where the next one can be found.

Overview of the process

Planning a book move involves six steps:

1. measuring the collection;
2. assessing equipment and staff needs;
3. determining the amount of shelf space needed;
4. planning the collection layout, given the amount of material to be moved and the available shelf space;
5. assessing the logistics of the move; and
6. preparing the shelf space for the move.

The order of the process is important. Not until you measure the collection can you determine the scope of the move and the costs of equipment and

¹See D.L. Kurkul, “The Planning, Implementation, and Movement of an Academic Library Collection,” *College & Research Libraries* 44 (July 1983): 220–34, for brief reviews of significant contributions and for her methodology in planning and implementing book moves.

FIGURE 1

Spreadsheet for Bookshift/Move

Class Letter	No. Shelves	Empty Space (inches)	Lin. Ft. 8/86	Projected Lin. Ft. 8/87	Moving Time (days)	Books + Space (Ft.)	No. Sections per Class
A	28	32	80.17	81.77	0.08	146.19	8.24
B	870	102	2565.25	2616.56	2.62	4677.81	263.54
C	39	66	109.88	112.07	0.11	200.36	11.29
D	902	237	2648.67	2701.64	2.70	4829.93	272.11
E	356	100	1044.83	1065.73	1.07	1905.29	107.34
F	221	71	647.88	660.83	0.66	1181.42	66.56
G	159	46	466.54	475.87	0.48	850.75	47.93
TOTAL	2575	654	7563.21	7714.47	7.71	13791.75	777.00

Total Lin. Ft. Shelving, 8/87 = 13791.75
 Space for Growth = 6077.28
 Fraction of Shelving Available = 0.44 15.64 = In./Shelf
 Fraction Space/Lin. Ft. Books = 0.79

staff. Once budget provisions are made, steps three through six follow a natural sequence.

Gathering necessary data

Measuring the collection to be shifted.

Book moves are almost always necessitated by overcrowded shelves, so it is easier to measure the empty shelf space in each subunit and subtract that from the total space to obtain the linear footage of materials to be moved. Measuring the collection

accurately is crucial to the move's ultimate success. Spot-checking for accuracy is recommended as the measuring takes place. Large units should be broken down into many smaller subunits that will serve as valuable guideposts when the move takes place. It is more advantageous to divide the Q class into Q, QA, QB, QC, and so on, than to have only one measurement for the entire science collection.

Calculating linear feet per classification.

The measurement data should be used to de-

FORMULAS

Formula 1:

$$\text{Lin. Ft.} = [(\text{No. of shelves} \times 35.5") - \text{space on shelves}] / 12$$

Formula 2:

$$\text{Lin. Ft.} \times 1.02 = \text{Projected Lin. Ft.}$$

Formula 3:

$$\frac{12" \times 1 \text{ shelf} \times 1 \text{ section} \times \text{crew day}}{\text{ft.} \times \text{shelf width (in.)} \times \text{no. full shelves/section} \times 46 \text{ sections}}$$

Formula 4:

$$\text{Total Lin. Ft. shelving} = \text{no. sections} \times \text{no. shelves/section} \times \text{length of shelf (in.)} \times 1 \text{ ft./12 in.}$$

Formula 5:

$$\text{Total Lin. Ft. Shelving (8/87)} - \text{Total Projected Lin. Ft. (8/87)} = \text{Space for Growth}$$

[The Fraction of Shelving Available for Growth = Space for Growth / Total Lin. Ft. Shelving (8/87)]

Formula 6:

$$\text{Books Plus Growth Space} = \text{Projected Lin. Ft.} + (\text{Projected Lin. Ft.} \times \text{Fraction Space/Lin. Ft. Books})$$

FIGURE 2

	A	B	C	D	E	F	G	H
1	SPREADSHEET FOR BOOKSHIFT/MOVE							
2								
3			EMPTY		PROJECT.	MOVING	BOOKS	NO.
4	CLASS	NO.	SPACE	LIN. FT.	LIN. FT.	TIME	+SPACE	SECTIONS
5	LETTER	SHELVES	(INCHES)	B/86	B/87	(DAYS)	(FT)	PER CLASS
6								
7	A	28	32	$(B7*35.5-C7)/12$	$(D7*1.02)$	$(E7*0.001)$	$+E7+E7*E*22$	$(G7*12)/(35.5*6)$
8	B	870	102	$(B8*35.5-C8)/12$	$(D8*1.02)$	$(E8*0.001)$	$+E8+E8*E*22$	$(G8*12)/(35.5*6)$
9	C	39	66	$(B9*35.5-C9)/12$	$(D9*1.02)$	$(E9*0.001)$	$+E9+E9*E*22$	$(G9*12)/(35.5*6)$
10	D	902	237	$(B10*35.5-C10)/12$	$(D10*1.02)$	$(E10*0.001)$	$+E10+E10*E*22$	$(G10*12)/(35.5*6)$
11	E	356	100	$(B11*35.5-C11)/12$	$(D11*1.02)$	$(E11*0.001)$	$+E11+E11*E*22$	$(G11*12)/(35.5*6)$
12	F	221	71	$(B12*35.5-C12)/12$	$(D12*1.02)$	$(E12*0.001)$	$+E12+E12*E*22$	$(G12*12)/(35.5*6)$
13	G	159	46	$(B13*35.5-C13)/12$	$(D13*1.02)$	$(E13*0.001)$	$+E13+E13*E*22$	$(G13*12)/(35.5*6)$
14								
15	TOTAL	$BSUM(B7..B13)$	$BSUM(C7..C13)$	$BSUM(D7..D13)$	$BSUM(E7..E13)$	$BSUM(F7..F13)$	$BSUM(G7..G13)$	$BSUM(H7..H13)$
16								
17	TOTAL LIN.FT. SHELVING, B/87 =				$(# SECTIONS)*(# SHELVES PER SECTION)*35.5/12$			
18	SPACE FOR GROWTH =				$+E17-E15$			
19								
20	FRACTION OF SHELVING AVAILABLE =				$(E18/E17)$		$+E20*35.5$	$=IN/SHELF$
21								
22	FRACTION SPACE/LIN FT BOOKS =				$+E18/E15$			

velop a spreadsheet, such as that shown in Figure 1, for planning your move. Figure 2 shows the cell formulas for the sample spreadsheet. The data from the measurement project is entered into columns labeled Number of Shelves and Empty Space (Inches). Linear Ft. [Date] is calculated by Formula 1.² In most cases the measuring is done much earlier than the move; if so, *projected* linear feet must be calculated. This can be done by dividing the cataloging department's estimate on volumes added between measuring and moving by the total number of volumes measured. This will yield an average percentage growth for the entire collection; subunits can also be calculated individually for additional accuracy. The growth factor used in this example gives an average collection growth of 2%. See Formula 2.

Planning for staff and equipment

Staff

The staff time required for a move depends on many factors: the distance, special equipment available, the number of moving crews, etc. In the Bertrand Library move, the formula used was for a moving crew of five persons (two loading, one traveling, two unloading) shifting 46 full sections of books in one 8-hour work day. Since the collection is measured in linear feet, the sections need to be converted to linear feet to obtain a value of linear feet per day.

The conversion factor is given in Formula 3. If the shelf width is 35.5" and seven shelves per section are filled, the conversion factor becomes .001 crew day/linear foot of books. This factor is used in calculating Moving Time (Days). Multiplying the Projected Lin.Ft. of books times the conversion factor of .001 crew days/linear feet will yield the

²35.5 inches is a standard shelf length. Adjustments for other shelf lengths may be necessary.

time it will take for a five-person crew to move that particular section of books, i.e. Moving Time (Days).

By using the information in the Moving Time (Days) column, the following can be predicted:

a) *Total moving time.* Moving the entire sample collection will take almost eight working days for a crew of five.

b) *Guideposts.* You can tell whether the move is on schedule by looking at the moving time necessary for each subsection. Well before the end of the first day the moving crew should be starting the B classification.

c) *Planning the order of the move.* If in the new arrangement the F classification is to be housed where the C's used to sit, it is clear from the spreadsheet that the F's cannot be moved until nearly three ($0.08 + 2.62 + 0.11 = 2.81$) crew days of moving A-C have passed.

d) *Estimating wages.* Staff costs may be estimated by multiplying the total moving time \times 5 crew members \times 8 hours per day \times the wage rate. Additional payroll costs for the crew supervisor and professional staff time should be added to this.

Shelf space

Calculating available shelf space

To plan the collection housing effectively a detailed floor plan of the new space is necessary. The floor plan should include the position of each section of shelving in the new space.³ For the Bertrand Library, architectural shelving blueprints were provided. If blueprints are not available, carefully hand-drawn floor plans should be drawn up. To calculate the total linear feet of shelving available,

³In the Bertrand Library situation, the extra growth space allowed us only to consider using six of the seven shelves per section. The seventh would be left empty for future growth and was thus not considered for the move.

use Formula 4. In the sample, the figure for Total Lin.Ft. Shelving equals 777 sections \times 6 shelves/section \times 35.5"/shelf \times 1/12, or 13,791.75 feet.

Now you may calculate how much room each part of the collection will occupy in the new shelving arrangement by using Formula 5. In the sample this number is 0.44. This means that for every inch of shelving, 0.44 inches of it will be available for growth. This is converted into In./Shelf by multiplying Fraction of Shelving Available by the length of the shelf in inches.

Calculating new shelving sections needed per classification

The relationship between Space for Growth and Total Projected Lin.Ft. will be needed to calculate the shelving needed, Books Plus Growth Space (Ft.), for each section of books. This ratio is 0.79 in the sample spreadsheet.

Books Plus Growth Space (Ft.) is calculated by taking the linear footage of books in a class and adding the amount of empty space available (see Formula 6). Number of Sections Per Class is the simple conversion of the linear feet in Books Plus Growth Space to bookshelf sections. Linear feet are changed to inches (\times 12) and divided by inches per shelf (35.5") and shelves per section (6). All this preparation will allow you to visualize the new arrangement.

Planning the collection layout

Gross arrangement

Using the Number of Sections Per Class and the floor plan that shows the bookstack sections in the

new shelving space, you can now begin to plan your arrangement. Before you start, you should consider the following:

a) Where is the best starting point for the new arrangement?

b) Will the flow be a natural one so that users can easily move from one stack area to another as they browse, or will they run into dead ends with no logical continuation?

c) If the ends of some stack areas are flush with walls, will the direction of the arrangement allow users to turn around and continue browsing, or will they need to move to the opposite end of the stack aisle (see Figure 3)?

After you determine the starting point and the general flow, then count out section by section the number of sections for each call letter. By doing this you can mark exactly where each new call number should begin (Figure 4). For this first arrangement, do not be concerned that a call letter spills over from one major stack area to another. This can be fixed later. The first attempt will give you a sense of where call numbers will generally be located and where adjustments need to be made.

Fine tuning

When you find that certain call number sections need to be divided into subsections to avoid spill-over, copy sections of the spreadsheet to new areas of the worksheet and make adjustments to correct for the new shelf space available in the new subsections. It is useful to compare the In./Shelf (empty space per shelf) of a newly calculated subsection to the In./Shelf of the overall collection to see if one

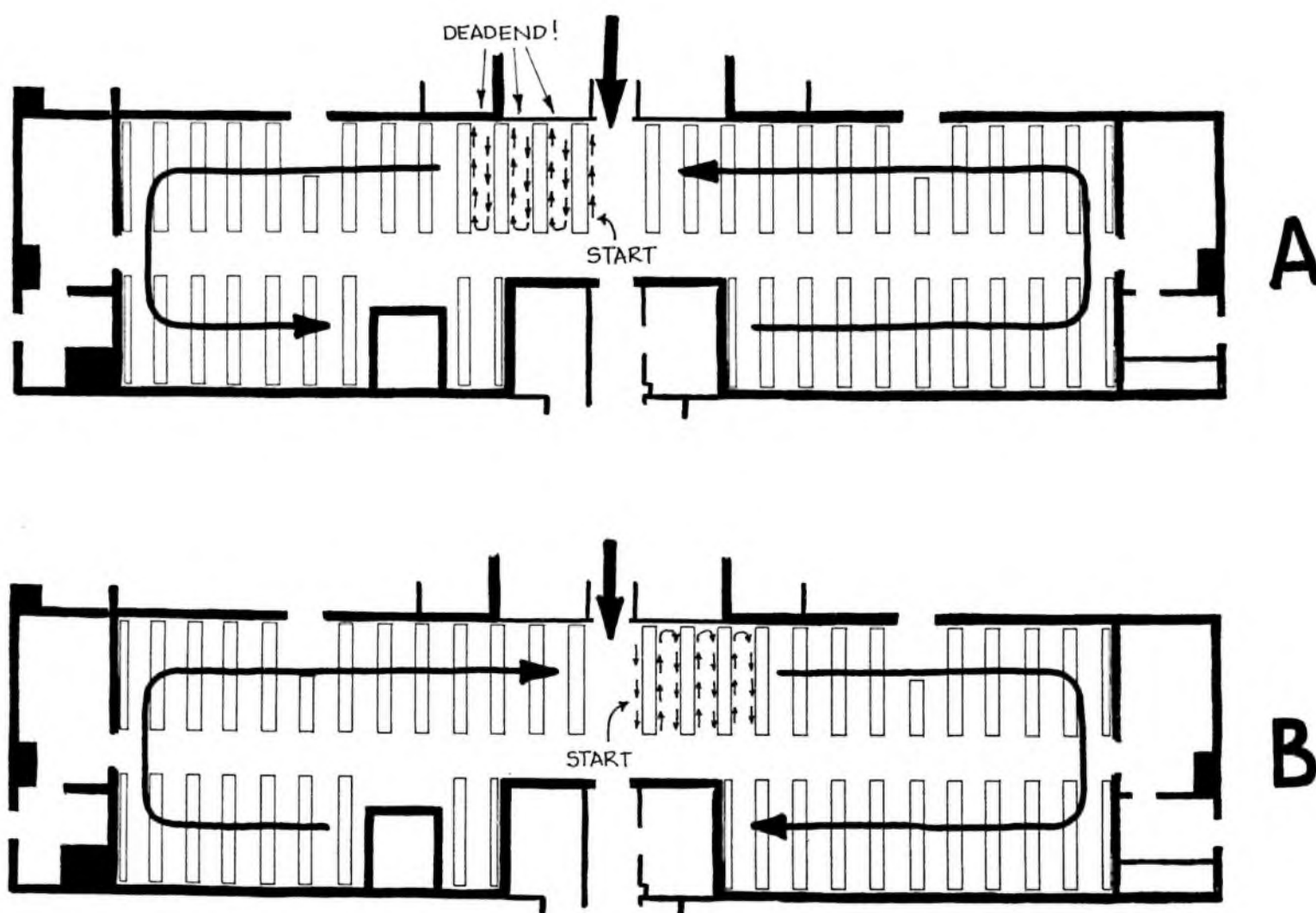


FIGURE 3

The flow of books is always left to right along a single-faced range. In Diagram A the patron is time and time again led into a wall, but in Diagram B the flow is serpentine and convenient.

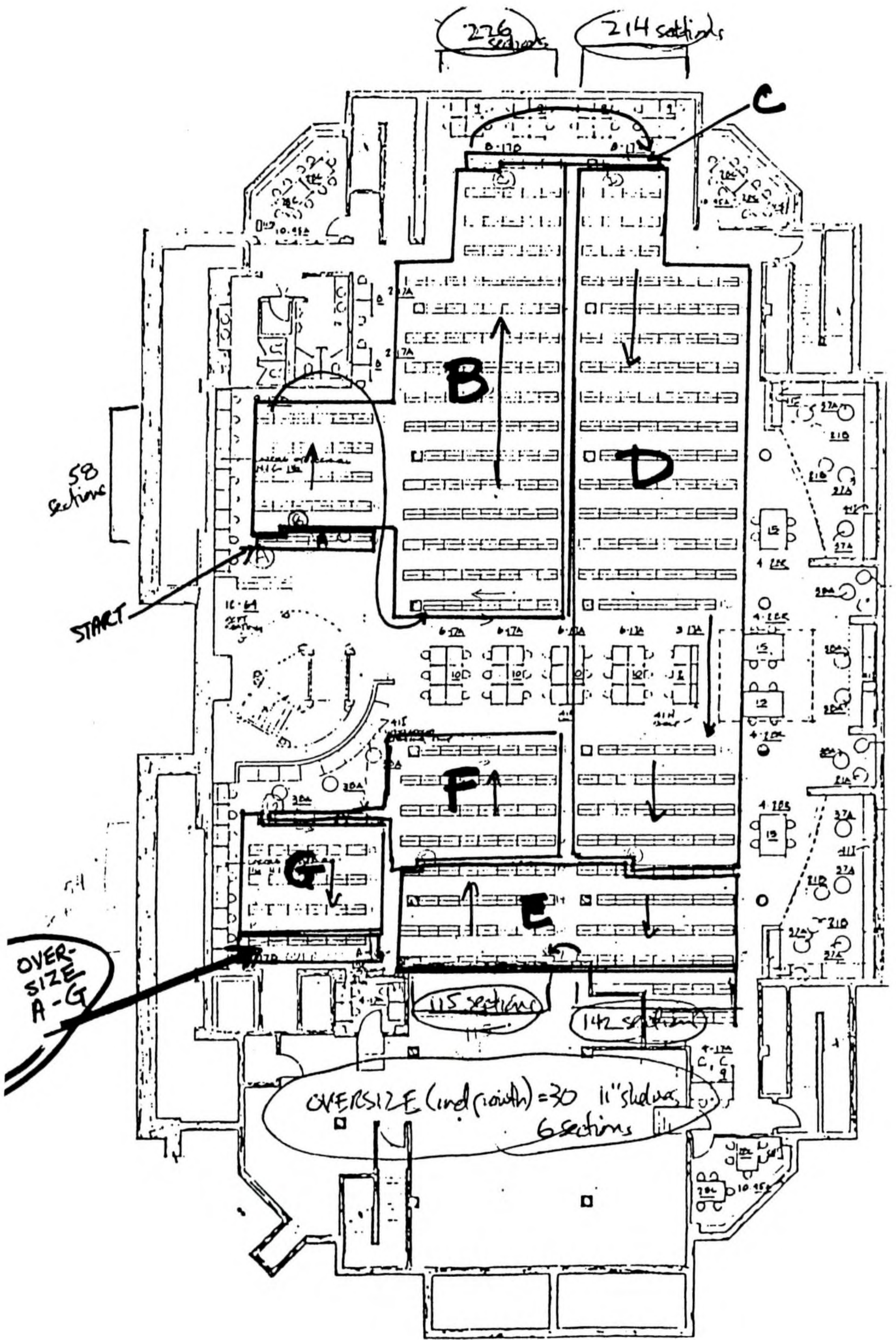


FIGURE 4

subsection is becoming too crowded. The power of the spreadsheet is that these numbers can be moved around much more easily on paper than in a physical move.

Preparing for the move

Marking major guideposts

Mark with call number designations the bookshelf sections where each new call number begins. You will then easily tell whether the books are actually fitting into the space planned for them. Also, if the logistics of the move require moving a section of books before the preceding section has been placed, the markings will indicate where to begin. However, you should try to avoid this situation, since it eliminates room for convenient adjustment if the preceding section overflows.

Marking fill direction

Although librarians know that the flow of books within a range is from left to right, bookmovers might not know this. To avoid confusion, place arrows indicating left-to-right flow in obvious spots on ranges of shelving. This is particularly important at the beginning of each moving day.

Marking amount of space to fill per shelf

The spreadsheet has determined the anticipated empty space for each shelf. Before the actual move, each section of shelving should be marked with a dot at the top to indicate exactly how far over to fill each shelf. This will save time during the actual move. In the Bertrand Library move the shelves were marked with one inch less empty space than the calculations had predicted. This allowed room for some overflow. If all the books in a certain call number had been moved and there was still empty shelving between the last book and the next call number marker, that space was left empty for shifts in the future.

Setting bookends in proper position

If the shelves into which the books will be moved are already empty, you may wish to place all the bookends on the shelves a little further out on the shelves than the books will be. This will save the bookmovers an extra step.

Beginning the move

Logistics sheet

Prepare a logistics sheet before the move that specifies what sections of books will be moved on which days. Although situations may develop to alter these plans (e.g., elevator down for the day), having a schedule is a necessity.

Goal markers

Especially with large jobs, the bookmovers can easily become discouraged by the enormity of their task. Setting goal markers for each crew every day can provide some motivation. If you hope to move 46 sections of books, display a brightly colored goal

marker at Section 46. Many of our crews were quite proud of how far past a goal marker they could move in one day.

Logsheet

Recording the daily progress of each crew and charting the next day's activities is important.

Crew performance

Information from the logsheet can be used to chart crew performance over a period of time. These charts were updated daily, posted in the mover's break room, and helped maintain morale.

Problems

Even the best laid plans can go astray. Some typical problems include:

a) The bookmovers may end a section and continue into a wrong next section. The professional responsible for the move must be constantly aware of critical decision points and prevent mistakes before they occur.

b) An inaccurate book measurement may result in a section of books continuing into shelving planned for other books. This can be remedied by quickly calculating the overrun and decreasing the amount of empty shelf space in the next section to accommodate it. In this situation the dots indicating empty shelf space that were placed at the top of each shelving unit can be reset to the corrected spacing.

c) Boredom may set in. Goal markers and daily progress charts clearly were a helpful motivating factor. But the fact remains that bookmoving is a tedious, tiring job. (Occasional treats can boost morale!) Regular supervision can detect warning signs of boredom and allow for a change of tasks or crew members.

Patrons are usually very understanding during a book move, especially if it takes place during a low use time of year. Daily postings of which sections have been moved, where they have been moved to, and which sections are in the process of moving are all helpful to patrons. Smaller signs should be posted on the end-panels of the emptied stacks indicating where the moved books can be found.

Final adjustments

Small shifts, adjustments, and fine tuning will probably be required in the months after the move. But the major shift has been completed, with appropriate flow, evenly spaced growth space, and well planned blocking of groups of call numbers—a huge accomplishment that will benefit the library and its users for many, many years.

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