

# Availability

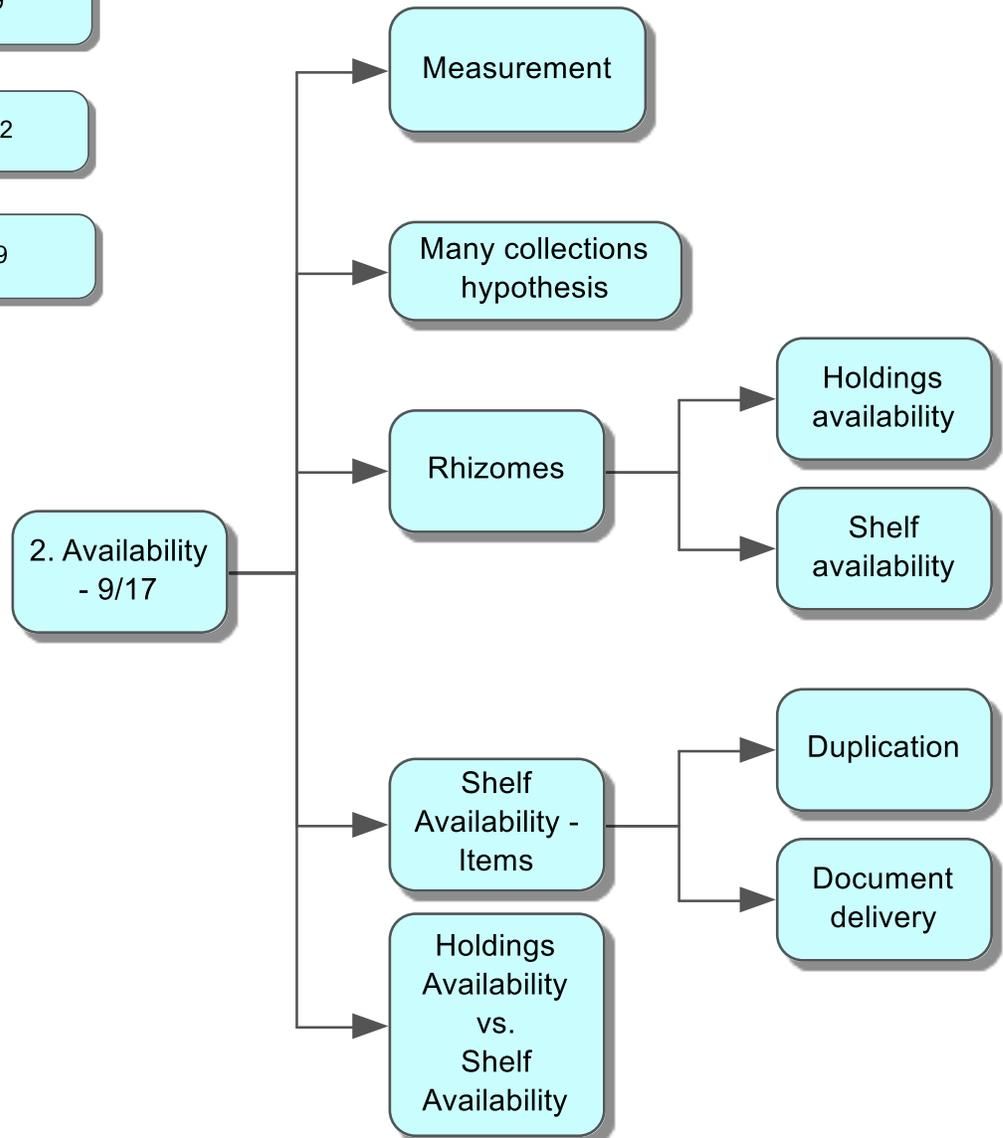
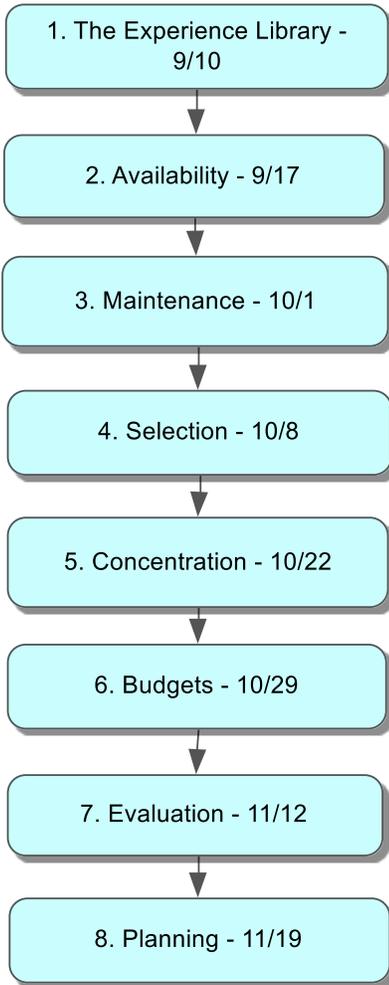
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## Terms

**Arrival time:** The mean time between arrivals of persons seeking a service (or text, in the case of library collection availability).

**Availability:** A measure of collection performance based on the ratio of successful searches to the total searches made by readers: the proportion of readers who find texts that satisfy their purpose for using the collection.

**Brief Test:** A method for testing the holdings availability of a rhizome through the use of a scaled checklist.

**Collection in Use:** A snapshot of the items of a collection that are in use at a particular moment in time. The characteristics of the collection in use are stable over time and provide direct insight into reader demand.

**Holdings Availability:** The proportion of items that a reader looks for that are owned by the library.

**Mean:** The arithmetic average of a set of values. Obtained by adding all the values together and dividing by the count of the values.

**Median:** The midpoint of a set of values. Obtained by arranging the values in numeric order and selecting the middle value. Useful in collections work because it gives a useful sense of the central tendency in distributions with significant outliers, such as the age of a collection.

**Original circulations:** Annual circulations without renewals. If these data are not available directly, sample the percentage of renewals for each rhizome to obtain a correction factor to apply to the reported circulation. Circulation reported with renewals may be used, but the demand estimates will be higher than actual demand.

**Random Availability:** Snapshot ratio of copies on shelf to total copies owned, by rhizome. The proportion of holdings that we would expect to be on the shelf for a particular rhizome if circulation were distributed randomly over the rhizome.

**Ratio:** A ratio shows the relative size of two or more values. In collections work, ratios are generally expressed as a decimal proportion of the total of the values.

**Reader-weighted Availability:** Ratio of copies on shelf to total copies owned, adjusted to reflect reader demand. Generally, the proportion of holdings that a reader is interested in that is on the shelf when that reader uses the library.

**Relative Use:** For a rhizome or group of rhizomes, compares the ratio to total circulation to the ratio for other possible indicators. Most often a comparison of circulation to holdings, but other indicators might include interlibrary loans, reserves, or annual additions. Used to identify over-used and under-used collection categories, which may indicate under-selection or over-selection.

**Rhizome:** A free-form category of texts, readers, and/or any other element that is of interest in collections work. Rhizomes do not depend on hierarchical relationships or conventionally organized category schemes, although they encompass the elements in such schemes. They depend on patterns of networked associations that are not necessarily consistent or logical. Rhizomes do not need to be uniformly organized or mutually exclusive. The same element may be in different rhizomes; rhizomes may intersect, nest, and coexist; terms referring to rhizomes may not be parallel. The point is to identify sets of collection elements with critical linkages that prompt meaning and repay attention, rather than to fix a systematic classification of the elements. The World Wide Web is an example of a body of texts organized rhizomatically.

**Shelf Availability:** The proportion of items owned by the library that are on the shelf when a reader looks for them, adjusted for reader demand.

**Snapshot:** A snapshot is a download of status data about the items in a collection at a specific instant in time. Because status data cycle slowly over loan periods, snapshots provide stable indicators of long-term relationships and trends.

**Turnover:** Turnover is the mean annual circulation per item of a rhizome.

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## Relative Use

Collection	Holdings	Circulation	Holdings Ratio	Circulation Ratio	Relative Use
Youth	8,000	19,500			
Adult	20,000	21,000			
Media	5,000	16,000			
Total	33,000	56,500			

## Reader-Weighted Availability: Sample from the collection in use

Collection	Collection in Use		Availability		% Change
	No. of items in sample		1999	1997	
	Out 2/22/99	On Shelf 4/27/99			
Young Adult	970	608		n.a.	
<b>YS Nonfiction</b>	<b>2,611</b>	<b>2,069</b>		<b>.69</b>	
YS Fiction	1,148	902		.77	
Picture Books	5,745	3,196		.46	
J Paperbacks	1,008	616		.46	
<b>Audio discs</b>	<b>4,461</b>	<b>1,988</b>		<b>.48</b>	

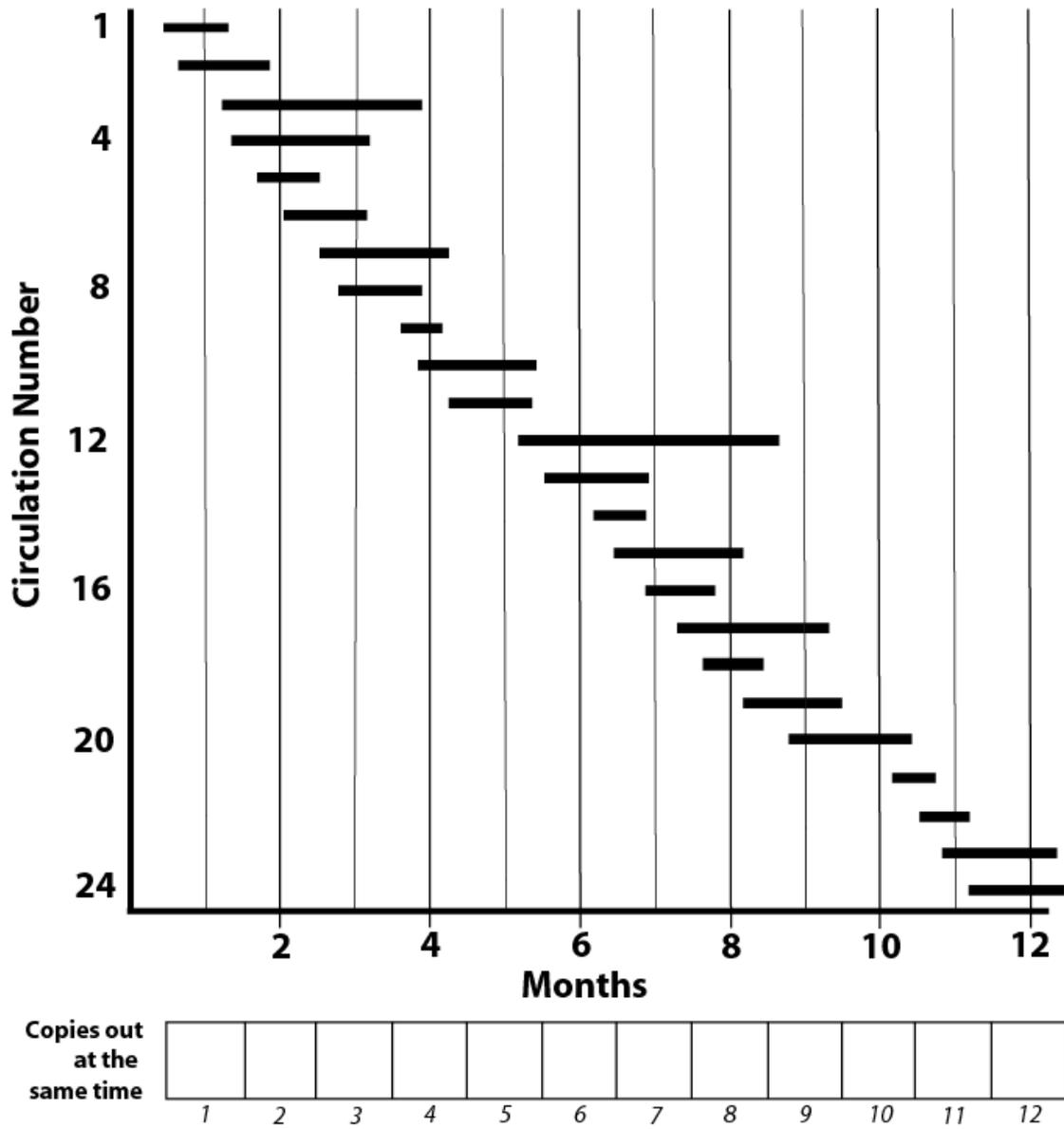
Reader-Weighted Availability, Estimate from Demand Tables:  
Turnover, Demand Per Item, Total Demand

1. Collection	2. Number of Items	3. Original Circulation	4. Turnover	5-6. Loan Period	7. Demand per item Table	8. Total Demand
Picture Books	3,843	16,199		3 weeks		
Board Books	407	2,536		3 weeks		
Videos	1,127	10,949		1 week		
DVDs	805	13,015		1 week		
Audiobooks - tapes	1,005	2,327		3 weeks		
Audiobooks - CDs	438	971		3 weeks		

Reader-Weighted Availability, Estimate from Demand Tables:  
Reader-Weighted Availability

1. Collection	3. Original Circulation	8. Total Demand (above)	Reader-Weighted Availability
Picture Books	16,199		
Board Books	2,536		
Videos	10,949		
DVDs	13,015		
Audiobooks - tapes	2,327		
Audiobooks - CDs	971		

# Typical arrival times and circulation periods



# Duplication Tables

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*Duplication tables are used to estimate how many copies of a title will provide specified levels of availability: 50% (minimal), 68% (moderate), or 95% (full). Unlike other duplication systems, this approach is based on objective data from your own collection. The underlying formula is a simple tool crib model from the operations research literature. The estimate is calculated from the annual circulation totals in your library for the title itself, if that is available; from the annual circulation of the last title published by an author; or from the title turnover for a format, genre or topic.*

## **Use Duplication Tables with existing titles and new purchases**

These Duplication Tables will help you decide how many additional copies you need for high-demand titles in the existing collection. You may also use the tables to determine the number of duplicates for new fiction titles and picture books as you select them. High-demand topics in nonfiction also repay routine initial review.

Applying the tables in this way helps you anticipate demand rather than waiting for reserves to accumulate before adding copies. It also identifies mid-list authors and topics that may benefit from moderate duplication. This will boost the perceived variety of your collection, and can result in higher overall circulation than more extensive duplication of a few best-sellers.

## **Estimates will change to meet demand**

The tables are sensitive to changes in demand, but the estimate is limited by the actual number of circulations in your

library's records for the title, author, or other factor that you investigate. If there is high unsatisfied demand, the existing records may not reflect total demand, and so the duplicate estimate may not be sufficient to meet the predicted level of availability. For this reason it is important to recalculate the estimates when a new title is issued by an author or after additional copies of an existing title have circulated for 6 months to a year.

Once demand is reflected accurately in the circulation record, the estimate will level out. The system is self-balancing in both directions; if demand for an author decreases, this reduces circulation totals and the duplication estimate will decrease.

## **Use annual circulation estimates**

You must use annual circulation estimates with the tables; the underlying calculations assume one year's worth of data. If you have less (or more) than a year of data, annualize the totals by finding a monthly average and then multiplying by 12.

## How to use the tables

### I. Estimate the annual circulation for the title.

#### A. If you already own copies:

Determine the annual number of circulations by adding together the most recent annual circulation of all copies of the title that you own. Use the raw total of the circulations, not the average per copy.

**OR**

#### B. If you do not already own copies:

If you have other titles in the collection by the same author, determine the annual number of circulations for the most recent title in your collection by the author, as in “A” above. If the author writes in more than one genre, or publishes both fiction and nonfiction, you may also want to check the most recent title in the genre or format that most clearly matches the title at hand to take into account any variations in demand

**OR**

If the author is new to your collection, determine the title turnover for the format, genre, or topic. The title turnover is the average annual circulation of the *titles* (not copies). If title turnover cannot be calculated, you can use copy turnover, but doing so may underestimate the number of copies needed if the collection has a high ratio of copies to titles.

### II. Use the Duplication Tables to find the number of copies you need:

#### A. Decide which table to use.

The tables are arranged by 1-week, 2-week, 3-week, and 4-week standard loan periods, then by the percentage of availability that you wish to achieve. Select the table that corresponds to the standard loan period for the title you are concerned with. Then choose 50% availability for minimal duplication, 68% availability for moderate duplication, or 95% availability for full duplication. You may also use the underlying formula to estimate 99% availability for an “always available” level of duplication.

#### B. Look up the number of copies in the table.

Locate the annual number of circulations you determined in Step 1 in the column labeled “Circs.” The number in the column to the right (“Copies”) is an estimate of the total number of copies you need for the availability level you have selected. If you already own copies of the title, subtract those from the copy estimate to determine the number of copies to add.

Separate tables show the number of copies needed for 50%, 68%, and 95% availability.

There are two pages for each availability level, covering titles with 1-300 and 301-600 circulations.

Tables are provided for 7, 14, 21, and 28 day loan periods

**Loan Period: 21 Days    Availability: 68%    Circulations: 1 - 300**

Circ	Copies										
1	1.1	51	5.3	101	9.6	151	13.8	201	18.1	251	22.3
2	1.2	52	5.4	102	9.7	152	13.9	202	18.2	252	22.4
3	1.3	53	5.5	103	9.7	153	14.0	203	18.2	253	22.5
4	1.3	54	5.6	104	9.8	154	14.1	204	18.3	254	22.6
5	1.4	55	5.7	105	9.9	155	14.2	205	18.4	255	22.7
6	1.5	56	5.8	106	10.0	156	14.2	206	18.5	256	22.7
7	1.6	57	5.8	107	10.1	157	14.3	207	18.6	257	22.8
8	1.7	58	5.9	108	10.2	158	14.4	208	18.7	258	22.9
9	1.8	59	6.0	109	10.3	159	14.5	209	18.7	259	23.0
				110	10.3	160	14.6				23.1
				111	10.4	161	14.7				23.2
				112	10.5	162	14.8				23.3
				113	10.6	163	14.8				23.3
				114	10.7	164	14.9				23.4
				115	10.8	165	15.0				23.5
				116	10.9	166	15.1	216	19.3	266	23.6
				117	10.9	167	15.2	217	19.4	267	23.7
				118	11.0	168	15.3	218	19.5	268	23.8
				119	11.1	169	15.4	219	19.6	269	23.8
				120	11.2	170	15.4	220	19.7	270	23.9
				121	11.3	171	15.5	221	19.8	271	24.0
				122	11.4	172	15.6	222	19.9	272	24.1
				123	11.4	173	15.7	223	19.9	273	24.2
				124	11.5	174	15.8	224	20.0	274	24.3
25	3.1	75	7.4	125	11.6	175	15.9	225	20.1	275	24.4
26	3.2	76	7.5	126	11.7	176	15.9	226	20.2	276	24.4
27	3.3	77	7.5	127	11.8	177	16.0	227	20.3	277	24.5
28	3.4	78	7.6	128	11.9	178	16.1	228	20.4	278	24.6
29	3.5	79	7.7	129	12.0	179	16.2	229	20.4	279	24.7
30	3.5	80	7.8	130	12.0	180	16.3	230	20.5	280	24.8
31	3.6	81	7.9	131	12.1	181	16.4	231	20.6	281	24.9
32	3.7	82	8.0	132	12.2	182	16.5	232	20.7	282	25.0
33	3.8	83	8.0	133	12.3	183	16.5	233	20.8	283	25.0
34	3.9	84	8.1	134	12.4	184	16.6	234	20.9	284	25.1
35	4.0	85	8.2	135	12.5	185	16.7	235	21.0	285	25.2

**Circ:** In your library's circulation records, find the number of circulations for A) all copies of the title you already own, or B) if you don't already own the title, all copies of the last title published by the author. If there are no author data, use the title turnover of the format, genre or topic of the title. Estimate the number of annual circulations in the last year from the data.

**Copies:** This column shows the number of copies you need to meet the specified availability level, including any copies you already own.

## Tips for Using the Tables

1. Over time, multiple copies of a title tend to have nearly the same number of circulations. If there are copies that have significantly lower circulation, they are probably missing. If they have been missing less than a year, convert their circulation to the average for the remaining titles and add that estimate to the total.
2. The tables require that the circulation estimate be annualized. If you have less than a year's worth of data for a title, convert the circulation to a full year by calculating a daily average and multiplying by 365. Keep in mind that the first few months of circulation are ordinarily the highest in the life of a title, and so estimates derived from just a few months of activity may be high. You need at least 4-6 months of data to be reasonably accurate. You can also use the technique of estimating annual circulation from a daily average if you have more than a year's worth of data, but beyond 18-24 months of circulation, the estimate may be too low to account for initial demand.
3. Fiction genre titles, such as mysteries and science fiction, tend to have an initial high circulation, but subside quickly once most avid followers of the genre have read the title. Be conservative about adding genre duplicates until you are familiar with the patterns for your own library. New titles in nonfiction should also be duplicated with caution until you have a sense of the underlying long-term demand.
4. Calculate the duplicates for multiple-branch libraries by determining the total number of copies needed for the system as a whole. Sum the annual circulation for all copies at all branches, and use that total to find the number of copies in the Duplication Tables. Allocate copies among branches by the share of total system circulation for the format, genre, or topic at each branch. This method favors larger branches, so it is wise to round up the estimate for smaller branches to the nearest full copy.
5. The tables may be used to estimate the number of copies of an older title to keep when you are weeding. Determine the most recent annual circulation for all copies of the title, and use that total to find the corresponding number of copies in the Duplication Tables. If you cannot determine the most recent annual circulation, use the average annual circulation over the life of the title. That will slightly overestimate the number of copies needed.

As you have already purchased the copies, this might be an instance when you apply a 99% availability rate, which you can calculate using the duplication formula in the Appendix. When you weed the extra copies, examine each one and discard those in the worst physical condition.
6. The tables provide estimates for titles with 1-600 annual circulations. If you have more than 600 annual circulations for a title, divide the total circulations into increments of 600 plus any remainder. Look up the copy estimates for 600 circulations and for the remainder. Multiply the estimate for 600 circulations by the number of increments of 600 that you have, and then add the estimate for the remainder. This will give you the total number of copies needed. This method works because at higher levels of circulation,

the formula is linear. The number of circulations and duplicates increase directly, at essentially the same rate.

7. Many libraries establish a copy per title maximum beyond which they buy no duplicates, no matter how high the demand. With the use of such a maximum as an indicator of the outer boundary of a library's duplication effort, it is possible to construct a scaled duplication table for a specific library. Such a table provides an initial high level of duplication (95% or 68% availability) for titles that are mid-range in demand, and then gradually reduces the duplication level to that of 50% availability, terminating at a maximum of the library's choosing. If you are interested in pursuing such an approach, contact Roy Kenagy: (515) 419-3394, [rjkenagy@netins.net](mailto:rjkenagy@netins.net).
8. The Duplication Tables are based on a formula from the operations research literature used to solve the "tool crib" problem: estimating the number of shared tools required in a workplace to ensure that all workers are supplied with tools as needed, but that the tools are not oversupplied. The model makes use of the Expectation of Life formula, which underlies many of the mathematical relationships in collections work. The Appendix sets out both formulas and provides worksheets and article citations to aid in understanding them.
9. To make the tables easily accessible to libraries without requiring additional local research, I have applied several assumptions to the tool crib model. These assumptions, supported by empirical research by myself and others, are:
  - 1) the average recorded loan period of an item is roughly equal to the standard loan period for the item;

- 2) loan periods follow the normal distribution;
- 3) the standard deviation for the length of loan periods is around 10 days; and
- 4) items with identical loan periods and similar circulation histories will follow similar demand patterns.

If a library prefers to research and implement the exact tool crib variables for their own collections, the key measures are the mean and standard deviation for the recorded length of loans in each of the collections they wish to model.

10. I have introduced a constant of one copy to the tool crib model, again based on empirical experience. This front-loads the number of copies at initial levels of demand. The modification is a form of priming the breadth of the experienced collection, supporting variety at the shelf for browsing, and encouraging the circulation of mid-range authors and topics that are under-developed in conventional duplication practice concentrated on best sellers.
11. The tables account for circulations resulting from browsing as well as known-item requests. However, if circulation interference has resulted in annual circulation totals that underrepresent the demand for a title, the estimated number of copies may still be low. As an author publishes subsequent titles, this will tend to correct itself as the estimate comes closer to the satisfaction level. The tables also function in reverse: as demand for an author or topic decreases, the number of estimated copies will decrease. The estimates are not static, and should be revisited whenever a new title is published.