

Appendix 4: Explanation of Payback Period (ROI) Calculations in Appendices 5-8

Annual Circulation: Begin with circulation as reported by library based on 2007/08 fiscal year and increase it annually, as follows: For Main Library, increase by 3% annually. For Mitchell Park Library, increase by 50% the first year after reopening, then by 5% annually for four years, then by 3% annually. For Children's Library, increase by 5% annually for three years, and then remain static.

Open Days per Year: Number of days per year the library is open based on current schedule.

Open Hours per Week: Number of hours per week the library is open based on current schedule.

Weekly Circ: Weekly circ is calculated based on the above numbers as follows:

$$\frac{\text{Annual Circ}}{\text{Open Days / Year}} \times 7 \text{ (days a week)}$$

Hourly Circ: Even though the flow of material fluctuates during the day, we will use an average hourly circ based the following formula:

$$\frac{\text{Weekly Circ}}{\text{Open Hours / Week}}$$

Current Time Spent on Check-in: Number of staff hours spent doing check-in currently. Increase in staffing incremented at same rate as circulation each year.

Circ Staff Hourly Rate: Current hourly cost of circulation staff including overhead costs. This is increased by 3% annually.

Current Staffing Costs (annual): Calculated based on the following formula:

$$\text{Staff hours per week} \times \text{Hourly Rate} \times 52 \text{ (weeks per year)}$$

Total Sorter Capacity: Number of items that can be sorted into bins based on daytime configuration of sorter. After hours, higher capacity trolleys would be used in place of the lower volume delivery totes.

Adjusted Sorter Capacity: Total sorter capacity is divided in half to establish a threshold volume that will be reached when a bin needs to be swapped out. If the sorter loaded each bin evenly, this number could be a higher percentage of the total sorter capacity. Half seems like a reasonable number to use when accounting for higher volumes of some kinds of material than others (e.g. children's books that may all be sorted to the same bin).

Sorter Induction Speed: Speed at which a staff person can induct material into the sorter (based on manufacturer's estimate).

Hours to reach adjusted capacity: Based on the average hourly circulation (number of items being returned), the number of hours the sorter can go unattended before reaching its adjusted sorter capacity. This is calculated as follows:

$$\frac{\text{Adjusted Sorter Capacity}}{\text{Hourly Circ}}$$

Required Staff Time (hours per week): If staff have to work a minimum one hour shift each time the sorter reaches adjusted capacity, how many hours will staff need to be assigned to the sorter in order to ensure that bins are swapped out as needed (based on the adjusted sorter capacity). This is calculated as follows:

$$\frac{\text{Open hours per week}}{\text{Hours to reach adjusted capacity}}$$

This is a generous estimate, since tasks related to inducting and removing items from a full sorter should take substantially less than one hour.

Induction hours: This is the maximum number of staff hours that will be committed to feeding material into the sorter to keep up with the number of items being returned and is a subset of the Required Staff Time (above). In truth, this number will be much lower because most returns will come in via the automated check-in system and will not require staff induction at all. The maximum induction hours that would be required (if no self check-in machines were in place) is calculated as follows:

$$\frac{\text{Weekly Circ}}{\text{Sorter Induction Speed (items per minute)} \quad / \quad 60 \text{ (minutes in an hour)}}$$

Staffing Costs (annual): Based on the circulation volume and staffing requirements of the sorter, the annual cost of check-in staff is calculated as follows:

$$\text{Required Staff Time} * \text{Hourly Rate} * 52 \text{ (weeks/year)}$$

Annual Savings: The staffing costs of the current operation are compared to the staffing costs that will be required with the sorter. Annual savings in staff costs are calculated as follows:

$$\text{Staffing Costs (Manual)} - \text{Staffing Costs (automated)}$$

Sorter Cost/Maintenance: In order to determine pay back period, the total purchase cost of the sorter is shown in year one. Each subsequent year, a high estimate is provided for annual maintenance. This number is likely to be smaller because the library will have

more than one sorter to be serviced at a time. Also, this number can be reduced by having local facilities staff handle some of the servicing.

Cumulative Savings: To determine how many years it will take the system to pay for itself, we show the total cost of the equipment paid so far and subtract any staff savings to date. The formula is:

Annual Savings – Sorter Cost and/or Maintenance

Overall Payback (AMH Only): To determine payback period for the AMH system as a whole, given that each library will install AMH sorters at a different time, calculate the overall costs/savings for each fiscal year, beginning with 2012/13.

Overall Payback with RFID Costs: Subtract the cost of RFID (with and without security gates) from the AMH costs/savings for each fiscal year, to determine overall payback of the AMH/RFID project. Additional annual costs of RFID are included in the ROI calculation. These annual costs represent the additional cost of using RFID tags over bar codes.