This is our new automated book drop.

It checks in the books as they're passed through the door, saving us time!

For what, hospital visits?

"Keep your hands and feet away at all times."

As a safety measure, we can't let patrons near the automated book drop.

But because it cost so much, we need to make use of it.

I'm speechless.

Allow me to deposit your book in this labor saving device!

I'll put my books in there myself. Thank you.

Not until you sign this waiver.

How much "grievous bodily harm" could I cause myself?

Let's not find out.

I'm going to complain!

Please be rational and specific. I'd like to get back inside before winter sets in!
A decent sort:
Edmonton Public Library’s decision-making model for automated sortation

Adrienne Canty
LibTech 2010 Conference
March 18, 2010
Precious

The Lord of the Rings: The Return of the King
December 17th
Rollie Buttons (a.k.a. POSH)
“The staffing and material handling benefits of Self-checkin combined with sorting units is dramatic. This backroom work is absolutely necessary, but is invisible, involves no customer interaction and mistakes can create customer service problems. It is the team’s recommendation that all future renovations or expansions allow for room for Self-checkin and sorting. Ideally the same sorting unit could deal with internal and external returns.”

EPL’s RFID Investigation Team final report, May 2005
second principal
length

fo'c's'le (fō'k'zəl) n. pl. fo'c's'les (fō'kész) n. The point to which
converges a. The point to which
converges other optical arrange-
ments are directed. Also for-
Decision-making considerations for locating sortation equipment at EPL

Space requirement
- Will sorter demand additional space not initially planned for? Calculate cost of additional land/leasehold space required, if any, i.e., acquisition cost for land, additional rental lease costs for space.
- Will sorter installation result in diminished public space? Consider "soft" cost of customer impact of lost space.
- Will the space require the conveyer path to include return? If so, consider it a significant negative — straight line paths are less complicated and less expensive.
- Does the available space place the sorter in, or adjacent to, staff work areas? If not, consider it a significant negative. More complicated machinery, e.g., conveyer belts, and/or additional staff time and effort will be required to move materials through the facility for processing.
- Does the available space facilitate a return location for customers that is logical and consistent with traffic flows? Requiring that customers must return to a return location that is inconvenient is a significant negative.
- Does the available space allow the installation of a logically-placed exterior return for customers, feeding directly into the sorter? Consider the requirement of more complicated machinery and or staff time and effort to transport materials to staff work areas a significant negative.

Construction/renovations
- What is the total cost of renovations required for the project? Renovations may include, and may not be limited to, some or all of the following:
  - Physical renovations (e.g., construction of facility extensions, renovations to additional acquire leasehold space, construction/removal/modification of interior/exteriors walls)
  - Infrastructure upgrades (e.g., electrical or HVAC capacity)
  - Physical reorganization of space
  - Noise, climate, temperature, dust and/or other controls
- If facility is leasehold, what renovations are acceptable to the landlord?

Activity cost benchmarks
- Determine the benchmark time required per manual check-in, including all aspects of the transaction that would be automated, removing item from book drop return area, checking in, and moving it to or placing it on a truck or in a bag to be shelved or routed. Extrapolate this figure to the current check-in volume of the branch(es) under consideration. Calculate staffing cost for this time figure, based on Page or Circulation Assistant-level staffing.
- Determine benchmark time required per automatic check-in, sort, and extrapolate to the current calculations of the branch(es) under consideration. Calculate staffing cost for this time figure, based on Page or Circulation Assistant-level staffing.

Total cost of ownership
- One-time costs
  - Purchase of equipment
- Installation
- Ongoing costs
  - Maintenance
  - Upgrades

Soft considerations
Size of location
- Install sorters initially in larger facilities whose check-in activity warrants automation; these are generally locations with larger collections and higher check-in numbers, serving larger populations than smaller locations.

Activity and catchment area population trends
Check in and visit volume
- What is the current check-in volume, and the five-year trend?
- What is the current visit volume, and the five-year trend?
- EPL generally assumes a 30% increase in facility use following a renovation project.
- Install sorters at locations with the highest check-in volumes and greatest visits, likely the branches with the largest collections and greatest number of customers.

Population/population density
- What is the current population and population density of the area surrounding the location, and the five-year trend?
- Place sorters in locations where the greatest population is served and the facility is convenient to the largest number of people.

Expected growth
- What is the 5-year projection for population growth in the area surrounding the location?
- What is the 5-year projection for residential and commercial building projects in the area surrounding the location?
Hard considerations
• Space: available, more required, layout, location?
• Renovations? Reorganization?
• Acceptable leasehold improvements
• Position on capital projects list?
Measuring up

• Activity cost benchmarks
• Anticipated cost savings (if any)
Financial: TCO
• Equipment price
• Additional space
• Renovations
• Installation
• Maintenance
• Upgrades
• Depreciation
• Replacement/life expectancy
Statistics
• Activity levels
• Population/density
• Expected growth
## Financial calculation sheet for EPL Sorter Decision-Making Model

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additional physical space required for sorter</td>
<td>100.00</td>
<td>-</td>
<td>400.00</td>
<td>200.00</td>
</tr>
<tr>
<td>Cost per square foot</td>
<td>$ 50.00</td>
<td>$ 60.00</td>
<td>$ 80.00</td>
<td>$ 65.00</td>
</tr>
<tr>
<td>Acquisition costs of additional land/leasehold space</td>
<td>$ 5,000.00</td>
<td>$ -</td>
<td>$ 32,000.00</td>
<td>$ 13,000.00</td>
</tr>
<tr>
<td>Annual rental/lease cost of additional leasehold space</td>
<td>-</td>
<td>$ 18,000.00</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Construction/renovation costs to accommodate sorter</td>
<td>$ 25,000.00</td>
<td>$ 15,000.00</td>
<td>$ 10,000.00</td>
<td>$ 15,000.00</td>
</tr>
<tr>
<td>Cost of public space lost by installation of sorter (square footage x lease)</td>
<td>$ 10,000.00</td>
<td>$ 1,200.00</td>
<td>-</td>
<td>$ 5,000.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$ 40,000.00</td>
<td>$ 34,200.00</td>
<td>$ 42,000.00</td>
<td>$ 33,000.00</td>
</tr>
<tr>
<td>Initial cost of sortation equipment</td>
<td>$ 70,000.00</td>
<td>$ 90,000.00</td>
<td>$ 70,000.00</td>
<td>$ 110,000.00</td>
</tr>
<tr>
<td>Cost of installation</td>
<td>$ 10,000.00</td>
<td>$ 10,000.00</td>
<td>$ 10,000.00</td>
<td>$ 10,000.00</td>
</tr>
<tr>
<td>Annual cost of maintenance</td>
<td>$ 5,000.00</td>
<td>$ 7,000.00</td>
<td>$ 5,000.00</td>
<td>$ 9,000.00</td>
</tr>
<tr>
<td>Annual cost of upgrades/extras</td>
<td>$ 1,200.00</td>
<td>$ 1,400.00</td>
<td>$ 1,200.00</td>
<td>$ 1,600.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$ 86,200.00</td>
<td>$ 108,400.00</td>
<td>$ 86,200.00</td>
<td>$ 130,600.00</td>
</tr>
<tr>
<td>Total costs associated with sorter installation</td>
<td>$ 126,200.00</td>
<td>$ 142,600.00</td>
<td>$ 128,200.00</td>
<td>$ 163,600.00</td>
</tr>
<tr>
<td>Annual check-ins at service point</td>
<td>50,000</td>
<td>65,000</td>
<td>40,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Benchmark time required per manual check-in (minutes)</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>Annual time spent on manual check-in (minutes)</td>
<td>10,000</td>
<td>13,000</td>
<td>8,000</td>
<td>14,000</td>
</tr>
<tr>
<td>Annual cost of manual check-ins (LA, step C)</td>
<td>$ 257,300.00</td>
<td>$ 334,490.00</td>
<td>$ 205,840.00</td>
<td>$ 360,220.00</td>
</tr>
<tr>
<td>Benchmark time required per automated check-in (minutes)</td>
<td>0.15</td>
<td>0.15</td>
<td>0.15</td>
<td>0.15</td>
</tr>
<tr>
<td>Annual time spent on automated check-in (minutes)</td>
<td>7,500</td>
<td>9,750</td>
<td>6,000</td>
<td>10,500</td>
</tr>
<tr>
<td>Annual cost of automated check-ins (LA, step C)</td>
<td>$ 192,975.00</td>
<td>$ 250,867.50</td>
<td>$ 154,380.00</td>
<td>$ 270,165.00</td>
</tr>
<tr>
<td>Potential annual time saved by installation of sorter (minutes)</td>
<td>2,500</td>
<td>3,250</td>
<td>2,000</td>
<td>3,500</td>
</tr>
<tr>
<td>Potential annual cost saved by installation of sorter</td>
<td>$ 64,325.00</td>
<td>$ 83,622.50</td>
<td>$ 51,460.00</td>
<td>$ 90,055.00</td>
</tr>
<tr>
<td>Approximate time required to achieve 100% ROI of first year’s expenditure (years)</td>
<td>1.96</td>
<td>1.71</td>
<td>2.49</td>
<td>1.82</td>
</tr>
<tr>
<td>Maximum number of bins/sorts that can be accommodated</td>
<td>5</td>
<td>7</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>FTEs</td>
<td>11.5</td>
<td>12.3</td>
<td>9.2</td>
<td>10.6</td>
</tr>
</tbody>
</table>
Logistical

- Intended outcomes
- Project triangle: small, cheap, complex
- Bin numbers/sort matrices
- Floating/static collections
- All manufacturers, equipment, options
Financial
• Manual vs. machine check-in
• Space
• Renovations/reorganization
• Bin numbers/sort matrices
• Floating/static collections
• All manufacturers, equipment, options
Workflow

• Staff complement: adjust standard
• Redistribution *may* result in FTE savings
• “Machine expert” portfolio
• Independent operation unlikely
• Staff response: YMMV
• Ergonomic advantages?
Physical
• Size
• Renovations
• Customer return location
• Proximity to key areas, individuals
• Customer training
Equipment

• Physical space requirements
• Future expansions
• Visibility
• Straight lines: good
• Environmental controls
Operational

• Hours of service
• Activity volume
• Population/density/growth
• Proximity
• Customer goodwill
• Location and surroundings
Other
• Collective Agreement/job descriptions
• Blueprint accuracy (Otto)
• Centralized vs. multiple installations
Percentage of check-ins performed by sorter, sorter locations only

- January: 89%
- February: 59%
- March: 63%
- April: 64%
- May: 67%
- June: 78%
- July: 85%
- August: 87%
- September: 89%
- October: 89%
- November: 88%
- December: 89%

2009 (blue bars), 2010 (red bars)
Percentage of check-ins processed by sorters, system-wide

<table>
<thead>
<tr>
<th>Month</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>20%</td>
<td>56%</td>
</tr>
<tr>
<td>February</td>
<td>35%</td>
<td>56%</td>
</tr>
<tr>
<td>March</td>
<td>34%</td>
<td>37%</td>
</tr>
<tr>
<td>April</td>
<td>37%</td>
<td>37%</td>
</tr>
<tr>
<td>May</td>
<td>36%</td>
<td>37%</td>
</tr>
<tr>
<td>June</td>
<td>42%</td>
<td>46%</td>
</tr>
<tr>
<td>July</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>August</td>
<td>52%</td>
<td>52%</td>
</tr>
<tr>
<td>September</td>
<td>53%</td>
<td>53%</td>
</tr>
<tr>
<td>October</td>
<td>54%</td>
<td>54%</td>
</tr>
<tr>
<td>November</td>
<td>54%</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td>54%</td>
<td></td>
</tr>
</tbody>
</table>
Lessons learned

• Processing speed
• Return ports
• Cushions
• “Care and feeding”
• Item-specific issues
Adrienne Canty
Manager, Research & Assessment
Edmonton Public Library
780.442.0241
acanty@epl.ca