

Financial Analysis of *The Smart Box™ System* versus Traditional "Mixed Vaulting" of Bus Farebox Revenue

In the examples provided below, a financial picture of two methodologies of processing of bus farebox revenues is presented. Assumptions have been made based upon observed practices in the mass transit industry.

Two examples are provided:

Example 1. A property operating 100 buses from a single garage location and using a "through-wall" type of cashbox or vault system.

Example 2. A property operating 500 buses from two garages and using mobile vaults for mixed vaulting operations or a cashbox cart for a cashbox audit system.

Assumptions:

1. In "mixed vaulting" systems, garage revenue service requires four (4) steps: 1) data probing of the farebox, 2) removal of the cashbox from the farebox, 3) insertion of a new, empty cashbox into the farebox, and 4) emptying the revenue from the removed cashbox into a revenue collection vault.
2. In The Smart Box™ System, garage revenue service consists of a maximum of three (3) steps: 1) data probing of the farebox, 2) removal of the cashbox from the farebox, and 3) insertion of a new, empty cashbox into the farebox.
3. In The Smart Box™ System, if cashbox removal is not required, garage revenue service consists of a single step: data probing of the farebox.
4. The Smart Box™ System employs *revenue service thresholds* to reduce the number of cashbox exchanges during garage revenue service. *Revenue service thresholds* allow transit companies to define when cashbox exchanges are required during garage revenue service based upon the contents of the cashbox, the number of days since last cashbox exchange, etc.
5. "Mixed vaulting" systems do not stack and face the bills, so bills must be hand stacked and faced prior to counting. After bills are stacked and faced, all revenue can be counted using industry standard bill and coin counting equipment.
6. In The Smart Box™ System, cashboxes are opened, emptied, and counted in a single operation in the money room. Bills and coins are counted using industry standard automated bill and coin counting equipment. Bills are stacked and faced in the cashbox, so no hand stacking and facing is required prior to counting. All bill and coin counting equipment is connect to the Money Room Computer of The Smart Box™ System, so all cashbox count information is automatically captured and sent to the Central Host Computer.
7. Since \$1 bills represent 99% of the bills accepted by fareboxes, the calculations assume all bills to \$1 bills.

Costs Used In Calculations

| Description | Example 1 | | Example 2 | |
|--|-------------|---------------------------|-------------|---------------------------|
| | Cost | Unit | Cost | Unit |
| Garage Revenue Clerk cost, including salary and benefits | \$20.00 | Hour | \$25.00 | Hour |
| Money room clerk cost, including salary and benefits | \$20.00 | Hour | \$25.00 | Hour |
| Bus operator cost, including salary and benefits | \$25.00 | Hour | \$30.00 | Hour |
| Management/Supervisory personnel cost, including salary and benefits | \$35.00 | Hour | \$40.00 | Hour |
| Bus operating cost | \$10.00 | Hour | \$10.00 | Hour |
| Money room transport vehicle, including one (1) driver and one (1) security guard | \$35.00 | Hour | \$45.00 | Hour |
| Money room transport vehicle travel time | 2.0 | Hours per garage | 2.0 | Hours per garage |
| Bill hand stacking & facing rate | 900 | Bills per Hour | 1,200 | Bills per Hour |
| Revenue service bus dwell time - traditional vaulting with probing, cashbox exchange, dumping of cashbox into revenue collection vault | 3 | Minutes | 3 | Minutes |
| Revenue service bus dwell time, probing only - The Smart Box™ System | 1 | Minutes | 1 | Minutes |
| Revenue service bus dwell time, probing & cashbox exchange, The Smart Box™ System | 1.5 | Minutes | 1.5 | Minutes |
| Percentage of cashbox exchanges compared to total number of probings for The Smart Box™ System | 20% | Percent of total probings | 25% | Percent of total probings |
| Rate at which cashboxes are emptied and counted in the money room in The Smart Box™ System | 1 | Per minute | 1 | Per minute |
| Counting rate for bills for traditional (mixed vaulting) systems, after bills are stacked and faced | \$30,000.00 | Per hour | \$30,000.00 | Per hour |
| Counting rate for coins for traditional (mixed vaulting) systems | \$15,000.00 | Per hour | \$15,000.00 | Per hour |
| Number of supervisory hours per clerk hour | 0.25 | Hours | 0.2 | Hours |

Example Number One

Property number one operates 100 transit buses from a single location. Fixed route service is operated seven days a week and revenue per bus per day averages \$100, with 70% of this is \$1 bills. For this example, the costs associated with transfers, monthly passes, day passes, etc. will not be examined as they will be approximately equal for both types of operations.

| | |
|--------------------------------------|----------|
| Number of Buses | 100 |
| Number of Garages | 1 |
| Operating Days per Week | 7 |
| Average daily cash per bus | \$100.00 |
| Bills as percentage of total revenue | 70% |

Example One - Traditional "Mixed Vaulting" System*Garage Revenue Service Costs*

Revenue Service Time

Minutes per bus 3

Man Hours per day for revenue service 5.00

| | | Cost per Day | Cost per Week | Cost per Year | % of Total Cost |
|--|------|-------------------------|--------------------------|--------------------------|----------------------------|
| Cashbox Probe & Exchange, Bus Operator Cost | | \$125 | \$875 | \$45,500 | 22.5% |
| Cashbox Probe & Exchange, Revenue Clerk Time | | \$100 | \$700 | \$36,400 | 18.0% |
| Cashbox Probe & Exchange, Bus Operating Cost | | \$50 | \$350 | \$18,200 | 9.0% |
| Supervisory Hours (for Revenue Clerk) | 1.25 | <u>\$44</u> | <u>\$306</u> | <u>\$15,925</u> | <u>7.9%</u> |
| <i>Total Garage Revenue Service Cost:</i> | | \$319 | \$2,231 | \$116,025 | 57.5% |

Money Room Costs

Cost of hand stacking & facing bills

Number of bills per day 7000

Hours per day stacking & facing bills 7.78

Cost to count bills after stacking & facing

Number of bills per day 7000

Hours per day to count bills 0.23

Cost to count coins

Daily coin value \$3,000.00

Hours per day to count coins 0.2

Supervisory Hours (for Money Room Clerk)

2.05

Total Money Room Costs:\$72 \$503 \$26,152 12.9%

\$236 \$1,652 \$85,929 42.5%

Total Cost for Mixed Vaulting:**\$555 \$3,884 \$201,954 100.0%**

Example One - The Smart Box™ System

Garage Revenue Service Costs

Revenue Service Time

| | |
|---|------|
| Minutes per bus, probing only | 1 |
| Number of buses per day, probing only | 80 |
| Total hours per day, probing only | 1.33 |
| Minutes per bus, probe & cashbox exchange | 2 |
| Number of buses per day, probing & cashbox exchange | 20 |
| Total hours per day, probe & cashbox exchange | 0.50 |

| | | Cost per Day | Cost per Week | Cost per Year | % of Total Cost |
|--|------|-------------------------|--------------------------|--------------------------|----------------------------|
| Cashbox Probe Only, Bus Operator Cost | | \$33 | \$233 | \$12,133 | 26.4% |
| Cashbox Probe Only, Revenue Clerk Time | | \$27 | \$187 | \$9,707 | 21.1% |
| Cashbox Probe Only, Bus Operating Cost | | \$13 | \$93 | \$4,853 | 10.5% |
| Cashbox Probe & Exchange, Bus Operator Cost | | \$13 | \$88 | \$4,550 | 9.9% |
| Cashbox Probe & Exchange, Revenue Clerk Time | | \$10 | \$70 | \$3,640 | 7.9% |
| Cashbox Probe & Exchange, Bus Operating Cost | | \$5 | \$35 | \$1,820 | 4.0% |
| Supervisory Hours (for Revenue Clerk) | 0.46 | <u>\$16</u> | <u>\$112</u> | <u>\$5,839</u> | <u>12.7%</u> |
| <i>Total Garage Revenue Service Cost:</i> | | \$117 | \$818 | \$42,543 | 92.4% |

Money Room Costs

| | | | | | |
|--|------|------------|-------------|----------------|-------------|
| Cost of counting removed cashboxes | | \$7 | \$47 | \$2,427 | 5.3% |
| Time per cashbox | 1 | | | | |
| Total hours per day | 0.33 | | | | |
| Supervisory Hours (for Money Room Clerk) | 0.08 | <u>\$3</u> | <u>\$20</u> | <u>\$1,062</u> | <u>2.3%</u> |
| <i>Total Money Room Costs:</i> | | \$10 | \$67 | \$3,488 | 7.6% |

Total Cost for The Smart Box™ System: \$126 \$885 \$46,031 100.0%

| Costs Reductions Achieved by Using The Smart Box™ System: | Savings per Day | Savings per Week | Savings per Year | Overall Savings |
|--|----------------------------|-----------------------------|-----------------------------|----------------------------|
| | \$428 | \$2,999 | \$155,923 | 77.2% |

Example Number Two

Property number two operates 500 transit buses from two garage locations (250 buses at each location). The money room is located at a third location. Fixed route service is operated seven days a week and revenue per bus per day averages \$100 and 70% of this is \$1 bills. For this example, the costs associated with transfers, monthly passes, day passes, etc. will not be examined as they will be approximately equal for both types of operations.

| | |
|--------------------------------------|----------|
| Number of Buses | 500 |
| Number of Garages | 2 |
| Operating Days per Week | 7 |
| Average daily cash per bus | \$100.00 |
| Bills as percentage of total revenue | 70% |

Example Two - Traditional "Mixed Vaulting" System*Garage Revenue Service Costs*

Revenue Service Time

Minutes per bus 3

Man Hours per day for revenue service 25.00

Cashbox Probe & Exchange, Bus Operator Cost

Cashbox Probe & Exchange, Revenue Clerk Time

Cashbox Probe & Exchange, Bus Operating Cost

Supervisory Hours (for Revenue Clerk) 5.00

Total Garage Revenue Service Cost:

| | Cost per Day | Cost per Week | Cost per Year | % of Total Cost |
|--|-------------------------|--------------------------|--------------------------|----------------------------|
| Cashbox Probe & Exchange, Bus Operator Cost | \$750 | \$5,250 | \$273,000 | 24.7% |
| Cashbox Probe & Exchange, Revenue Clerk Time | \$625 | \$4,375 | \$227,500 | 20.6% |
| Cashbox Probe & Exchange, Bus Operating Cost | \$250 | \$1,750 | \$91,000 | 8.2% |
| Supervisory Hours (for Revenue Clerk) | <u>\$200</u> | <u>\$1,400</u> | <u>\$72,800</u> | <u>6.6%</u> |
| <i>Total Garage Revenue Service Cost:</i> | \$1,825 | \$12,775 | \$664,300 | 60.1% |

Money Room Costs

Cost of hand stacking & facing bills

Number of bills per day 35,000

Man Hours per day stacking & facing bills 29.17

Cost to count bills after stacking & facing

Number of bills per day 35,000

Man Hours per day to count bills 1.17

Cost to count coins

Daily coin value \$15,000.00

Man Hours per day to count coins 1

Supervisory Hours (for Money Room Clerk) 6.27

Total Money Room Costs:

| | | | | |
|---|--------------|----------------|-----------------|-------------|
| Cost of hand stacking & facing bills | \$729 | \$5,104 | \$265,417 | 24.0% |
| Cost to count bills after stacking & facing | \$29 | \$204 | \$10,617 | 1.0% |
| Cost to count coins | \$25 | \$175 | \$9,100 | 0.8% |
| Supervisory Hours (for Money Room Clerk) | <u>\$251</u> | <u>\$1,755</u> | <u>\$91,243</u> | <u>8.2%</u> |
| <i>Total Money Room Costs:</i> | \$1,034 | \$7,238 | \$376,376 | 34.0% |

Transportation Costs

Costs to take money to central counting room

Travel hours 4

\$180 \$1,260 \$65,520 5.9%

Total Cost for Mixed Vaulting:**\$3,039 \$21,273 \$1,106,196 100.0%**

Example Two - The Smart Box™ System

Garage Revenue Service Costs

Revenue Service Time

| | |
|---|------|
| Minutes per bus, probing only | 1 |
| Number of buses per day, probing only | 375 |
| Total hours per day, probing only | 6.25 |
| Minutes per bus, probe & cashbox exchange | 2 |
| Number of buses per day, probing & cashbox exchange | 125 |
| Total hours per day, probe & cashbox exchange | 3.13 |

| | | Cost per Day | Cost per Week | Cost per Year | % of Total Cost |
|--|------|-------------------------|--------------------------|--------------------------|----------------------------|
| Cashbox Probe Only, Bus Operator Cost | | \$188 | \$1,313 | \$68,250 | 20.1% |
| Cashbox Probe Only, Revenue Clerk Time | | \$156 | \$1,094 | \$56,875 | 16.7% |
| Cashbox Probe Only, Bus Operating Cost | | \$63 | \$438 | \$22,750 | 6.7% |
| Cashbox Probe & Exchange, Bus Operator Cost | | \$94 | \$656 | \$34,125 | 10.0% |
| Cashbox Probe & Exchange, Revenue Clerk Time | | \$78 | \$547 | \$28,438 | 8.4% |
| Cashbox Probe & Exchange, Bus Operating Cost | | \$31 | \$219 | \$11,375 | 3.3% |
| Supervisory Hours (for Revenue Clerk) | 1.88 | <u>\$75</u> | <u>\$525</u> | <u>\$27,300</u> | <u>8.0%</u> |
| <i>Total Garage Revenue Service Cost:</i> | | \$684 | \$4,791 | \$249,113 | 73.3% |

Money Room Costs

| | | | | | |
|--|------|-------------|--------------|----------------|-------------|
| Cost of counting removed cashboxes | | \$52 | \$365 | \$18,958 | 5.6% |
| Time per cashbox | 1 | | | | |
| Total hours per day | 2.08 | | | | |
| Supervisory Hours (for Money Room Clerk) | 0.42 | <u>\$17</u> | <u>\$117</u> | <u>\$6,067</u> | <u>1.8%</u> |
| <i>Total Money Room Costs:</i> | | \$69 | \$481 | \$25,025 | 7.4% |

Transportation Costs¹

| | | | | | |
|--|---|-------|---------|----------|-------|
| Costs to take money to central counting room | | \$180 | \$1,260 | \$65,520 | 19.3% |
| Travel hours | 4 | | | | |

Total Cost for The Smart Box™ System: \$933 \$6,532 \$339,658 100.0%

| Costs Reductions Achieved by Using The Smart Box™ System: | Savings per Day | Savings per Week | Savings per Year | Overall Savings |
|--|----------------------------|-----------------------------|-----------------------------|----------------------------|
| | \$2,106 | \$14,741 | \$766,539 | 69.3% |

¹ Decentralization of the money room would eliminate all transportation costs for The Smart Box™ System.