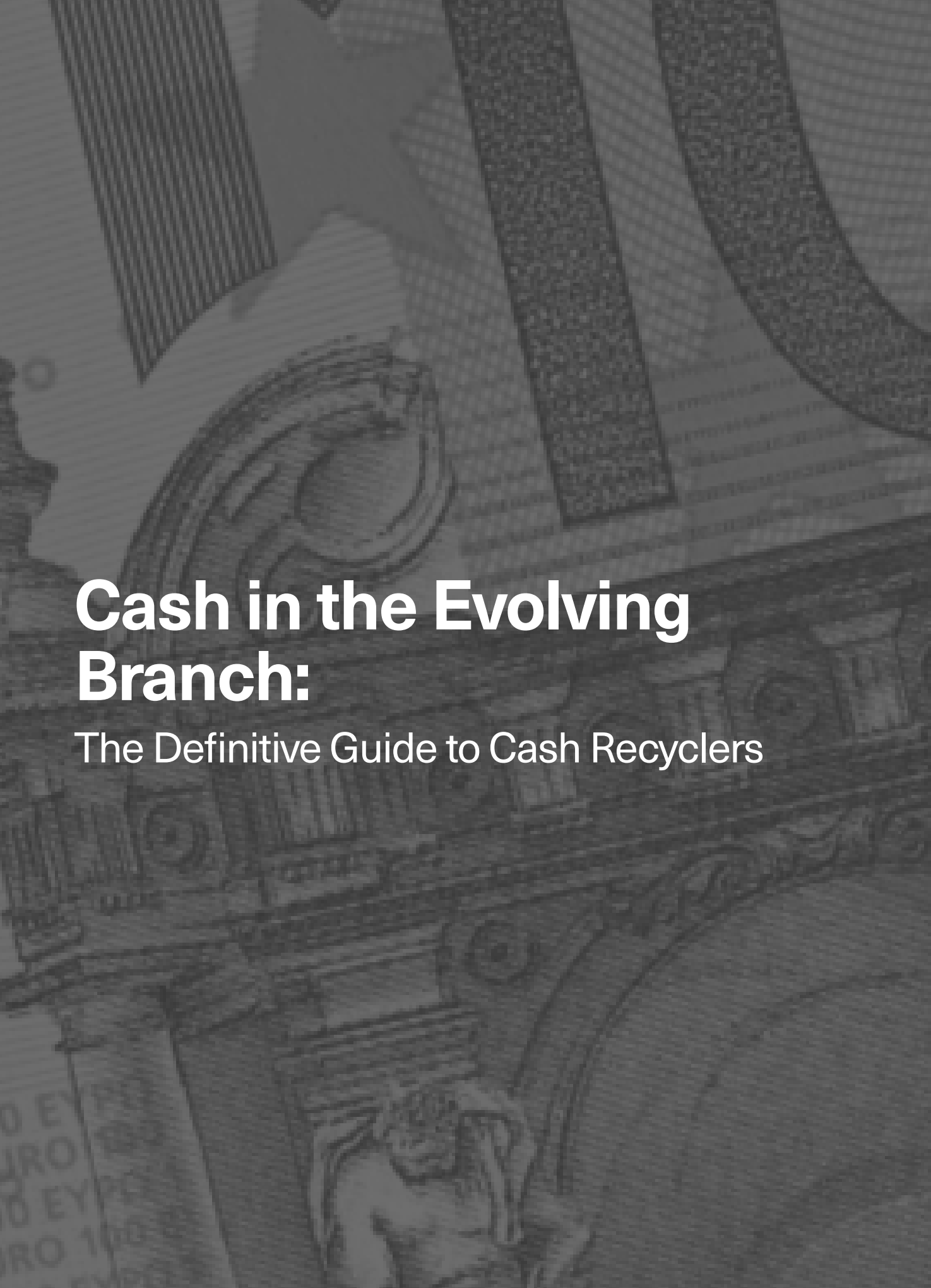


Cash in the Evolving Branch:

The Definitive Guide to Cash Recyclers



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This idea was born while I was talking with banking executives at a popular retail banking trade show. During the multi-day event, I was consistently being peppered with questions about hardware, software, integration, and process changes. This was a good thing, but it also made me think, 'Why are these really smart people asking me basic questions about cash recycling?'

In an effort to provide a little insight into the world surrounding cash recyclers, I tapped my colleagues for answers and expertise . And I added my own experience around cash recycling. There is no possible way to cover everything, but we gave it our best shot.

I hope you enjoy this work of love.

Paige Clark

A handwritten signature in white ink, appearing to read 'Paige Clark', with a stylized, cursive script.



What is a Cash Recycler ?

A cash recycler is a complex machine that automates a couple of simple, but important tasks—accepting and dispensing cash. It also stores cash securely at the point of use and keeps an accurate accounting of its inventory and transactions . Generally, you'll find these devices in banks, credit unions and back-office retail cash rooms.

In a cash recycler, banknotes are placed into a feeder then passed through a bill identifier to determine the denomination and validity of the

notes. The banknotes then enter a secure safe enclosure where they enter separate storage modules based on their denomination until they are dispensed in a future transaction.

So, it's the very definition of recycling, the cash that is deposited to a recycler is the same cash dispensed from it for later use.



What Can Cash Recyclers Do For My Institution?

And other important questions.



Is My Financial Institution a Candidate for Cash Recycling?

It depends.

Without question, there are no two organizations exactly alike; for that matter, there are no two branches exactly alike. Determining whether or not your organization will benefit from teller cash recycling is all about understanding your data and branch objectives.

When implemented appropriately, cash recycling improves operational efficiency and customer engagement while reducing labor and other costs associated with cash management. But to ensure successful implementation, it is imperative to review your organizational goals, branch characteristics and re-engineer your branch processes.

Identifying the exact solution takes significant analysis, but there are a few basic questions you can use as a litmus test to determine if cash recycling is right for you.

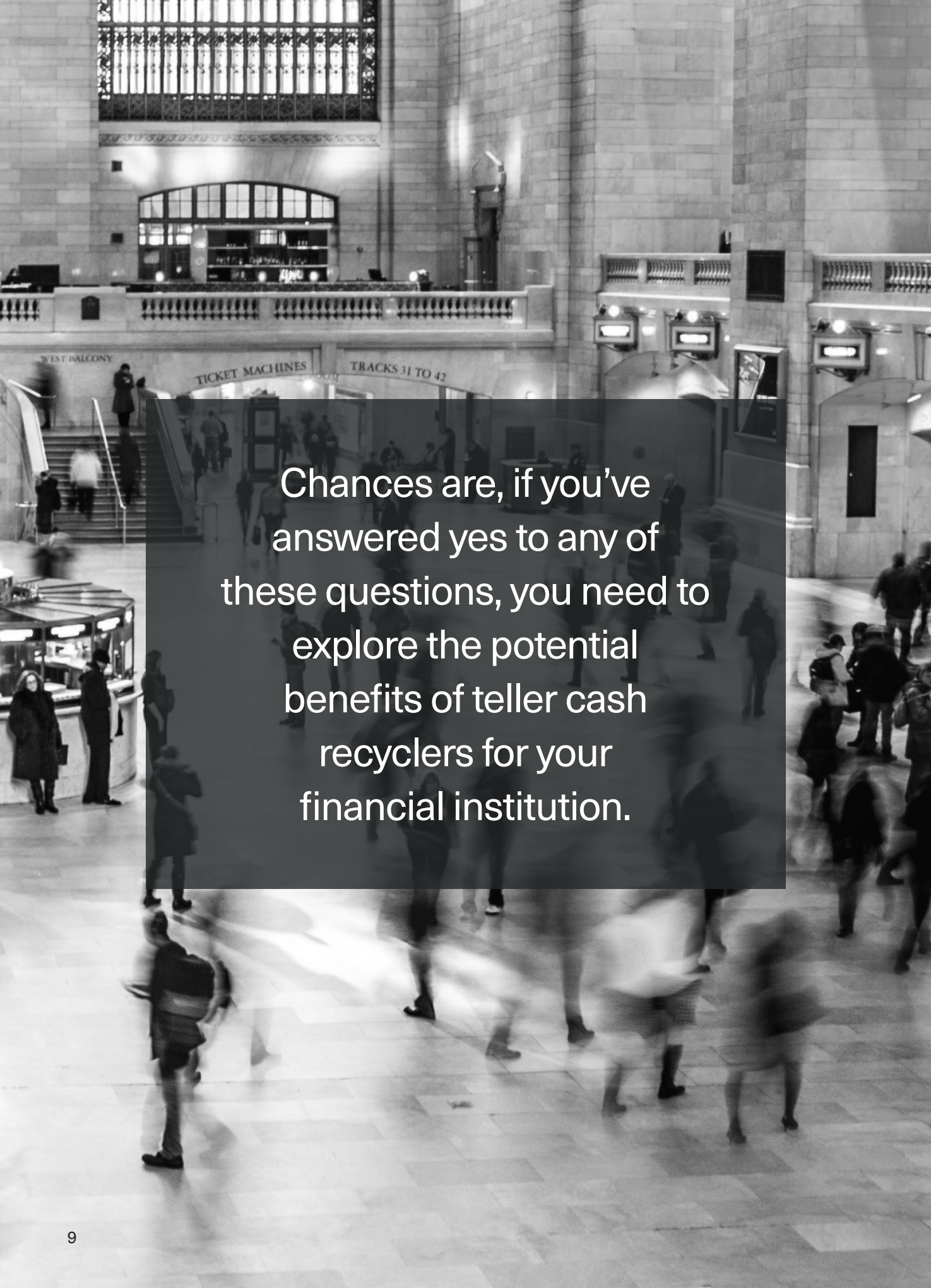
Are you currently working to lower the operating costs of your branches - specifically labor costs?

Have you or do you plan to implement the “universal banker” model - one where all branch employees can fill a variety of value-added roles?

Is branch remodeling or renovation currently being considered?

Are you looking to develop a sales-focused culture in your branches in an effort to grow your business?

Are you interested in installing new technology that tightens cash control and enhances the security of cash storage?

A black and white photograph of the interior of Grand Central Terminal. The image shows a large, open hall with a high ceiling and stone walls. In the background, there are arched windows and a balcony. A sign above an entrance reads "TICKET MACHINES" and "TRACKS 31 TO 42". To the left, a sign says "WEST BALCONY". The foreground is filled with many people walking, some of whom are blurred due to motion. A semi-transparent dark rectangle is overlaid in the center of the image, containing white text.

Chances are, if you've
answered yes to any of
these questions, you need to
explore the potential
benefits of teller cash
recyclers for your
financial institution.

How Will Cash Recyclers Impact Me?

From the corporate office to the teller line, the value you see from cash recycling often depends on your role in the organization.

CEO / President - You're charged with maximizing shareholder value, developing a strong and supportive employee culture and delivering best-in-class service to your customers. In as much as recyclers lower labor costs, improve teller efficiency and security, and focus staff on serving customers rather than managing transactions, they appeal broadly to chief executives.

COO - You are responsible for strategic planning and delivery of technology and operations across your bank network. You analyze systems and processes to develop an efficient operating model. While you appreciate the security and financial benefits of recyclers, for you, they represent flexibility to change the branch environment. By securing cash at the point of use, they allow you to

implement teller pod and other open concept designs as well as innovative operating models such as universal teller, concierge and mobile teller. Shifting focus from cash to the customer is essential in creating a warm branch environment.

CFO - Your job is to oversee the financial operation of the bank. Foundational benefits of cash recycling include centralized visibility of branch cash inventory and an overall reduction of cash on hand through more intelligent cash management. By reducing the amount of cash in branches, you're able to convert a nonperforming asset into an asset that yields a return.



Branch Manager - You wear many hats. You lead your team, serve as the first level of client escalation and advocate your brand in the community. Teller cash recyclers allow your team to focus more on problem solving and meeting the financial services needs of your customers rather than just counting cash and overseeing transactions. More productive, happier branch staff will deliver better service to your customers or members.

Head Teller – The head teller is the person responsible for making sure the teller line runs smoothly, accurately and in accordance with corporate policies and procedures all while delivering superior service to customers. For a head teller, cash recyclers mean the teller line handles fewer notes, balances

in a fraction of the time, and can turn attention to value-added customer experiences without putting accuracy or policy adherence at risk.

Teller – As the front line or face of the brand, tellers deal with customers who expect professionalism and consideration. You know what it means to work in a high stress environment where you must adhere to a broad set of policies and procedures while quickly and accurately handling tens of thousands if not hundreds of thousands of dollars. Teller cash recyclers automatically verify, count, sort, store and balance cash so you can focus more on delivering the personal service only you can provide.

How Do Cash Recyclers Impact Branch Revenues?

Can a cash recycler directly increase branch revenue? Is cash automation a revenue generator? In short, yes, but it really depends upon your infrastructure and staff training.

Get ready for an industry buzzword: cross selling. By eliminating the mind-numbing task of counting money, your tellers now have time for quality conversation with your customers. Time to build relationships, to find out what customers' needs are and focus on which products and services will help them meet those needs. Building revenue through cross selling is the low-hanging fruit of cash automation. Do it well and the results can be staggering.

But cross selling can present some challenges since staff isn't always ready for this change. Many times, tellers were hired for one skill – their ability to count cash accurately. These days, tellers must also be salespeople. You may discover

some tellers have natural sales ability but others may need more training to hone their skills. Training goes a long way, but in the future, human resources will need to reassess the skills and traits for teller positions. So while cash automation can free tellers' time, they need to be able to effectively use that time with the customer.



By eliminating the
mindnumbing task of
counting cash, your tellers
now have time for quality
conversation leading to
more cross-selling
opportunities.

How Do Cash Recyclers Optimize Staffing?

This is a polite way of asking, ‘Can I eliminate a teller position?’ The short answer is maybe.

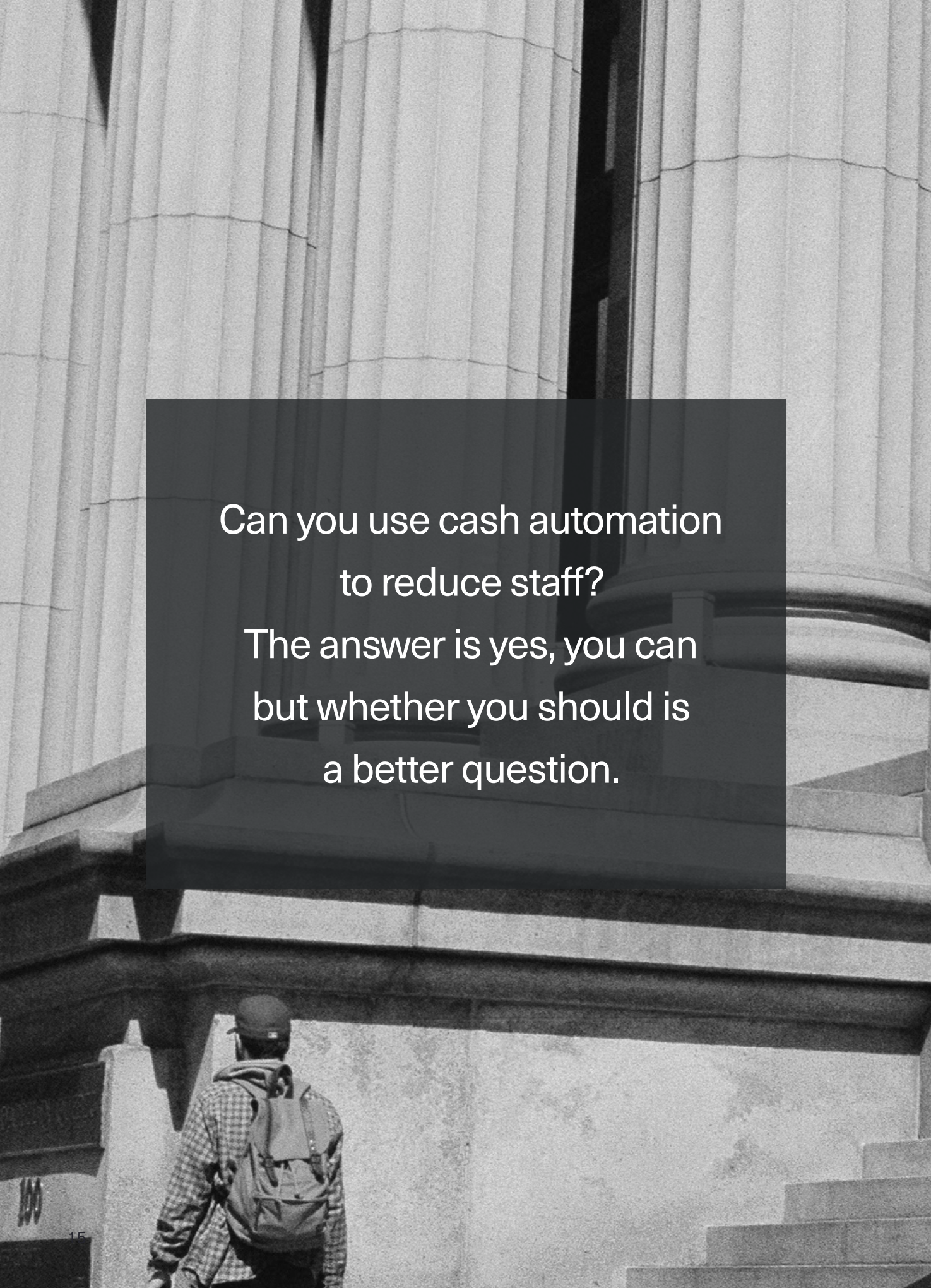
Research suggests that with a cash recycler, two employees can do the work of three. In traditional branch environments, constraints like peak-hours staffing needs and timeconsuming activities like vault buys, limit the ability to schedule teller shifts efficiently.

Automating cash processes is a good way to alleviate those constraints.

But, this brings up a more complex question. Can you use cash automation to reduce staff? The answer is yes, you can but whether you should is a better question. Repurposing —rather than eliminating — staff might be the answer. When you retain experienced employees, moving them into different roles, you can add value to other areas of the branch.

Perhaps a teller can be cross-trained as a loan officer to help alleviate logjams during peak hours. Maybe a vault teller is more available to jump on the teller line during peak hours or act as greeter when it's slower.

The possibilities are endless and the right answer probably depends on the needs and goals of each branch and its customer base.

A black and white photograph of a person with a backpack walking up a set of stairs in front of a building with large columns. The person is seen from behind, wearing a plaid shirt and a cap. The building features large, fluted columns and a series of steps leading up to it. A dark rectangular box is overlaid on the image, containing white text.

Can you use cash automation
to reduce staff?

The answer is yes, you can
but whether you should is
a better question.

How Do Cash Recyclers Enhance the Customer Experience?

So far, the focus has been how cash automation improves the staff experience but does it improve the customer experience?

Let's look at the difference. The teller is no longer intently concentrating on counting a pile of cash so there's opportunity for eye contact and conversation. Focus has shifted from the transaction to the customer. Tellers have the opportunity to get to know customers, show interest in their financial wellbeing and build long-term banking relationships. Consistent transaction convenience

and accuracy builds trust and customers find a resource for their financial questions and concerns.

Customers are sure to notice significantly shorter transaction times. By studying transaction lengths at thousands of branches around the country, research shows the following:

Average Consumer Transaction Time

Traditional Avg: **120 seconds**

Automated Avg: **30-35 seconds**

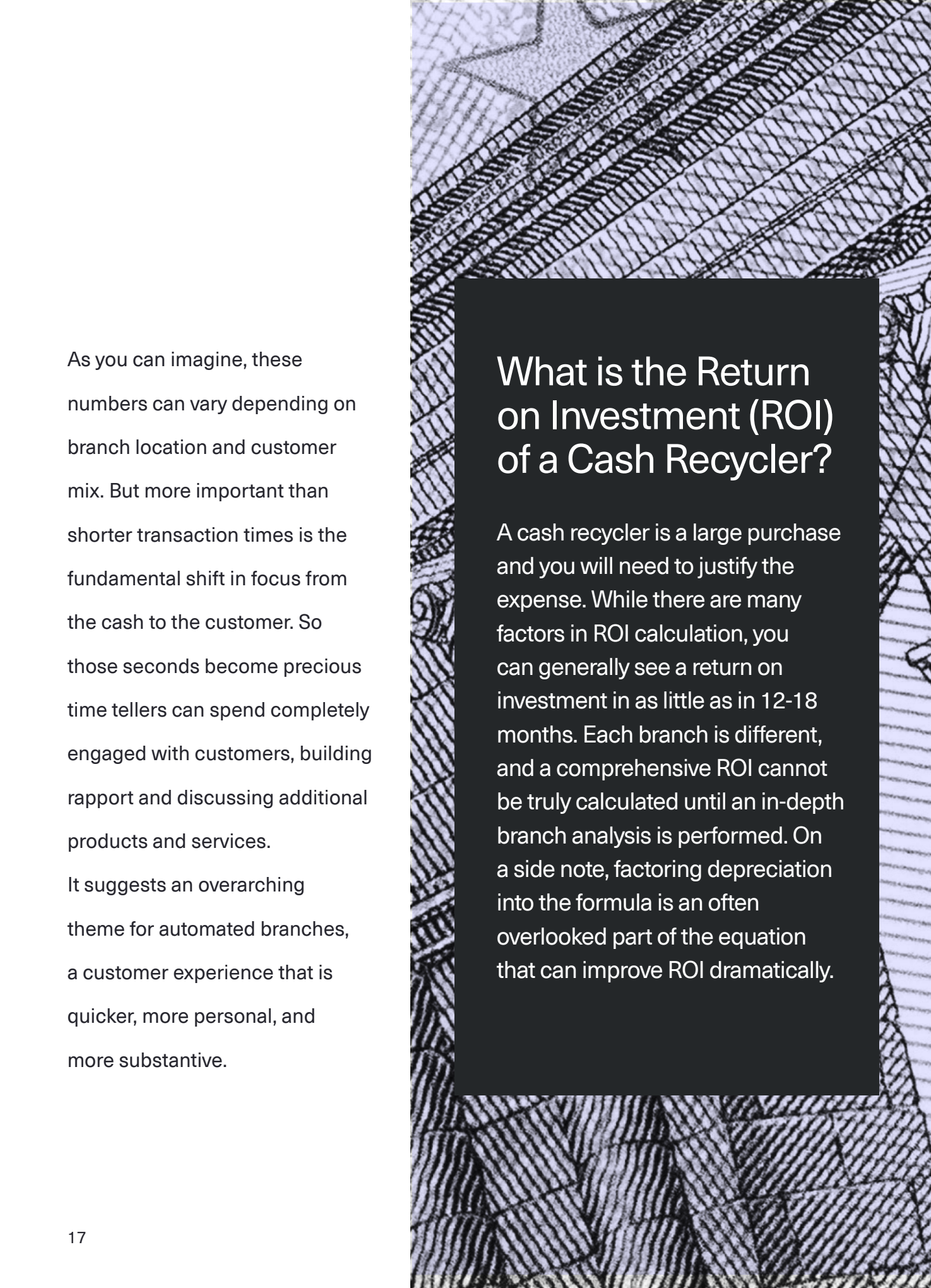
Average Commercial Transaction Time

Traditional Avg: **5-7 minutes**

Automated Avg: **1-2 minutes**



75%-80%
TIME SAVINGS

The background of the entire page is a close-up, high-contrast image of US dollar bills, showing the intricate patterns and textures of the currency. The bills are slightly out of focus, creating a sense of depth.

As you can imagine, these numbers can vary depending on branch location and customer mix. But more important than shorter transaction times is the fundamental shift in focus from the cash to the customer. So those seconds become precious time tellers can spend completely engaged with customers, building rapport and discussing additional products and services. It suggests an overarching theme for automated branches, a customer experience that is quicker, more personal, and more substantive.

What is the Return on Investment (ROI) of a Cash Recycler?

A cash recycler is a large purchase and you will need to justify the expense. While there are many factors in ROI calculation, you can generally see a return on investment in as little as in 12-18 months. Each branch is different, and a comprehensive ROI cannot be truly calculated until an in-depth branch analysis is performed. On a side note, factoring depreciation into the formula is an often overlooked part of the equation that can improve ROI dramatically.

Bank Design: Past and Future



Looking Into the Past and Future of Retail Bank Design

**Excerpt from an Interview
with DBSI Executive Chairman,
John Smith**

The bank branch is undergoing a metamorphosis. Mobile banking is well-established, in-branch transactions are declining yet banks still face pressure to develop additional revenue. Branches have been forced to adapt—and quickly.

For more than 20 years, DBSI has been instrumental in helping countless financial institutions modernize their branch networks. The Executive Chairman at DBSI, John W. Smith, has an interesting and thought-provoking perspective where retail banking has been and the direction it's headed.

What are three ways that banks can bring customers back into the branch?

One is “Let them know you exist.” There are more than a million retail stores in America and when we get visitors to our “ideation center,” I ask them all “What retailer or retailers stand out to you when you’re driving to work, when you’re on your way back home or driving around the city?” And there’s always a pause. There’s a scratching of the head. No one can name more than two. I mean, never. And it’s usually a variation of the two. So out of more than a million stores and most people can’t name two that truly have curb appeal or sell themselves 24/7. So you’ve got to be able to sell your curb appeal, your store, if you will, 24/7. I think, number two, is they need to be allowed to test drive. So if you think about Apple stores, everybody brings up Apple as that main retailer that gets it and who wouldn’t right? They’re immensely successful; their profit per square foot is higher than any retailer in America.

But if you go into an Apple store, what are all the consumers doing? They’re not picking up boxes and reading labels. They’re actually interacting with the products themselves. It’s the ultimate test drive. They’re seeing how it can fit their need and they’re seeing how easy it is. If they have a question, there’s someone right there on the spot to help them understand. It’s the test drive experience, which I think is pretty cool.

And then, number three is they should be given value. So the consumer need is evident. If you look at savings rates, they’re horrifically low. If you look at debt accumulation, it’s horrifically high. So there’s clearly a need for advice.

Banks can help their clients through their life journey more effectively. They simply need to connect the dots to the solutions and then execute to that because it’s really fuzzy right now. Let them know you exist, allow them to test drive, and truly give them value to their need.

You're on the cutting edge of retail banking design. What do you see?

I think branch transformation is at the top. So why is that?

Well, 65% of an FI's cost is tied up in their stores; I'm referring to the "store" as their branch and ATMs. So if you don't optimize this channel, that cost could truly be an albatross, meaning it could take you down. Look at retail as a whole—hotels, quick service restaurants, airlines, pharmaceutical, and of course, retail stores. Most have recognized the need for this change way before banking leading them to optimize and enhance their stores. And FI's are seeing that and want to apply these principles. So what does that even mean? Stores that advise, educate and help you on-board to a more convenient way to bank, create a differentiated experience. And do it all, of course, at lower cost. I think an extension of that, which is part of branch transformation, is the micro-branch and shared tenancy. Getting smaller—getting closer to the consumer. Pulling in traffic because traffic is already going to another retailer, but you're so close and so adjacent that it will drive traffic to you— all at typically 25% to 50% less cost.



You've spent a lot of time in the banking industry with a focus on technology. How has technology changed the way branches are designed?

I'll speak to that from a pretty robust background in this, both domestically and frankly, all over the world.

But historically, no matter if it's in the U.S. or globally, branches were designed first and foremost to protect the main asset, the cash. That led to a bunch of service barriers and bad

service and horrific ways branches were designed.

Along comes a cash recycler. Which to me, is one of the easiest decisions an FI can make. It protects the cash asset and brings vault-like security onto the branch floor.

It frees up the space to be more retail and open, more

service-oriented. And it allows the staff to focus the clients' needs versus mundane transactions. And ultimately, it removes the worry of out-of-balance conditions. So branch staff truly can free their minds for what's important to the bank or credit union which is service and needs-based selling.

Is there a place in retail banking for both assisted self-service machines and cash recyclers?

It can be a transition, or it can be both. A bank can choose one or both of those strategies. I think it's really flexible and really depends on the branch experience the FI wants to deliver.

At a minimum, the key is ensuring two things. One, it's more than just the right tech. I think most every time, people get this wrong by just thinking "I'll pop the tech in and magically, people will see that it's a better way to do banking" and it just doesn't happen that way. You have to have the right process, the right message of why the tech is important and how it is more valuable or beneficial to consumers and staff.

And two, what are the transitions? For customers, an example might be if they begin at a self-service station but need to move to a banker to open a money market account, how do you effectively transition them? i.e. How is their journey laid out? And for the institution transition may be, if they start with one device, how do they build the flexibility to easily move to the next gen of the technology at a really low cost?

So you start out with recyclers, they make all the sense in the world, right? It's really skilled, full-service banking. But if you want to lower your costs and migrate folks to self-service, but still have an assisted, human touch, it's making sure you get the process right and that the staff is trained effectively. So I think they can coexist.

DBSI helps banks and credit unions create highly efficient, profitable branches with a uniquely smarter experience. With over 3,000 projects completed per year, DBSI is devoted exclusively to helping the financial industry redefine banking. DBSI has won national acclaim from Forbes, Inc. 5000 fastestgrowing companies, Inc. Hire Power and was voted Most Innovative and Most Admired. Founded in 1998, DBSI is headquartered in Chandler, Arizona, and provides comprehensive branch transformation services such as design, technology, equipment, construction, digital signage and facilities maintenance services. For more information please visit www.dbsiinc.com

horrific ways branches were designed. Along comes a cash recycler. Which to me, is one of the easiest decisions someone can make now. It protects the cash asset and brings vaultlike security into the main branch. It frees up the space to be more retail and open, more service-oriented. And it allows the staff to focus the clients' needs versus mundane transactions. And ultimately, it removes the worry of out of bounds conditions. So the staff truly can free their mind to what's important to the bank or credit union which is service and needs based selling.





What to Think About When You're Thinking About Cash Recyclers



Do I Need to Change My Teller Line?

You've researched, talked to peers and heard enough success stories to be convinced in moving forward with cash recyclers in your branches. Now what ?

What type of modifications will be needed on the teller line to prepare for this new direction? Will the deployment of this technology accompany a branch redesign or renovation? Will the existing teller counter need to be raised or retrofitted to make room for this new device? What will all of this added construction add to the total project costs? These are all very common questions and concerns. And the answers will be based on the scale of your project and the cash recycler model you choose.

Many models are designed to fit snugly under the standard teller line with very limited modifications to existing infrastructure.

Some models are even the same size and footprint of a standard teller cash drawer allowing you to replace the under counter steel with a recycler in a retrofit application so you can be up and running quickly. Or you may be considering a branch redesign or planning a new branch. In this case, you may not be constrained by existing infrastructure but you must still consider your space requirements when researching individual machines.

Making the decision to explore cash automation in the branch often creates more questions than answers. But by digging into your internal processes, you can usually find inefficiencies worth addressing, and cash automation can be part of the solution.

A black and white photograph of two men in an office. The man in the foreground, on the left, is a Black man with a beard, wearing a striped shirt, looking down at a laptop. The man in the background, on the right, is a white man with glasses, also looking at the laptop. A dark grey rectangular box is overlaid on the image, containing white text. The background is bright and out of focus.

Some models are the same size
and footprint of a standard teller
cash drawer allowing you to
replace the under counter
steel with a recycler
as a retrofit application so
you can be up and running quickly.

Redesign or Retrofit?

One of the ways banks are better serving customers, is by building new branches or retrofitting current ones to be more accessible.

Open concept branches, sometimes called “pod” designs, deconstruct the teller line and locate bank staff at small workstations placed throughout the space.

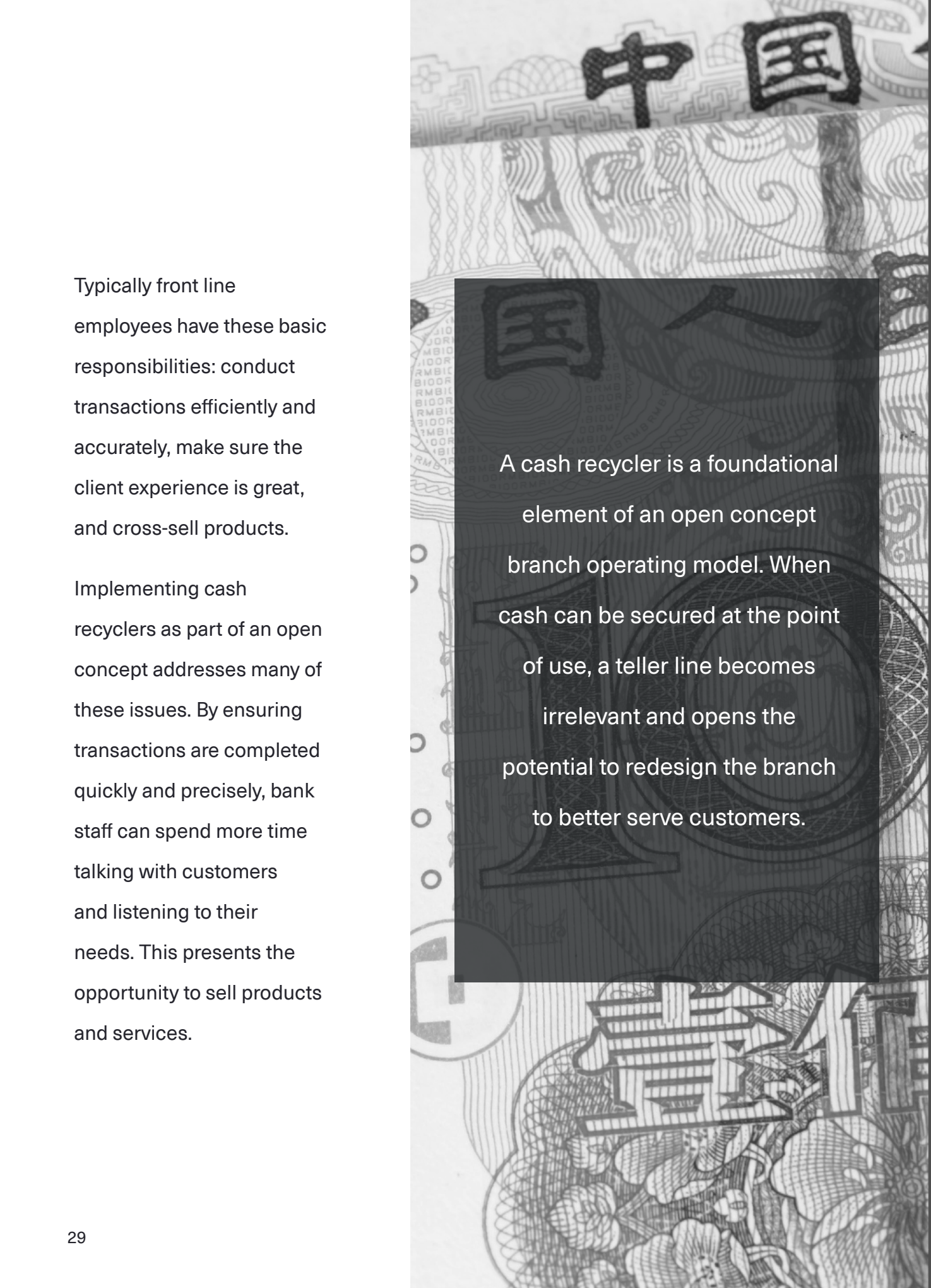
So instead of being served from a tall counter at a traditional teller line, customers interact with an associate at a standalone pod or seated desk. This eliminates several barriers to client service and facilitates conversations. These dialogues can lead to more sales and customers who feel more a part of the banking experience.

Cash recyclers in are key to making this design work. The recyclers secure currency at each of the stations, creating a safer environment for employees and customers. Having cash recyclers to

accurately execute transactions and secure cash in an open area is a critical component of successful open concept branch design. Without their security, speed, accuracy and the ability to keep a transaction record for individual operators, executing an open concept branch would be nearly impossible. An open branch environment helps staff engage more proactively with customers and creates a more retail-like experience. And cash recyclers are a foundational element of an open concept branch operating model. When cash is secured in a recycler, a teller line becomes irrelevant and opens the potential to redesign the branch to better serve customers.

Typically front line employees have these basic responsibilities: conduct transactions efficiently and accurately, make sure the client experience is great, and cross-sell products.

Implementing cash recyclers as part of an open concept addresses many of these issues. By ensuring transactions are completed quickly and precisely, bank staff can spend more time talking with customers and listening to their needs. This presents the opportunity to sell products and services.



A cash recycler is a foundational element of an open concept branch operating model. When cash can be secured at the point of use, a teller line becomes irrelevant and opens the potential to redesign the branch to better serve customers.

How Much Space Does It Require?

Where to place cash recyclers in your institution requires some planning.

Knowing the space requirements early in the process will help you select the optimal locations for your recyclers and allow you to plan for any alterations needed to accommodate them.

A recycler should be located where it is accessible to all potential operators. A typical placement is underneath a desk or counter with access for two operators. All operators should have access to cash input and output areas as well as display screens.

It's important to consider the recommended service clearance footprint for any recycler model. Service clearance requirements account for measurements such as the space needed for the safe door to swing completely open or how much unobstructed space is required where racks or drawers need to be fully extended. A technician should also be able to access any rear panels from

at least one side of the unit. You don't want to restrict service access and incur increased service time and costs.

Also important to consider is whether the floor at the installation site can support the weight of a device fully loaded with currency. Review technical specs for the maximum weight and surface load for a particular model so you can verify that your floor will support it. This is especially important if you are installing a recycler in an old or historic building or a floor above ground level.



Consider total space required to operate and service the device when making a decision

The Economics of Ergonomics

Ergonomics is an overlooked, but important part of the cash recycler buying decision.

On any given day, a teller will spend eight or more hours at a desk or window assisting customers. Whether it's the repetitive motion of counting cash or repeatedly stretching for a cash drawer that is a little out of reach, there are multiple ways a repetitive motion injury could occur.

To prevent repetitive motion injury, you should be able to execute repeated physical movements with efficiency and ease.

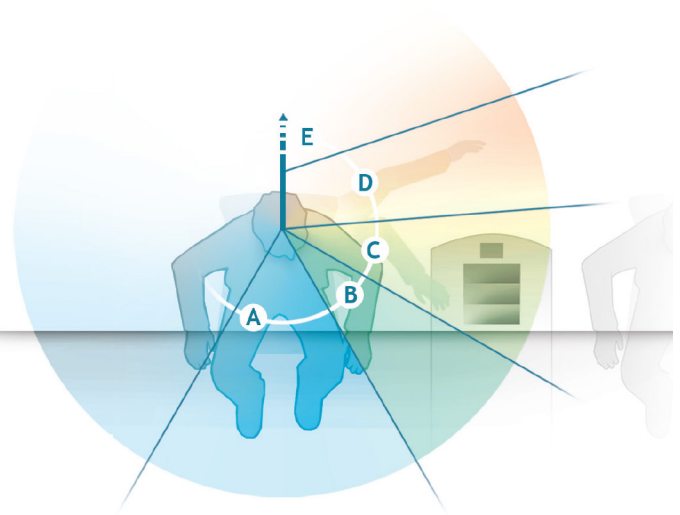
Repetitive Motion Disorders are caused by too many uninterrupted repetitions of an activity or motion or unnatural or awkward motions. A cash recycler solves many of these teller line overuse issues, but it's also important to ensure that the machine doesn't create complications. With a little foresight and planning, many overuse injuries can be prevented. Where will the machine be located? Is the feeder and output in an optimum spot? Will reaching for cash cause undue stress on the back?

According to Ergonomics Plus, there are five proven benefits of a strong ergonomics process at the workplace:

- 1. Reduce costs**
Approximately \$1 of every \$3 in workers compensation costs can be attributed to RMDs.
 - 2. Improve productivity**
The best ergonomic solutions will often help employees to be more productive. Ergonomics improves quality.
 - 3. Improve quality of life and performance.**
Employees can become frustrated or fatigued due to poor ergonomics which impacts the quality of their work.
 - 4. Improve employee engagement.** If an employee is free from discomfort during
 - 5. Create a better safety culture.** Making a commitment to employee health shows your employees that you care.
- their workday, there is less absenteeism and turnover, as well as an increase in employee involvement.

Consider the Five Operator-Machine Interaction Zones:

- A. Zone covered only by visual field.
- B. Visual field with neck rotation.
- C. Visual field with neck and shoulder rotation.
- D. Visual field with neck and whole body rotation.
- E. Visual field with neck and whole body rotation and whole body movement.



Coin or No Coin?

You understand the benefits of cash recyclers but what about coin dispensers? In the same way a cash recycler dispenses banknotes for a cash-out transaction, a coin dispenser dispenses loose coins for the same transaction. A coin dispenser alongside a cash recycler shortens transaction and wait times, allows more face time, and improves accuracy for coin-out transactions just like a recycler does for banknotes.



Hardware Features – What's Important?

Note Capacity – How Much is Enough?

When selecting a cash recycler, financial institutions and retailers alike must determine the right note capacity to fit their business needs

Inadequate capacity results in workarounds that erode efficiency gains at the heart of cash recycler ROI. Surplus capacity encourages staff to retain too much of a non-performing asset. So what is the right capacity? Again, it depends.

Understanding cash volumes at the local level as well as the manual processes surrounding cash in the branch is key to determining the note capacity you need. Sole control custody, segregated storage and dual control cash replenishment procedures are just a few of the manual processes that limit the ability to accurately manage inventory requirements. In an attempt to control shrink and limit theft, these manual processes sacrifice inventory control for accountability. Once the limitations imposed by manual cash handling processes are fully

understood, calculating the appropriate capacity for a cash recycler becomes far more academic.

The adage “you can never have too much of a good thing” fails to ring true in the case of cash on hand and cash recycler capacity. The goal of recycling isn’t to store as much cash as possible — it is to store only the cash you need and not a dollar more.

On average, financial institutions and retailers reduce average cash on hand by 25% - 40% after implementing recycler technology. By storing currency centrally in a cash recycler with detailed electronic journal capabilities, businesses eliminate redundancy in denominational inventory without compromising audit and security.

The goal of recycling isn’t to store as much cash as possible — it is to store only the cash you need and not a dollar more.



On average, FIs reduce
average cash on hand by

25% - 40%
after implementing cash recyclers.

Rolled Storage Modules vs. Stacked Cassettes

Understanding the difference in functionality and deciding which is best suited for your needs will help you narrow your options.

Cash recycler models are based on one of two designs: Roll module (RM)/ Rolled storage module (RSM) or traditional stacked cassettes.

- **Stacked cassette technology** was introduced in the 1970's with the first ATMs. The fundamental design of box-like cassettes that open from the top as well as the picking technology used to retrieve notes from each cassette has remained largely unchanged
- **RM/RSM technology** was introduced in the 1990s, specifically to address problems with cassette-based technology including the note-picking errors that triggered frequent audits.

Stacked Cassettes

Stacked cassettes store banknotes like a traditional ATM cassette. The difference is that the cash recycler is both stacking the notes as they are processed through the unit and storing them for later retrieval. The notes are stacked on top of each other from the bottom of the cassette to the top. When a withdrawal is in progress, notes are removed from the cassettes with friction-based picking, just like an ATM.

Stacked Cassettes

Key Advantages

- Typically faster deposit and withdrawal speeds
- Higher note capacity per cassette
- Sometimes the cassettes can interface with an ATM
- Fast manual cassette loading

Key Disadvantages

- Limited denomination configuration with most limited to six cassettes and severely limiting the options for configuring denominations.
- Multi-picking errors are a byproduct of friction picking technology. Longer total transaction time due to jams and errors.
- An internal reject bin that results in balancing issues and triggers more frequent audits.
- Security. If the safe is opened, notes can be rapidly emptied from the cassette for a higher level of vulnerability during a robbery event.
- Different sized notes require manual hardware adjustments to the cassette and take the unit out of service.
- Requires notes in pristine condition to function well.

Rolled Storage Modules

Cash recyclers based on roll module (RM) design, also known as rolled storage module (RSM), store notes on roll drum modules. One by one, notes roll onto the drum as they are deposited and roll off the drum as they're dispensed. While on the drum, they are held in place by thin strips of clear Mylar, keeping tension at all times and ensuring they are separated to prohibit more than one note from exiting the cassette at a time. Depending on the device model, notes are stored short-edge or long-edge first on a drum.

RSMs

Key Advantages



More cassettes. Two RSMs fit in the same physical space as one stacked cassette. RSM-based recyclers typically have 8 to 12 RSMs and achieve nearly the capacity of cassette-based models when designating multiple RSMs for a single denomination.

Flexible, tailored configuration. A higher number of storage modules allow the device to be tailored for the demands of each branch. So if 20s are the most popular banknote dispensed at your branch, you could assign three modules to that denomination.

More compact. The total size of all RSMs is smaller than the total size of six stacked cassettes resulting in a more compact device that can be used in a wide variety of applications.

Modular operation. Individual RSMs can be disabled without taking the entire device out of service. And if you have multiple cassettes of the same denomination, you're still in business with that denomination.

More secure. Notes cannot be added or easily removed manually. They must be processed through the device input and note reader to enter and exit the RSMs, creating an electronic transaction record and audit trail.

No internal reject bin. Reduces balancing errors and audit frequency and insures all notes are accounted for.

Higher note acceptance rates. Advanced reader technology tolerates a wide range of note fitness levels for fewer rejects.

Faster Total Transaction Speed
Lower reject rates along with faster device response to teller commands results in shorter overall transaction times.

Key Disadvantages



Individual cassette capacity is lower

If notes are stored on a cassette for too long there is the possibility of "cupping". (More common with cassettes that store notes short-edge first, rather than long-edge.)

More moving parts.

Deposit and withdrawal speeds are normally slower than cassette-based models.

Transaction Speed – Is Faster Really Better?

A cash recycler's speed of acceptance is important, but so is accuracy, length of bill path, simplicity and escrow design.

The banknote's journey includes a pass through a reader module (to check for note authenticity), numerous changes of direction and a brief stop at escrow, before finally being deposited. The device must be able to move a note through the bill path to the denomination cassette without causing a jam or miscount. Frequent jams and miscounts reduce overall transaction speed.

Reader modules vary wildly on the number of unique banknote characteristics they measure, which directly impacts speed and accuracy rates.

Long bill paths take more time and increase stoppage and error rates. Ideally, the bill path will be short with the note making a limited number of directional changes. And while there are some positives to physical escrow, it brings unneeded complexity to the bill path and it doubles the risk of errors

because the entire process is repeated before the note is finally deposited.

Outbound speed is important when moving cash from the unit to the vault. In the United States, cash must be strapped, so a flow that supports strapping in 100-note increments is ideal. Notes piling up beyond 100 will overwhelm the teller, requiring a recount and adding to the delay. It seems counterintuitive, but speed in this environment can slow down processes. The ideal outbound speed delivers 100 notes and stops. The teller can grab and strap and by the time he is finished, another stack of notes is delivered and ready for strapping.

The right speed, accuracy, low rejection rates, simplified virtual escrow and short bill path are all factors to be considered when determining to best cash recycler for your environment.

Banknote Recognition – How Does it Work?

Identifying suspect notes has become increasingly difficult and manual detection processes aren't thorough enough for financial institutions.

Even diligent tellers may not be able to see or feel the difference in a suspect bill anymore. Extra equipment like desktop bill authenticators and pens add time to a transaction and may not detect well-made fakes. Most desktop currency detectors and pens only detect one feature of a bill. Recyclers use multiple technologies to detect different security features that are manufactured into legitimate currency including:

- UV sensors to detect features such as embedded UV stripes
- IR (infrared) sensors to verify paper density and infrared ink features
- Magnetic sensors that verify authenticity of magnetic ink

Recyclers automate this tedious task and make it easier to identify counterfeit bills so they can be removed from circulation. This capability may not be the most critical feature but it's one of the things that recyclers can do to speed transactions and reduce risk.

UL vs CEN – What's the Difference?

Well, that depends on where you are in the world.

UL and CEN are organizations that design and maintain standards for the physical and environmental safety of all types of products.

Underwriters Laboratories (UL) is an independent safety consulting and certification company in the United States and the European Committee for Standardization (CEN) provides a standards platform for the National Standardization bodies of 33 European countries. The public (and insurance underwriters, of course) rely on these ratings to ensure products operate as implied.

Recyclers are classified as burglary protection products and are categorized with locks and safes. So, when a recycler is certified by UL or CEN, it has been rigorously tested against a standard and has met theft-resistance, fire-resistance and environmental operating requirements.

UL291 is standard for equipment like ATMs and recyclers. It requires devices to meet a certain level of protection against currency theft and alteration of its transaction records. Ratings within the UL291 standard further classify safes as Business Hours or 24-hour (Level 1).

As the names imply, safes rated for business hours are designed to operate with supervision. But a Level 1 rating means the safe offers protection without direct supervision. Level 1 safes have thicker metal and can withstand physical attacks for a longer period of time.

The CEN standard covers everything that UL covers; fire ratings and break-in theft resistance. To test break-in resistance, CEN uses a formula using partial/complete access, tool type, times, tool coefficients and tool values to calculate a resistance value, expressed as a grade from 0-VII.

Alarms

What's Guarding Your Safe?

Without alarms even the strongest safes are vulnerable to attack. Below are four of the most common alarms found in today's cash recyclers:



Thermal Alarm

If the internal safe temperature exceeds a certain level an alarm is triggered. Defends against attacks from blowtorch, heat cutting device, etc.



Door Contact Alarm

The alarm is activated if the door is opened without authorization. Protects against internal and external threat.



Seismic Alarm

An alarm sounds if a mechanical vibration is detected. Example: rope and tow, hammer drill, sledgehammer, etc.



Duress Alarm

A pre-programmed "alarm code" allows the operator to manually trigger a silent alarm if faced with a threat. Gives tellers a safe and discrete way to respond to a robbery.

Locks – Another Layer of Security

The safe portion of a cash recycler must meet certain security requirements to comply with regulations for banks and other financial institutions. One of those requirements is that the safe is secured with a lock. Ideally, the lock should also carry the same security agency certifications (UL or CEN for instance) as the safe.

There are a variety of lock models and features to consider with varying levels of sophistication and price. Some combine the use of lock hardware and systems software to program, manage and even audit the lock. But what do these lock features mean? It helps to understand the features so you can determine which features are important for your environment and processes.

Here's a glossary of terms you'll encounter when selecting a safe lock.

Single user access - only one user code is required to open the lock. Multiple user access – allows multiple users to be added to the lock, each with a unique code.

Manager or supervisor mode – a single manager code for a designated Manager user to change lock settings, manage other users and audit the lock.

Dual mode or dual code – requires two different codes (users) to open the safe and the two combinations must be correctly and consecutively entered to open the lock.

User override – allows the manager to override any user's access.

One-time code – allows a unique, one-time code to be issued to users like service technicians and CIT personnel.

Wrong combination penalty – more than a few consecutive invalid combinations disables the lock for a specific period of time.

Time delay – allows the lock to be programmed to delay opening for certain period of time after a valid combination is entered. This period is followed by a programmed open window.

Open window - defines the amount of time in which a valid code can be entered to open the safe following a time delay.

Audit trail – record of all lock activity (usually limited to a specific number of events). The audit record cannot be deleted.

Silent alarm – usually operates by sending a silent signal to an alarm system and is triggered by entering a specific code designated for the alarm.

Lock disable – allows a code to be entered which disables the lock completely until it is enabled again.

Onboard Operator Display – Yes or No?

One last feature to consider is an onboard operator display.

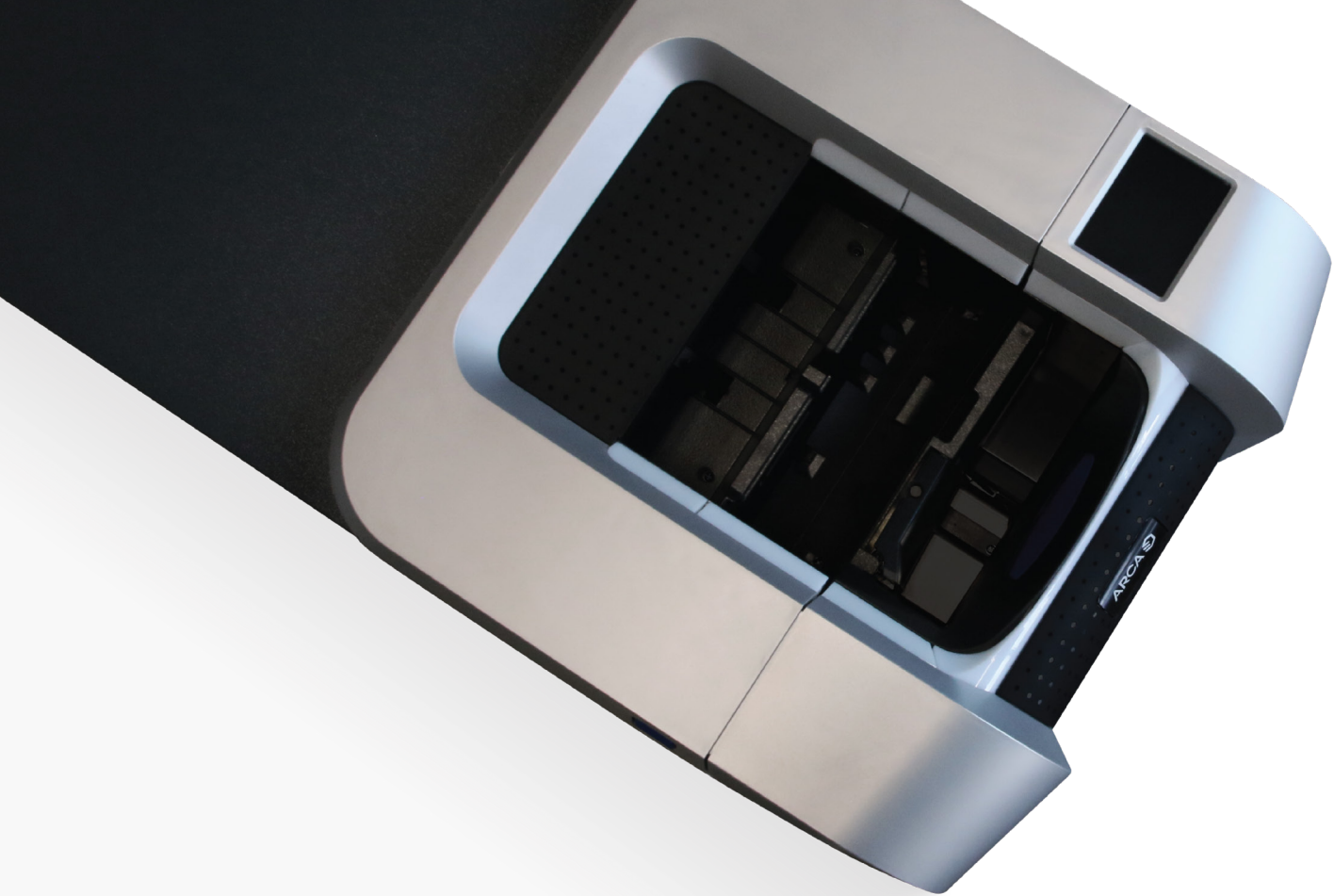
Cash transactions are typically managed with a software application on a computer connected to the recycler. But onboard software can extend a recycler's functionality.

Most recycler models have touch screens with user-friendly, graphical menus that allow operators to perform offline cash operations, change device settings, view cash inventory and even monitor the health of the unit itself. Depending on the model, you may even be able to analyze event logs, upgrade the firmware for new currency codes or temporarily disable individual cassettes without taking the whole recycler out of operation.

A downside may be potential security issues if screens are visible to customers and large enough for cash inventory or other sensitive data to be viewed.

A significant benefit of an onboard display is diagnostic functionality. Often the screen can show the exact location of a jam or error with instructions or a video to resolve it. If an operator is able to quickly identify and troubleshoot an error, potential downtime is reduced. Even when it's necessary to call for technical assistance, the display can provide additional details about the issue to help the operator communicate more accurately with technical support.

An onboard display comes down to a matter of preference and it may not be a necessary feature in your environment. The enhanced functionality of onboard control makes the recycler a more powerful tool, so it's a feature worth considering.





Software Integration – What are the options?



How Does It Integrate With Your Existing Systems?

Installing cash recyclers in your branch isn't just about deciding which model meets your physical and functional needs. It's also about determining how to integrate cash recyclers into your branch operations. To decide how to assimilate this new technology efficiently, requires a coordinated effort between multiple departments.

There are essentially three choices to consider:

- Directly integrating recyclers with your current core software platform
- Operating cash recyclers in a standalone environment
- Operating cash recyclers using application middleware

Educating yourself on the available integration strategies and carefully comparing and contrasting your options will help you make the right choice. integration strategies and carefully comparing and contrasting your options will help you make the right choice.



There are essentially three
integration methods:

Direct
Standalone
Middleware

Direct Integration

Direct integration is frequently touted as the best option for deploying cash recyclers in retail branch environments.

The interface between the hardware and software is hard coded so it's the most seamless method from a staff perspective. When teller performs a cash transaction, the teller application communicates directly with the recycler. Tellers operate in their familiar software environment so they can focus on learning the hardware.

Direct integration, in its purest form, means a core teller platform provider, working with the recycler manufacturer, builds machine code into the core platform so it communicates directly with the recycler. This type of direct integration is often very costly, proprietary

to a manufacturer or application platform, and can limit recycler operations to functionality allowed by the teller application.

Direct integration has expanded to include use of universal or multivendor APIs. An API, in this context, is a packaged set of software protocols that supports the native communication language of all major hardware vendors. Teller platform providers can integrate this package into their existing software, reducing time and resources required to start from scratch. Most APIs used for cash recyclers are built by third parties and considered "universal", meaning they are not hardware specific. Once the API has been implemented, a core teller platform can be considered to have a "direct integration" available.

PROS

- Eliminates double keying with no intermediate application between teller and device
- Supported by core system and device supported/certified by the teller application provider
- Often lower costs in licenses and fees for enterprise rollouts
- Minimal disruption to current teller workflow

CONS

- A universal API can limit recycler performance and capabilities
- Code development is expensive and subject to long lead times
- Costly for core system – application provider has limited incentive to "certify" devices
- Support can be confusing relative to root cause – hardware or software issue?



For large enterprises,
direct integration is an
extremely stable and
scalable solution since the
code is written once and
distributed throughout the
branch network.

Standalone Application

Standalone implementations leverage a locally installed software application to operate the recycler independent of the teller application.

Tellers toggle between the two applications on their desktop (often employing shortcut keys). This requires them to key transaction amounts in both the standalone application and the teller application (double keying). The challenges of implementing a large number of standalone devices make scalability difficult.

PROS

- No costly development work or application customization
- Highly stable with applications designed specifically to support recycler functionality
- Application agnostic solution -- not tied to specific teller application
- Simple to train, use and manage exception conditions

CONS

- Double keying creates opportunity for error
- Can be cost-prohibitive for enterprise rollouts
- Generates need to support yet another application in branches

A black and white photograph of two men in business attire. The man in the foreground is wearing a dark suit and a striped shirt, looking down at a laptop. The man in the background is wearing a dark suit, a white shirt, a dark tie, and glasses, also looking down at the laptop. A semi-transparent dark rectangle is overlaid on the image, containing white text.

Depending on your goals
for teller cash recycler
adoption and the
characteristics of your
branch, standalone
application deployment
may be a valid option.

Middleware Application

Middleware (or Soft) integration attempts to address the functionality issues of standalone applications while utilizing recycler features that are often lost in direct integrations.

Much like standalone environments, middleware resides on local PCs, but it is mapped to both recycler and teller software, acting as a translator between the recycler and the teller application. This eliminates double keying but does add an extra step to balancing.

PROS

- Lower cost due to limited or no need for custom application development
- Eliminates need to double key amounts outside of balancing
- Application agnostic so it protects investment
- Simple to train, use and manage exception conditions

CONS

- Adds a step in balancing allowing opportunity for error
- Enterprise rollout can be cost prohibitive
- Changes to the teller application may threaten stability of “mapping”
- Generates need to support yet another application in branches

Middleware can be an attractive alternative to lower-functionality standalone or more costly direct integration options. Traditionally, middleware providers have been more reactive to new feature requests and customer needs. Middleware tends to be more hardware vendor specific, with a unique offering depending on the hardware manufacturer selected.

How Does Soft Integration Work?

Soft integration uses software to capture cash transaction data from a teller application. The software tool defines the screens and fields in a teller application that contain the cash in and cash out values for deposit and dispense transactions. The current crop of software tools use a variety of sophisticated OCR and non-OCR technologies to capture the transaction data. The middleware is then set up to recognize the values in the defined fields and screens to retrieve and send in its commands to the recycler. Once it's configured, the middleware can operate in the background, translating data between the teller application and the recycler.

Data Capture Technology

Middleware application providers employ various technologies to capture transaction data from teller software.

Optical Character Recognition (OCR) is one such technology. But many people still think OCR means screen scraping. The negative perception attached to the term is something the middleware community is still trying to change

Early middleware providers struggled with immature technology. But modern OCR technologies are far more advanced and bear little resemblance to earlier versions.

Many middleware providers also use other types of data capture. These technologies analyze the data flow between the systems and extract information needed to complete transactions. Proprietary data capture technologies in use are further advancing the field.

But, the perception has been hard to shake. Middleware providers still have to deal with the perception that screen scraping is old technology or simply does not work well. Capturing the data required for completing middleware transactions has come a long way and the negative stereotypes just don't apply to the modern middleware solutions.

There is no right or wrong answer, there's only what's right for you.

By weighing the ease of use, cost, functionality and scalability of each of these options, you'll choose the right integration method for your unique environment.



How Do Branch Processes Change?

How Do Branch Processes Change?

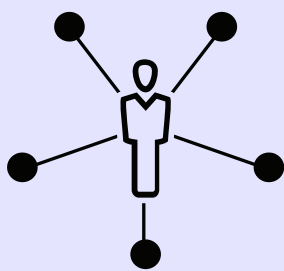
Recyclers improve the efficiency of nearly every cash process in the branch.

But what do more efficient processes really translate to? Time. More time to spend on high-value activities like customer engagement, building trust and cross-selling. And less time on the tedious, low-value work of cash handling and custodial dual control activities.

How much time, exactly? More than 10 hours to be exact. That's the how many hours of labor per day can be saved in an average branch by automating cash handling processes with teller cash recyclers.

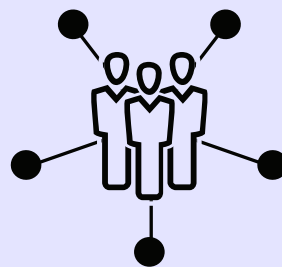
Just how valuable is better customer engagement? It's conservative to assume, after automation, a teller will be able to refer at least one additional customer per day.

And it's a safe bet that referral rates will continue to increase as tellers become better sellers.



$$\begin{array}{r} 1 \text{ teller} = 5 \text{ referrals} \\ \times \\ 52 \text{ weeks} \\ \hline 260 \text{ additional} \\ \text{referrals/year} \end{array}$$

$$\begin{array}{r} 3 \text{ tellers} = 15 \text{ referrals} \\ \times \\ 52 \text{ weeks} \\ \hline 780 \text{ additional} \\ \text{referrals/year} \end{array}$$



Typical branch with 3 tellers and 1 head/vault teller with an average of 80 transactions per teller per day	Manual branch		Recycler automated branch		Minutes of labor saved per day
Cash Handling Procedures (average minutes per day over a week)	3 Tellers	1 Head Teller/ Supervisor	3 Tellers	1 Head Teller/ Supervisor	Combined Totals
Start of Day	30	--	15	--	15
Night drop bags*	55	55*	11	11*	88
Consumer cash transactions	50	--	25	--	25
Commercial cash transactions	518	--	259	--	259
Trial drawer balance	30	--	3	--	27
Final drawer balance	30	--	15	--	15
Vault buys and sells*	100	100*	31	31*	138
End of day	30	10	10	5	25
Armored delivery and verification	--	15	--	5	10
Cash order preparation	--	30	--	10	20
Teller audits and reporting	--	30	--	5	25
Totals	843	240	369	67	647

*dual control activity

How are processes different in an automated branch?

Easier Starting Procedures

When recyclers replace cash drawers, tellers have a secure vault, right at the teller desk. Rather than arriving half an hour early to set up cash drawers, start of day procedures are as easy as arriving, starting up the teller software PC, turning on the recycler and serving the first customers. That saves valuable staffing time and may even eliminate the need to have a head teller on site to open the branch.

Faster processing for commercial and night drop deposits

Whether the large deposits from retailers and other commercial customers are in the night drop box or happen over the counter during business hours, they slow down the teller line and create longer waits, often at peak times. In a manual branch, a teller must sort, count and verify these large deposits. But a recycler significantly increases the efficiency and accuracy of these large transactions by automatically sorting, counting, verifying and depositing the bills in a fraction of the time.

Fewer time-consuming vault buys and sells

Vault buys and sells are mundane, low-value transactions that require the largest percentage of time and resources. Recyclers reduce time-consuming vault buys by as much as 80% with cumulative effects.

When recyclers replace cash drawers, tellers don't manage drawer limits. That means they don't need to close the line 5 or more times a day when they reach the drawer limit to prepare cash for a vault sell, a process that can take 15 minutes or more. A vault sell also requires pulling a head teller or manager out of rotation to perform the sell under dual control. Recyclers also allow tellers to have greater cash inventory securely stored at the workstation resulting in fewer vault buys, another dual control, timeconsuming transaction.

When a recycler is used as a shared vault workstation there are still efficiency gains. Tellers may still manage drawer limits and frequent vault buys and sells but there's a huge difference. Because the recycler is a secured safe with a electronic transaction journal, the device can act as the second control. This means a individual teller can perform vault buys and sells while meeting security requirements.

Head tellers and managers who aren't constantly performing dual control transactions are available to assist customers and support branch staff.

Teller focus shifts from the transaction to the customer

The typical cash-handling portion of a transaction takes 20 to 45 seconds. In a manual branch, a deposit looks something like this:

The teller receives the cash from the customer then head down for the next 15-40 seconds, proceeds to count, sort and verify the cash, then enter the transaction into the teller software, place it in the drawer and finally resume eye contact with the customer once the transaction is complete. In the last few seconds, the teller may awkwardly try to cross sell another product but the customer is likely ready to move on.

In a cash automated branch, a deposit will look something like this:

The teller receives the cash from the customer, drops it in the recycler and the next 10-45 seconds are spent engaging the customer, looking at their account, talking about other products and building rapport. Meanwhile, the recycler validates, counts, sorts and processes the deposit. The teller confirms the deposit amount with the customer and the transaction is complete. The customer expresses interest in another type of account the teller just mentioned and the teller either refers the customer to a customer service rep or assists the customer with the new account.

Dispenses see the same transformation, less focus on the transaction allows more focus on the customer. Tellers in automated branches confidently engage customers in new ways without

worrying about the accuracy of their transactions.

Faster Teller balancing and end of day procedures

Recyclers virtually eliminate the balancing issues of cash drawers by removing human error and processing transactions accurately throughout the day. Tellers are able to help customers up to the last minute, quickly balance their machine, sign off and leave within minutes of closing time. Vault drawer sells are eliminated because the cash is securely stored in the recycler and ready for the next day. Vault managers only need to verify recyclers are balanced. Imbalances and cash lost to miscounts and error are no longer a problem and internal theft is reduced because all the cash is tracked at the time of transaction.

More effective cross-selling

In a manual environment, tellers live under the constant fear of being out of balance. This pressure drives some unintended consequences. Tellers constantly “fiddle” with their cash drawers during the day, moving money back and forth from their top drawer to the second drawer, performing trial balance counts, strapping and counting money, just to maintain control of their cash drawer.

Because they must perform every transaction perfectly and quickly tellers may resist additional pressure to cross sell, citing that they can't take their focus off of counting cash. Consequently, cross selling initiatives have failed partly because tellers wait until they finish counting the cash before they switch their focus to the customer.

However, while the customer is waiting for a transaction to process, the teller has their complete attention. Being able to engage with customers during each transaction leads to higher referral rates and higher cross-selling revenue.

Fewer vault and teller audits

Audits are still necessary for regulatory compliance but are less frequent and less painful with recyclers. Recyclers meet more stringent standards like reduced cash exposure so audits aren't required as often. Recyclers assist audits by keeping a complete audit trail for every transaction and staff member who touches cash.

Better cash inventory management

Managing the vault is more than just vault buys and sells. It's also balancing the vault and managing the total cash inventory in the branch. Recyclers capture important data about cash usage. Using this data, institutions can more accurately estimate cash volumes and denomination needs. This reduces costs related to maintaining cash inventory like cross shipments and cash ordering fees. Branches can reduce cash inventory expenses by 15%-40%.

Recyclers even improve the efficiency of cash deliveries. A recycler can count cash deliveries from cash-intransit companies and process that inventory directly into the recyclers. By eliminating the need for two people to count and recount cash whenever it changes hands, branches become more efficient in their staffing models and can more easily comply with

security policies that control the way exposed cash is handled and moved.

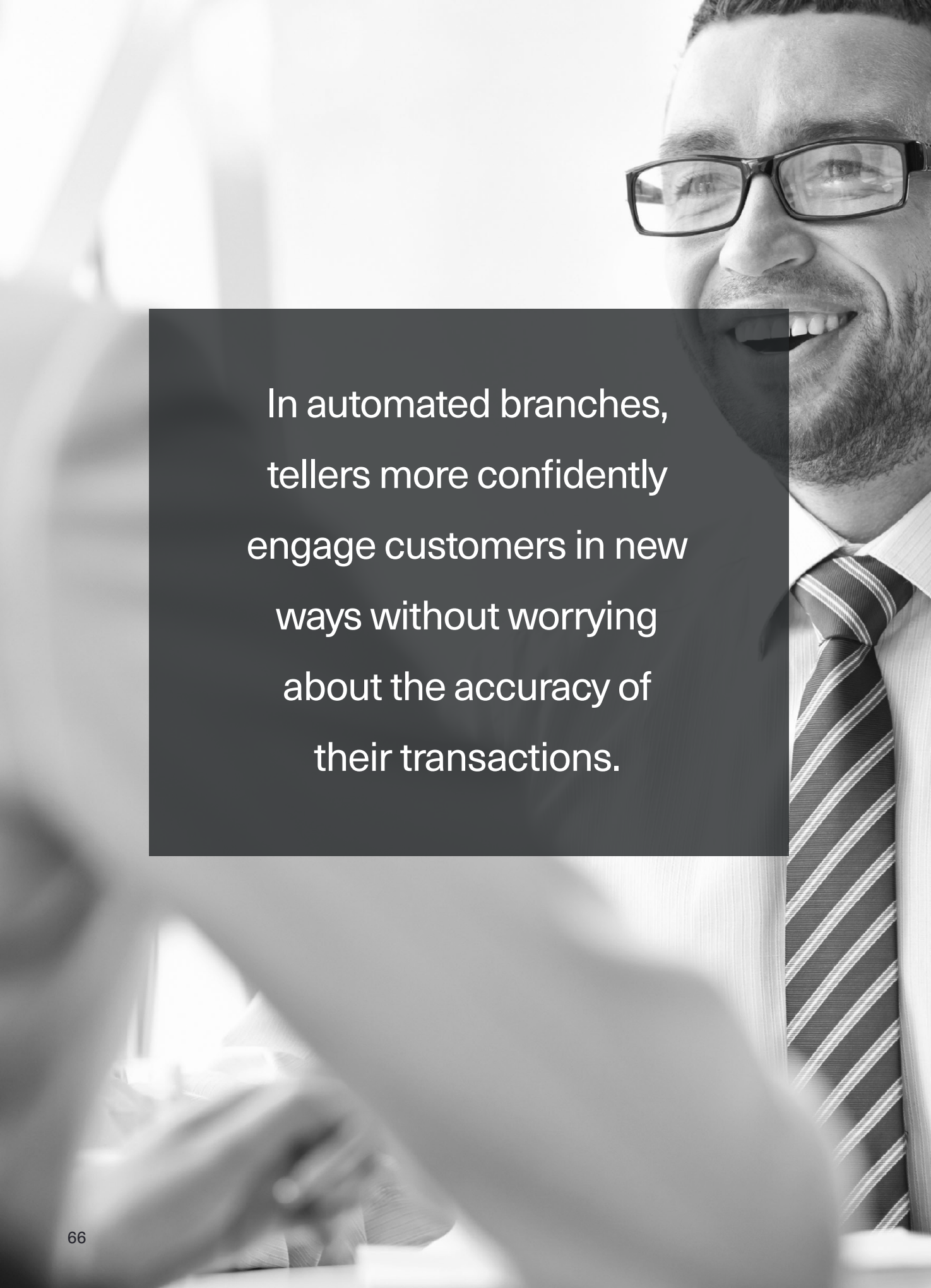
Improved customer service

To win and retain customers, banks must build a very high level of trust strive to be an important financial resource for their customers. To build that trust, banks must engage customers while providing convenience and accuracy. Customers aren't visiting branches as often, so when they do, it's important to engage them in a meaningful way. But speed and accuracy also have a direct effect on customer satisfaction. When a recycler automates the cash portion of a transaction, customers will notice tellers are focused on how to help them rather than how to process the transaction.

More efficient staff scheduling

When internal processes are streamlined, managers can schedule only the staff they need to serve customers not the staff needed for customers AND internal processes. With fewer dual custody transactions, head tellers are available to jump in during peak periods and support tellers on the line. Recyclers usually mean you can operate effectively with fewer tellers. Or you can crosstrain and develop your staff to be able perform different processes throughout the branch.

By automating the deposit, validation, denominational sorting, storage and dispensing of cash with a cash recycler, significant savings in both time and money can be realized.

A black and white photograph of a man with glasses and a beard, smiling. He is wearing a light-colored shirt and a dark, diagonally striped tie. A large, dark rectangular text box is overlaid on the left side of the image, partially obscuring the man's face and the background. The background is blurred, showing what appears to be an office or bank setting with other people's hands and arms visible in the foreground.

In automated branches,
tellers more confidently
engage customers in new
ways without worrying
about the accuracy of
their transactions.

Consumer Cash Deposit Analysis

Manual vs Automated

We examined the cash in processes for personal (consumer) and commercial accounts at hundreds of banks in North America. We used stopwatches to time transactions, took detailed notes on the steps, and thoroughly interviewed bank tellers on their internal bank processes. The results for the consumer account deposit processes are summarized on the following pages.

Consumer Transaction

Manual to Drawer

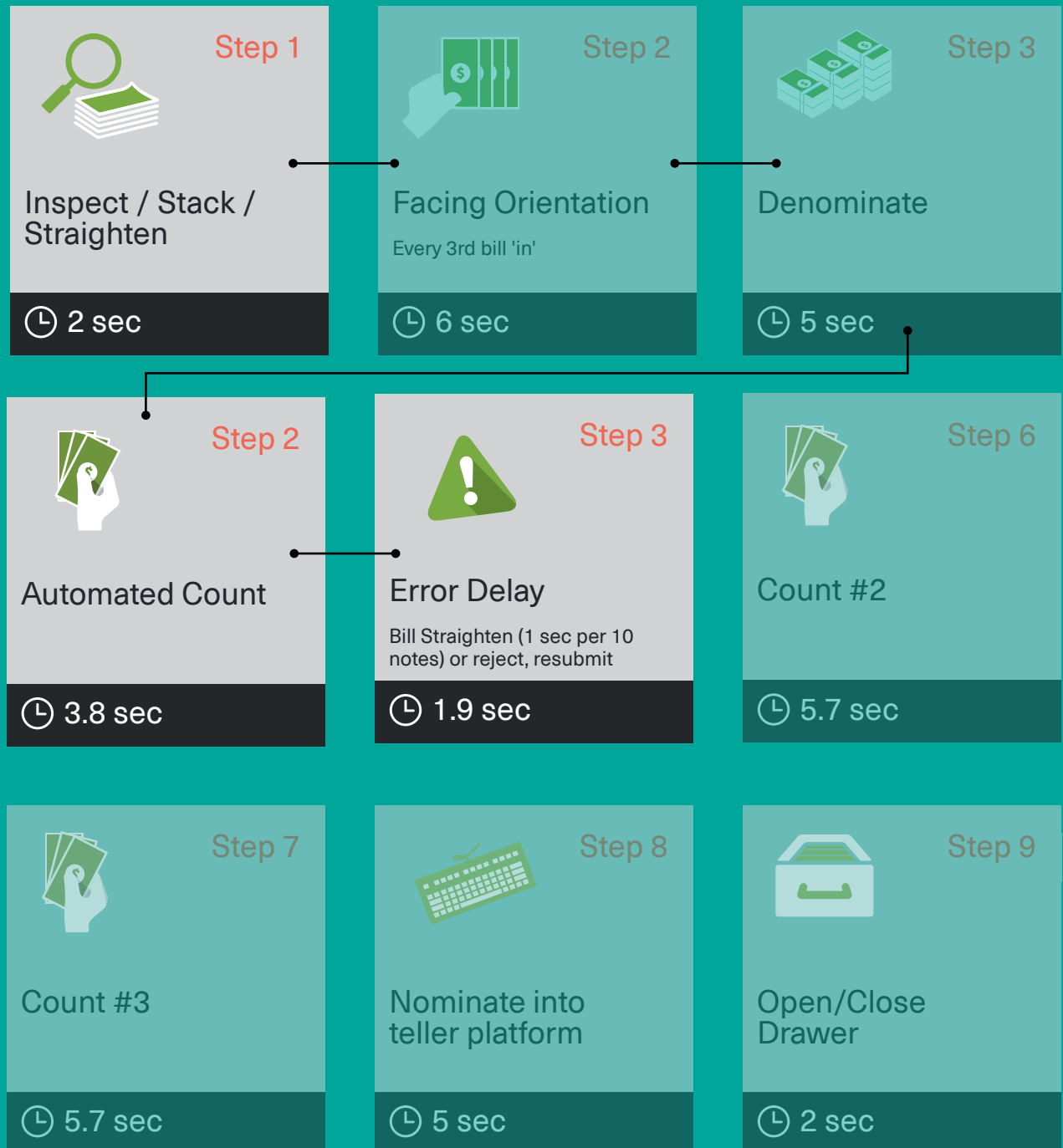
Notes: 19 | Count Rate per Note: 0.3 sec



Consumer Transaction

Automated to Safe

Notes: 150 | Count Rate per Note: 0.2 sec



Difference

9 Steps 0:39.0

Time Savings with Automation

00.31.3

3 Steps 0:07.7



What Does a Successful Cash Recycler Installation Look Like?



Three Characteristics of a Successful Installation

The vendor and the customer agree on a plan

The key to a successful implementation is the prep work.... detailed planning. Your Installations team should review all of the details with you in advance. They should ask you things like, "What's the closest entrance to here the recycler will be placed? Where is the best place to park? Where will the machines be placed? What type of flooring do you have? Will your counters or workstations require any physical alterations? Will your teller application company be on site during the installation?" With these details, the actual installation should go quite well.

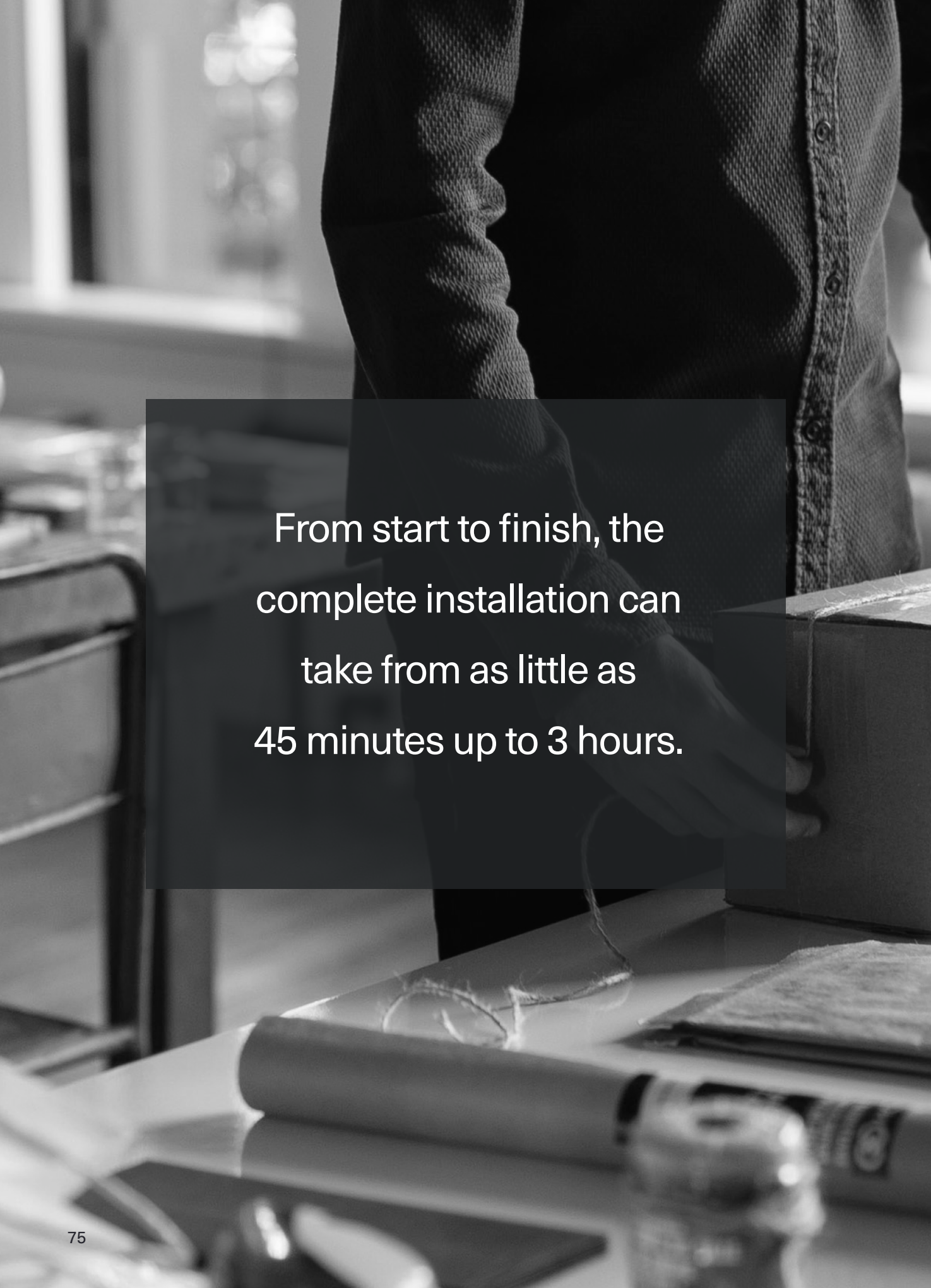
The install is scheduled during a slow period

You'll want to choose a start time that allows for the majority of the more disruptive work to be completed before the lobby opens. While the physical installation doesn't necessarily make a lot of noise, there will be several extra

people in the branch; so, you'll want to schedule plan the start time accordingly. From start to finish, the complete installation can take from a little as 45 minutes, up to 3 hours, depending on the location, the maneuverability within the facility and the number of machines installed.

The installation is carefully reviewed

Once the physical installation is complete, the installation team should clean up all of the packing materials, conduct the necessary hardware training and complete an installation checklist for you to sign. This is a great opportunity for you to review the entire installation process with the crew and make your voice heard if there are any problems.

A black and white photograph of a person wearing a dark sweater, standing at a desk. The person's hands are visible, one near a cardboard box and the other near some tools. On the desk, there is a cardboard box, a roll of material, and some tools. The background is blurred, showing a window and some office equipment. A semi-transparent dark rectangle is overlaid on the center of the image, containing white text.

From start to finish, the
complete installation can
take from as little as
45 minutes up to 3 hours.

Installation Day

Here's where a detailed plan comes into play. On installation day, all those details make a difference. Be prepared to provide all the information your recycler vendor and installation team requests whether it's worksheets, forms, meetings or all of the above. The more detail the install team has about your circumstances and environment, the more comprehensive the installation plan will be.

Here are some items that may come up during installation planning. And if your install team doesn't ask these things, you might want to start the conversation.

Delivery

Know the equipment you'll be dealing with. Depending on the model, sizes and weights of recyclers can vary but usually they at least require large equipment to physically move them into the building. Consider details like which entrance should be used for delivery and verify it's big enough to accommodate the unit and the delivery equipment. It's also a good idea to walk the path from that entrance to the install location to ensure it's unobstructed by furniture,

other narrow door openings or equipment. Plan in advance for details having electrical outlets within reach of the recycler power cables. Will any cords be in walking paths and how will you address that? Is there network connectivity at the site? Is the permanent flooring place – you don't want to move the unit to lay flooring once it's installed.

All of these facilities issues are especially important if the building is still under construction. In that case, it's important to schedule delivery after electrical and network systems are completed and interior finishes are mostly done. And working bathrooms are nice since technicians might be on site for a day or two.

Work Area

If recyclers are going under existing counters, do any modifications need to be made for them to fit? And do the technicians have enough room to access connections and function during the installation process? Workstations and counters should be cleared and cleaned where the accessories need to go. (CC-5000, Printer, Coin Dispenser, etc.)

Dedicated Branch Contact

Typically, the branch manager or a project manager, there should be someone who has communicated with the install team and knows what's going on. The vendor installation team will need a reliable, informed contact in case any issues arise.

Coordinate with IT

Don't forget the IT department, during the planning and installation process. Ideally, PCs that will be connected to recyclers should have the teller app loaded before installation. If the PCs are ready to go, you'll save a lot of time during the install and integration.

Decide if you'll need an IT person from your institution on site for the installation day. Having IT at the ready can be invaluable for any connection issues or just to assist with logins and software admin rights.

Training

Usually the vendor installation technician will train employees to operate the recycler(s) as part

of installation process. The staff designated to learn the equipment and train others should be really engaged in the training. Hands on training experience is ideal and taking notes is important as there is a lot to cover in a short amount of time.

The more closely you work with your vendor's installation team, the more smoothly installation and setup will go.



Ask the Expert

An interview with security and risk management expert Michael Bacon

The former EVP and Head of Global Security and Internal investigations for Wells Fargo.

Michael Bacon is a 27 year veteran of the corporate world of risk management, audit, fraud, security, HR, and investigations. As Founder and Managing Partner of Rezolvrizk, Michael provides professional expertise and resources to assist clients in assessing, analyzing, and resolving risk with efficient and effective solutions.

At Wells Fargo, Mr. Bacon served as the Executive Vice President and Chief Security Officer leading 10 divisions collectively responsible for

security and internal investigations at over 10,000 locations across the U.S. and in 36 other countries. Prior to Wells Fargo, he served in a variety of capacities and leadership positions for thirteen years at Bank of America.

He is a vetted member of the International Association of Professional Security Consultants and the International Association for Healthcare Security & Safety.

How can a bank make their branch less of a target for a robbery?

Great question.

First of all recognizing the risk. You know, recognizing that the risk exists. For (a bank) to just acknowledge, "Wow, we could be robbed," is one of the first steps because a lot of banks get complacent around robberies if they haven't been robbed. Secondly, certainly understanding what that risk is. We love to perform risk assessments where they can sit back and compare themselves to the other banks or credit unions within their area and benchmark. What are those banks doing or not doing, have they been robbed, have there been robberies in the city or town that they're located in? And, you know compare. So recognizing the risk and then benchmarking and understanding what your peers are doing and then taking action. Ensuring that your equipment is sufficient, you know, it doesn't have to be the latest technology but does it work? Does the video system produce quality

images? Do the alarms work at the time? And then lastly, and probably most importantly, is ensuring that the training is conducted and that employees know how to identify suspicious behavior, know what to do if someone is acting suspicious and then certainly if there's an incident of a bank robbery, that they would know how to respond appropriately. I think all three of those are key components.

How do non-traditional branch designs affect branch security?

There's an interesting challenge with cash recyclers. This is an interesting device, a great device. But to think we have branches now that are technically cashless without manual drawers is an interesting concept.

There's an upside to it, and I can touch on that from an embezzlement standpoint. It certainly nearly eliminates the risk for embezzlement.

But on the other side it's created, at least for some of our clients, the question of how do you react in a bank robbery setting? In all of the new designs people are in closer contact with fewer physical barriers. That in itself is a different type of training.

Also, robbers are not used to recyclers yet, there not being a cash drawer. So in case of a robbery, you have to plan for:

- How much money do we dispense to give to the individual?
- How much is enough?
- Are employees trained at knowing how to dispense the fake money, if you will?

So just different applications, very similar to traditional bank security and bank security training, but there's going to be different scenarios and we've got to prepare for that and train for that.

So, are process changes a key consideration when you're dealing with the technology in a branch?

Absolutely.

I'm a security professional, and we're all about reoccurring risk assessments and as conditions change, you too must reassess your risk. If hours change, that could pose a different risk. If your customer base changes, that could pose a risk. Anything from a redesign or a remodel is fairly drastic change

and as you're alluding to, some of the transformation of these branches, definitely requires a step back and a reassessment. Ensuring that we revisit and look at our security procedures, our policies and our equipment and our training approaches to make sure that they address any risk that we see in this new, transformed branch.

Something I don't really touch on very often when we talk about cash recyclers is internal theft.

I'm in the prevention business. I want to take all of my experience and try to bring safer, more secure, more ethical environments to banks and to credit unions.

With internal fraud, it's not just the embezzlement, it's the loss of an employee. It's the cost of hiring and then losing an employee around an criminal action. Then the process of hiring, replacing and training that individual. So embezzlement is a costly event from a financial and personnel perspective.

The loss of an employee for misconduct is quite impactful as well. It's a co-worker, a friend, somebody you trusted.

So if we can prevent this activity, break the cycle and the opportunity, it's a huge win for any financial institution.





Post Install – What Now?



Hardware & Software Training

Your recycler vendor should provide services to install, test, integrate and train your staff to use your new recycler(s) in your environment.

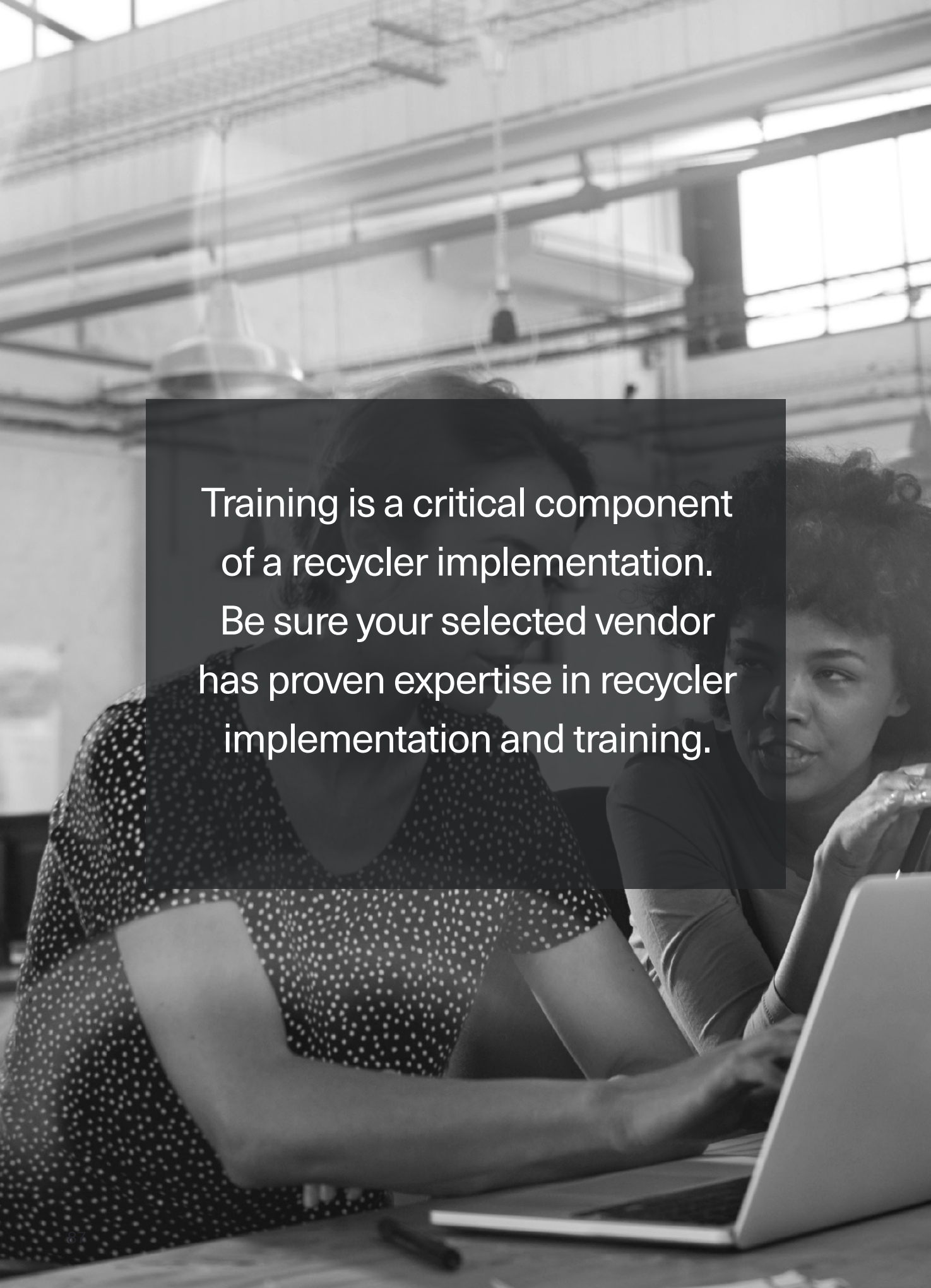
Once the recycler(s) are installed on site, the installation technician will run them through extensive tests to verify the equipment is 100% functional. At the end of the installation, the unit(s) will be verified as fully functional and ready to use.

Your installation technician will also integrate the recycler(s) into your environment. That means setting them up so they are connected to your software and operating on your network, regardless of the integration method you choose.

With recyclers automating many of your manual cash procedures, you'll need to work with your installation technician to evaluate processes and correlate them to the cash management software and recycler features. New procedures

will be developed around the accuracy, efficiency and security impacts of automating manual cash processes. Typically, new procedures will be reviewed with users and management, and then documented.

Finally, the installation technician will train your cash management system tellers to use newly installed unit(s) using your teller software and the new procedures. You'll cover hardware topics like offline cash transactions, start up and shutdown, correcting hardware errors, and simple troubleshooting. Software training should include procedures like performing dispense and deposit transactions through your teller software and end of day balancing. Thorough training should include working with individuals until they display proficiency in performing the new processes. When training is complete, your vendor will provide guides and other materials to use as reference and to train other associates.

A black and white photograph of two women in a modern office environment. The woman on the left, wearing a dark polka-dot top, is seated and looking at a laptop. The woman on the right, with curly hair, is leaning in and looking at the same laptop. The background shows a large, open-plan office space with high ceilings, exposed ductwork, and large windows. A semi-transparent dark rectangle is overlaid on the image, containing white text.

Training is a critical component
of a recycler implementation.
Be sure your selected vendor
has proven expertise in recycler
implementation and training.

Cross Training Employees

Cross training isn't really part of recycler installation training, but it's definitely a pleasant side effect.

Once your staff is proficient in an automated cash environment, there will be time for high-value activities like cross training. Few things are more valuable and efficient than employees who can step into other roles when necessary.

A cross-trained staff allows management to maximize internal resources and realize benefits like more scheduling flexibility and increased employee retention which translates to saving the costs of new hires. And for associates, it can reduce job stress, increase job satisfaction and provide growth opportunities.

Cross Selling 101

No one will deny that cross selling can improve the bottom line.

The incremental cost of selling to existing customers is much lower than acquiring new ones. Plus, having a larger share of wallet makes it harder for customers to move their business elsewhere. In response, there's been a significant push to capitalize on the branch visit with cross selling. And cash recyclers certainly give employees more time to interact with customers and the opportunity to offer products. But most tellers won't become cross-selling machines overnight. They need to be trained to listen to customers' needs and taught how to help them solve financial problems.

Here are some things to keep in mind when designing a cross selling training course.

Know which products customers like.

Sometimes called "sticky" products, it's a good idea to determine which ones keep customers walking through your doors – and asking for more.

Understanding which products add the most value and focusing on cross selling those will help generate loyalty. Look for products and services that have features unique to your institution and offer savings in time or money.

Focus on guidance, sales and service in the branches. As more customers move daily transactions online and through automated systems, bank staff should focus on listening to customers and offering guidance to help with problems. That means that customers will likely come in with more complex problems, providing an opening for selling more products.

Ask for the sale. While loyalty and trust are important in making sales, nearly one-third of banking products in the U.S. are sold. In other words, you have to ask customers to make a purchase, whether it's in-person or through marketing materials.

Hardware Cleaning

Just like anything else, a recycler can collect dust and debris from the air, carpeting and cash itself. Dirt and oils from all those bills can build up on sensors and belts over time and affect how accurately a sensor reads or how well a belt moves.

A lot of problems like misfeeds and jams are caused by dirt build-up and can be prevented with regular cleaning. Your recycler should include a cleaning kit with the tools to make the job quick and easy. These tools are designed to get to hard-to-reach areas and include items like lint-free cloths and cleaning solutions that are safe to use on parts such as photo sensors and rollers. Your installation technician can recommend a cleaning schedule, show you how to use your cleaning tools and how to order more.

What does a cash recycler mean for my customers and members?

Cultivating a strong relationship with your member base is paramount to growing a successful business. Developing and maintaining this relationship takes time and effort.

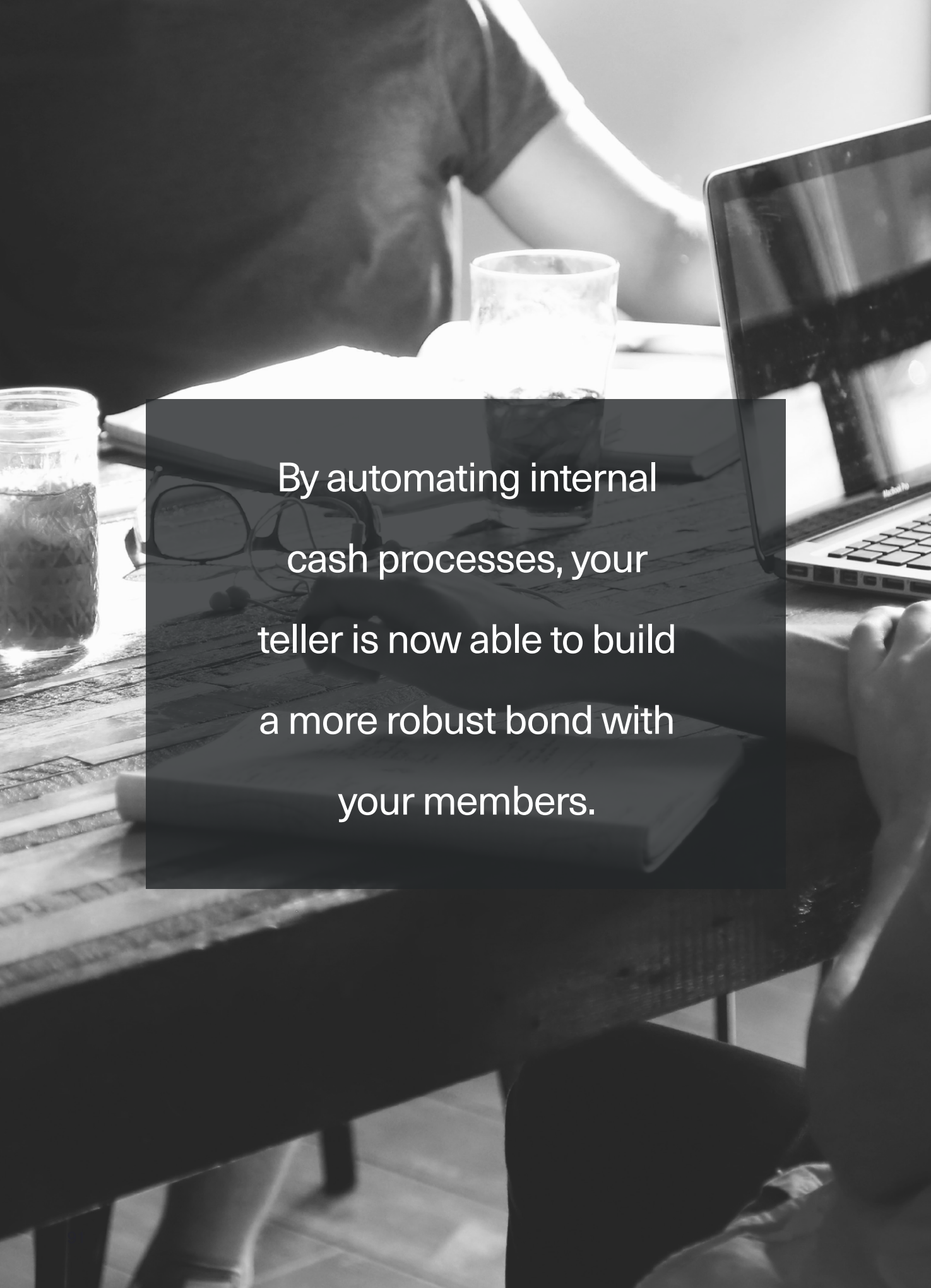
By automating internal cash processes, your teller is now able to build a more robust bond with your members.

Transitioning your branch to an automated cash system requires an in-depth look at internal processes.

Often overlooked is the effect that this change will have on the member.

Questions can arise and it's a good idea to take a proactive approach to addressing their concerns.

In the first few weeks after installation, members might initially ask for a teller to count bills back to them manually. This is a common occurrence and the best practice is for the teller to comply. As members become more familiar with the machines, this will occur less frequently.

A black and white photograph of a person working at a desk. The person is wearing a dark t-shirt and is partially visible from the chest down. On the desk, there is a laptop on the right, a glass of water in the center, a pair of glasses on the left, and some papers. The background is slightly blurred, showing a window and some office equipment. A semi-transparent dark rectangle is overlaid on the center of the image, containing white text.

By automating internal
cash processes, your
teller is now able to build
a more robust bond with
your members.

Commercial Cash Deposit Analysis

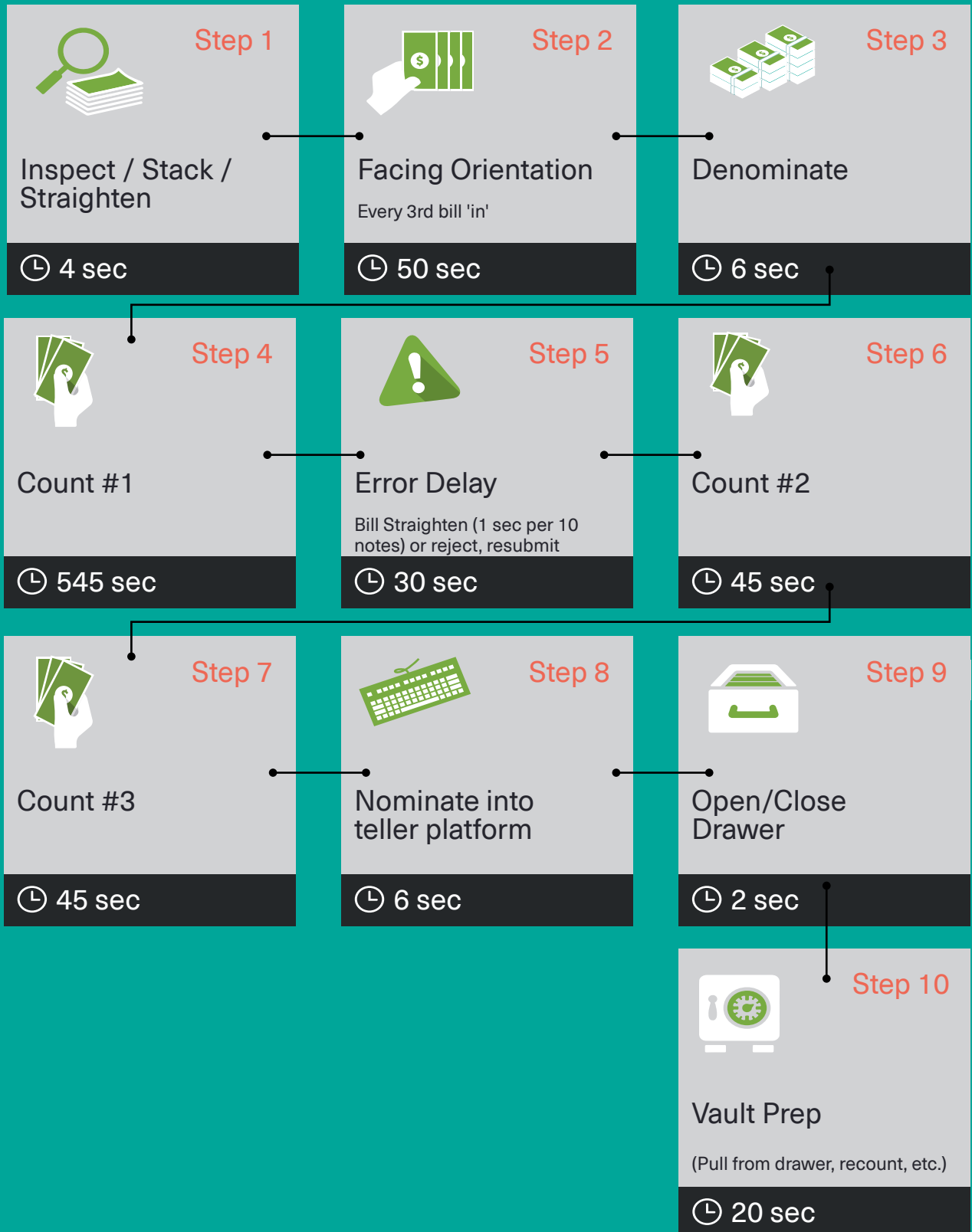
Manual vs Automated

We examined the cash-in processes for personal (consumer) and commercial accounts at hundreds of banks in North America. We used stopwatches to time transactions, took detailed notes on the steps, and thoroughly interviewed bank tellers on their internal bank processes. The results for commercial deposit processes are summarized on the following pages.

Commercial Transaction

Manual to Drawer

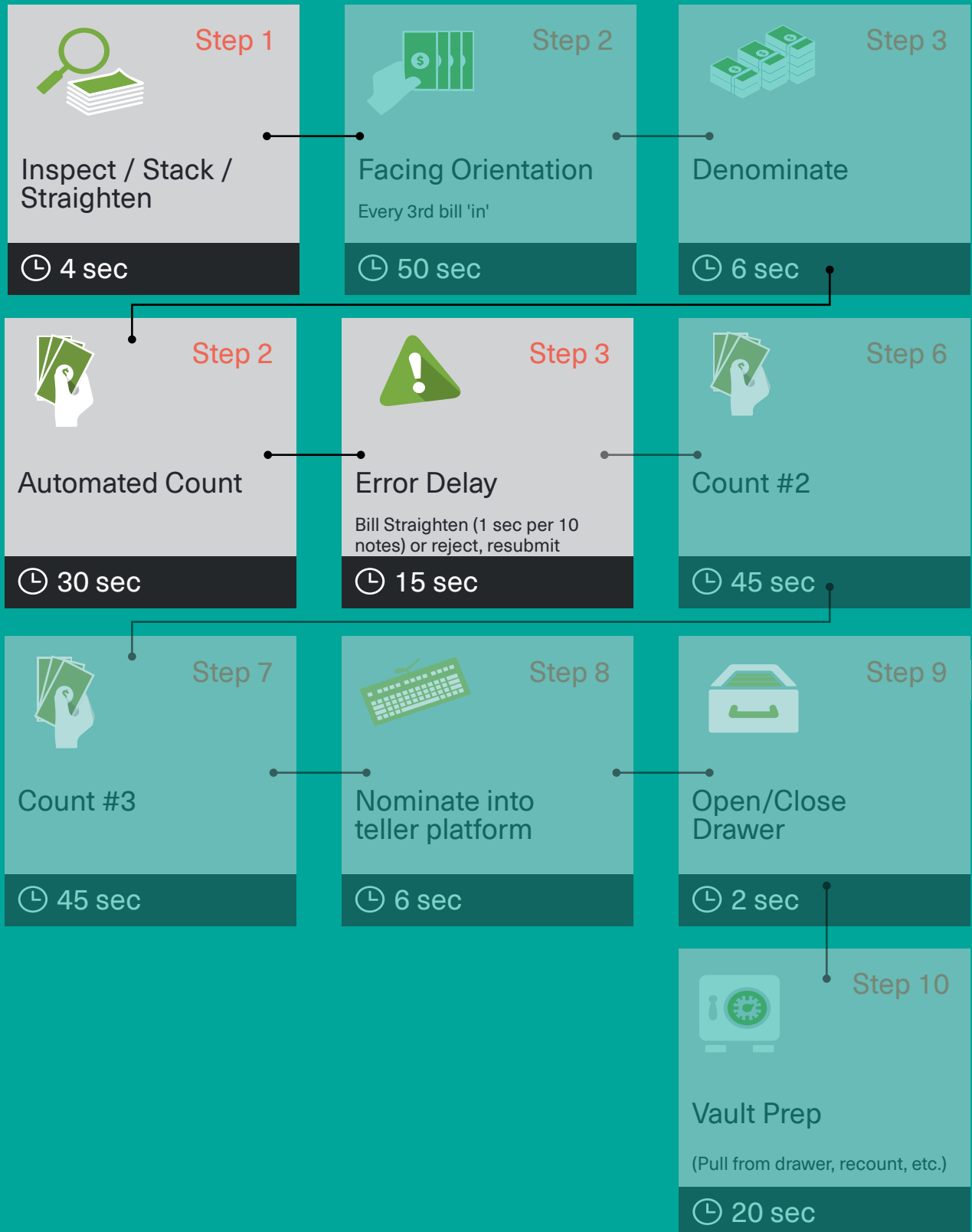
Notes: 150 | Count Rate per Note: 0.3 sec



Commercial Transaction

Automated to Safe

Notes: 150 | Count Rate per Note: 0.2 sec



Difference

10 ⌚
Steps 4:13.0

Time Savings with
Automation

⌚ ✓
03:24.0

3 ⌚
Steps 0:49.0



What Does a Cash Recycler Cost?



Things to Consider When Investing In a Cash Recycler

Pressure to control operating costs and enhance teller functionality has led many financial institutions to consider implementing teller cash recyclers in their branches.

Unfortunately, determining a fair price or calculating return on investment isn't always straightforward. In as much as no two branches are alike, there isn't a one-size-fits-all method for evaluating solution configuration and therefore price. What follows is an outline of the pricing elements worth considering when examining your teller cash recycler investment.

Hardware

The advancement of TCR technology has led to a broader range of configurations and features, making them more accessible and adaptable.

This progress has resulted in a wider array of options and more tailored solutions to meet specific branch requirements. Configuring recyclers to meet the unique needs of individual branches requires analyzing branch data around transactions, cash volume, staffing, and security. It is crucial to conduct an in-depth branch analysis to determine the correct recycler model and configuration. Depending on the recycler's features (and quality), you'll find a wide range of prices between brands.

Integration

Integration is the "secret sauce" of teller cash recycler adoption. At the end of the day, the method leveraged to integrate hardware with your teller application will have a significant impact on productivity gains, teller adoption and overall return on investment.

There are three basic approaches - standalone, middleware (soft integration) and direct integration. Each boasts pros and cons worthy of further consideration.

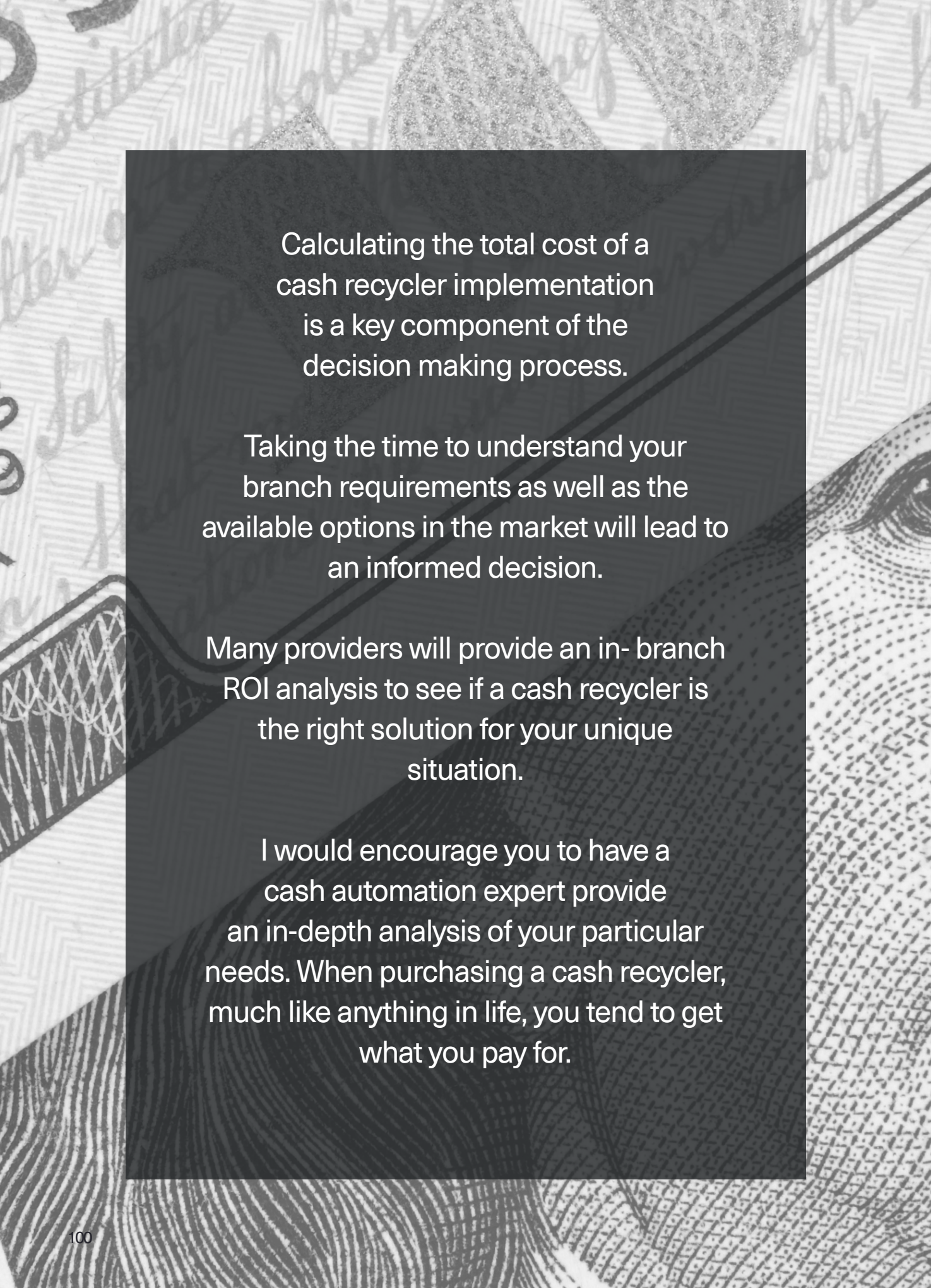
Installation and Training

Ensuring effective adoption of teller cash recyclers is largely dependent on robust user training. Cutting corners to save on training undercuts the inherent value found in the hardware and integration elements of the overall solution. Be certain your selected vendor is a teller cash recycler expert, capable of not only teaching staff how to use the recycler in ideal conditions but also preparing them to recover from exceptional conditions. The importance of proper training cannot be stressed enough.

Onsite Service and Preventative Maintenance

Realizing maximum return from investment in cash recyclers requires partnership with capable service providers. Cash can be dirty and difficult to manage. To protect and optimize your investment, it's a good idea to work with an organization that has significant tech coverage and a plan for proactive preventative maintenance based on device throughput.

Cutting back on service investment is yet another way many organizations fail to attain expected results from recycler adoption. It's important to research response time, preventative maintenance procedures, and remote monitoring capabilities thoroughly.

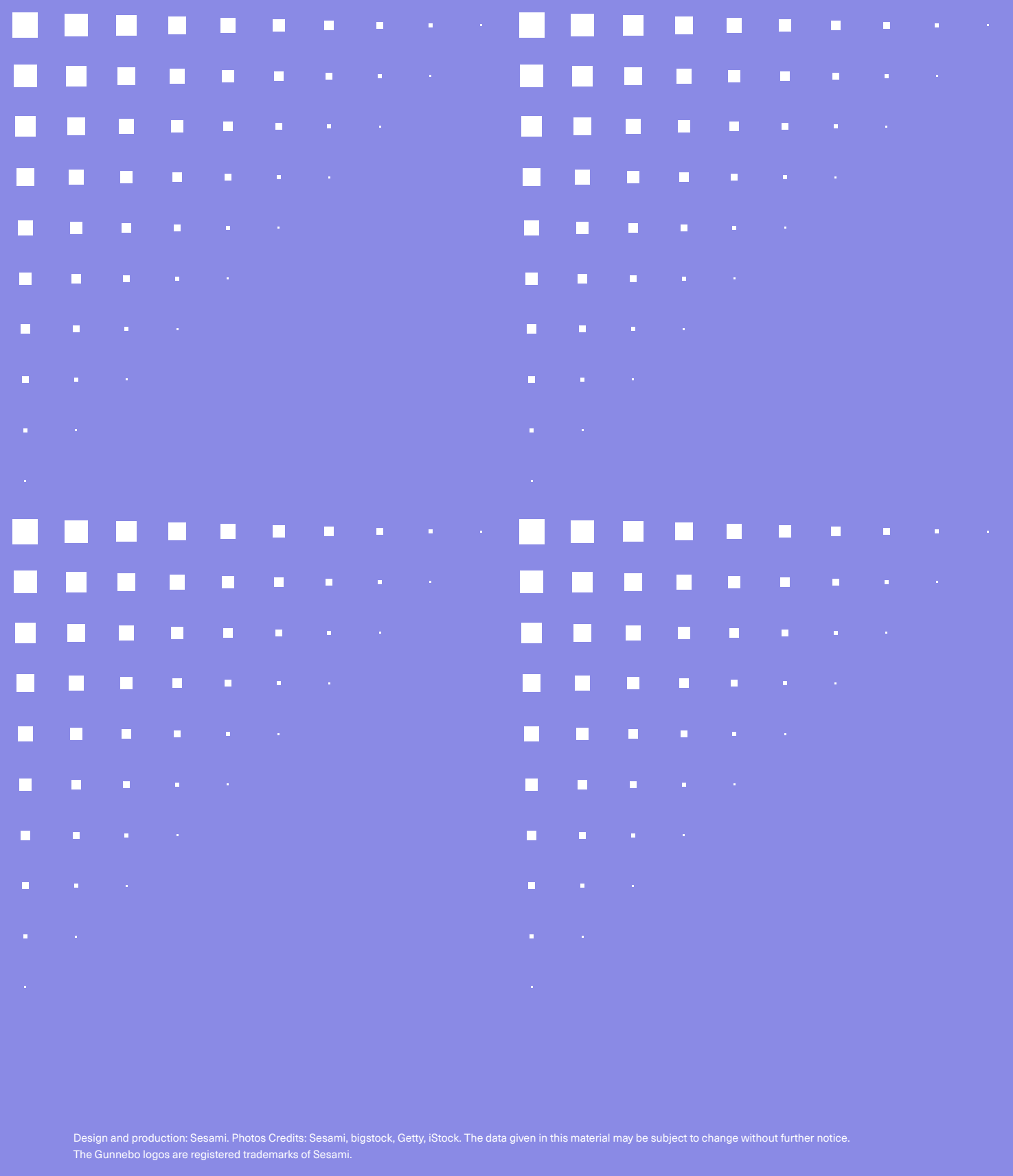


Calculating the total cost of a cash recycler implementation is a key component of the decision making process.

Taking the time to understand your branch requirements as well as the available options in the market will lead to an informed decision.

Many providers will provide an in-branch ROI analysis to see if a cash recycler is the right solution for your unique situation.

I would encourage you to have a cash automation expert provide an in-depth analysis of your particular needs. When purchasing a cash recycler, much like anything in life, you tend to get what you pay for.



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