RUBICON

Toward a Future Without Waste

2019
ENVIRONMENTAL,
SOCIAL, AND
GOVERNANCE REPORT

A Letter From Our CEO

When we launched Rubicon® in 2008, we wanted to solve the problem of waste. We made an early strategic decision to use every tool in our arsenal—customer centricity, small business empowerment, and the strength of digital platforms and data—to transform a stagnating industry whose business model was a threat to the health of our planet. In that time, I cannot remember a single day where I did not get up in the morning excited about the work ahead and the opportunity to disrupt an industry that was badly in need of transformation.

You cannot disrupt the status quo if you are not willing to do everything differently. From day one, we have sought to do business differently than any of our competitors. That is why in 2012, Rubicon was one of the first companies to become a Certified B Corporation—a clear signal of our intention to do business in a responsible, sustainable, and ethical way. Since that time, Rubicon has built a talented team and a people-centric culture. Passionate, idea-driven, globally aware and socially-minded, Rubicon's people are incredible, and whatever successes we achieve are due to their collective efforts, creativity and energy.

Our mission to end waste is the fuel for our success. Today, waste is a clear and present danger to our environment, economy, security, and health. The collection, burial, and burning of waste is an environmental disaster, creating poisons and toxins that may be with us for centuries. Every generation leaves behind a legacy. Ancient Rome left behind engineering marvels, including the first major forms of urban sanitation. We risk making our own legacy a thick layer of garbage and waste, covering vast spaces of both land and ocean, choking life out of the soil, water, and air. Is that what we want?

At Rubicon, we want to leave a positive mark on history with environmental innovation, industrial transformation, and market-oriented solutions—all targeting the problem of waste. We are going to do everything in our power to reduce the amount of waste going into landfills, to create far greater incentives to recycle, to build and deploy systems to make it far easier to recycle, and to create a truly circular, free market economy.

In 2012, Rubicon was one of the first companies to become a Certified B Corporation.

If we get this right, we may not solve all of the globe's environmental problems, but we will solve one of the biggest and most costly ones. And we will demonstrate that the United States can and will lead on this issue.

We also hope to save our economic system from one of its worst features. For most of early human history, waste was an afterthought. Waste existed, but humankind often reused or recycled as much of it as possible. Most people lived in a circular economy, wasting little and squeezing value out of their resources. They could not afford to waste a thing.

The Industrial Age changed that approach to consumption. Today, along with vast growth in prosperity and living standards, we have an industrial-scale level of waste creation and waste disposal. We have been dealing with this industrial-scale waste the same way for roughly 300 years of global industrial activity. It is ripe for disruption and ready for new approaches.

We have already begun to see the results of what we believe will be a revolution in city services: more efficiency, less downtime, fewer government funds, and perhaps most important of all, savings on taxpayer dollars.

Our insight—one of our first—was that the Digital Age will help us defeat this legacy of the Industrial Age. Today, with digital tools and platforms, we can accelerate the return to a circular economy, promoting recycling and producing the economic benefits associated with waste reduction, all while using free market-based approaches and solutions.

We began our work by analyzing the status quo and considering the logical alternatives. There are currently two ways to make money from waste. One is by setting up the equivalent of a utility, where big corporations and big government agree to a one-size-fits-all approach, charging businesses and households to haul away their waste and bury it. That is how most of our competitors make a profit.

The other is a free market-based, dynamic approach: cooperate with others and innovate to help people reduce or reuse more of their waste—and inspire a new generation to build on our progress to bring about the end of waste as we know it. This is Rubicon's approach.

We are educating and informing customers about how to improve recycling. We are empowering smaller haulers who are incentivized to reduce landfill use. We are building a digital platform and Internet of Things-enabled waste system for city governments and other municipalities to use to manage their own waste streams. We have helped them transform their solid waste fleets into roaming data collection centers capable of collecting a swath of real-time data on waste and recycling efforts, not to mention community insights, including potholes, vacant homes, and graffiti. We have already begun to see the results of what we believe will be a revolution in city services: more efficiency, less downtime, fewer government funds, and perhaps most important of all, savings on taxpayer dollars.

In all of these approaches, we are shifting the focus from making money from the collection and burial of waste to reducing waste, increasing recycling, and using less landfill space.

But so much work is yet to be done—and Rubicon looks forward to contributing to these discussions and inspiring others to get more involved. As a society, we have to solve the problem of a surplus of recycling materials and weak demand for those materials. We will have to figure out how to pay for the infrastructure, write the rules of the market, and build the systems. We have to solve the problem of who bears the burden of cost for collecting and processing recycling materials, and who gains the value? We have to solve the problem of scale: after all, waste on an industrial scale is not going to be eliminated by recycling on an artisanal scale.

For too long, these ideas were dismissed as dreams. Today, through our efforts, we are making real progress. People across the ideological spectrum agree that waste deserves more than a utility-based, one-size-fits-all approach.

I'm proud that we're offering more than that—we have always deserved better than the status quo when it comes to waste management. People should expect better waste capture, smarter waste systems, and a lifetime of value from everything we produce.

I should add that my personal passion for Rubicon and its mission stems in part from my faith in America. Our country is a leader in virtually every dimension of technological progress. But on the environment, we are more of a follower—and it does not have to be that way. When China told us it would no longer take our recyclable materials, that was a wake-up call.

We are a nation that knows how to solve big problems when we set our minds to it. Waste is a big problem, and we should not wait for someone else to try to solve it. We should do the work, we should use innovation and free markets to drive transformation, and we should build a stronger, more resilient economy in the process.

I believe that out-of-control waste weakens us as a nation. We may all create waste, but only some of us bear the weight of waste's ill-effects. Our nation's poorest and most vulnerable members are most exposed to pollution from waste. Therefore, reducing that impact, and ridding our world of waste is, to me, an act of fairness and moral justice.

We have good reason to act. For a decade, we have been pursuing real solutions. I look forward to highlighting Rubicon's sustainability accomplishments in our annual Environmental, Social, and Governance (ESG) report, and I cannot wait for what we accomplish next.

Nate Morris
Founder and CEO
Rubicon

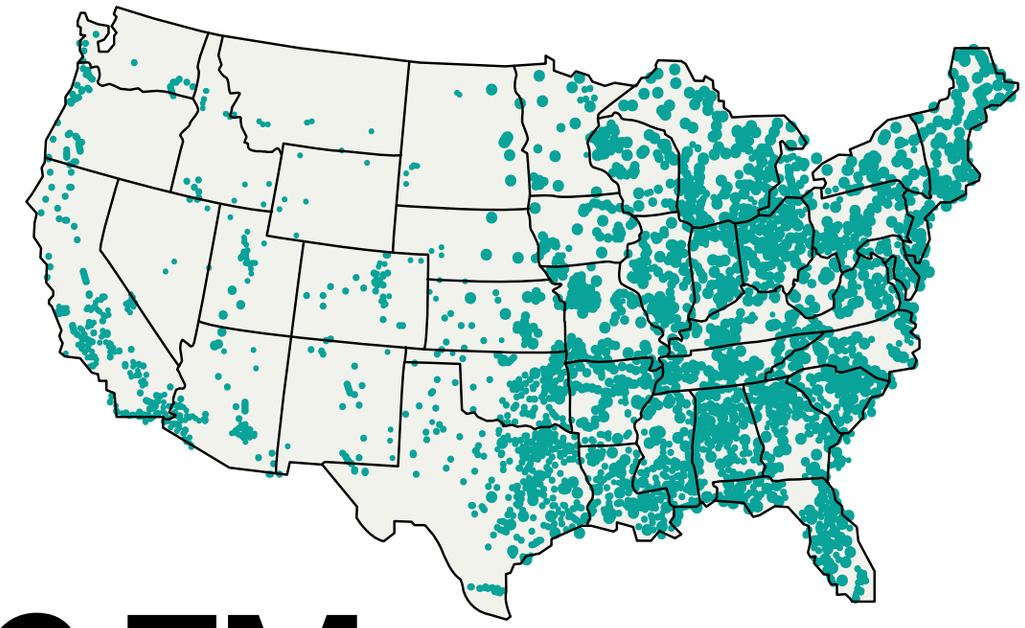
About Rubicon

Through our technology, Rubicon is transforming the entire category of waste and recycling. Rubicon's mission is to end waste, in all of its forms, by helping its partners find economic value in their waste streams and confidently execute on their sustainability goals. We provide our clients a suite of SaaS products for waste, recycling, and smart city solutions; and we collect and analyze data for businesses and governments worldwide.

Rubicon is one of the earliest and largest Certified B Corporations. We have undergone recertifications twice since our first certification in 2012, improving our overall score each time, as a result of our continued pursuit of our mission to end waste and to demonstrate that business can be a force for good. In 2018 and 2019, B Lab, the parent organization for B Corps, recognized Rubicon as a "Best For The World" honoree for our environmental performance and sustainable business practices, ranking us in the top 10% of all B Corps for our environmental responsibility. In 2018, B Lab recognized Rubicon as a "Best For The World" honoree in governance, an accolade given to B Corps who "walk the walk every day through exemplary governance practices."[1]

With more than 2.7 million user service locations worldwide, Rubicon is headquartered in Atlanta, Georgia, and has core teams in New York City, San Francisco, St. Louis, and Tinton Falls, New Jersey. Rubicon has been named a Great Place to Work® for three consecutive years (2018–2020), and was recognized as one of Glassdoor's "11 Companies With Seriously Impressive Benefits" in 2018.

From our founding, we have been committed to doing business in a way that prioritizes environmental and social sustainability. While this report frames Rubicon's achievements mostly through an environmental lens, our sustainability platform also prioritizes social and governance considerations, which we understand to be crucial in our ability to generate long-term value for our stakeholders. In 2019, we took steps to address several social and governance issues that we consider relevant to our continued success.



2.7M

user service locations

Employee Health and Wellbeing

The wellbeing of our workforce is a priority—research consistently shows that healthy, happy employees are productive employees.[2] Accordingly, we invest heavily in our workforce, taking the following measures to help our employees lead fulfilled lives:

– Rubicon pays 100% of health insurance premiums—employees see no health insurance deductions from their paycheck.
– Rubicon provides six weeks of paid maternity leave with an additional four weeks for each year employed at Rubicon, capping at 14 weeks. Rubicon also offers 11 days of paid paternity leave.
– Rubicon provides unlimited paid time off to full-time exempt employees and paid time off for all company-sponsored volunteer events.
– Rubicon offers employees flexible work schedules and telecommuting options.

Diversity and Inclusion

Studies show that a diverse workforce makes better decisions, resulting in better business outcomes.[3] At Rubicon, we prize diversity and have established affinity groups to promote inclusivity in the workplace. Each of our affinity groups, listed below, is sponsored by a member of our Executive Leadership Team:

– African-American
– Latinx
– LGBTQ+
– Veterans
– Women in Leadership

We pay 100% of health insurance premiums.

Data Security and Customer Privacy

As a company working in the SaaS space, we generate and store significant amounts of data, and it's imperative we keep that data secure. As a result, we have established a best-in-class information security management system, and are working toward achieving ISO 27001 certification. We anticipate completing the certification process later in 2020.

Business Ethics

We are a purpose and value-driven organization and are committed to operating our business ethically. To ensure we are operating in accordance with our core values, we've adopted policies and safeguards, which include:

– A whistleblower hotline that allows employees to report unethical behavior confidentially
– Anti-corruption and anti-bribery policies
– A comprehensive Code of Ethics
– A CEO policy that governs ethical practices in the Office of the CEO
– Corporate governing documents to require that company practices take into account the needs of employees, the community, and the environment

Management of Regulatory Environment

The regulatory environment, especially as it concerns waste management, is dynamic. Our Public Policy team monitors the regulatory landscape so that we are prepared for, and responsive to, changing legislation. On a monthly basis we produce a report summarizing all relevant changing regulations, which we communicate to impacted internal and external stakeholders. Additionally, we've undertaken an analysis to ensure the company is licensed in all 50 states and is complying with any potentially applicable reporting requirements. As a result of our work, in 2019 we received no significant fines or non-monetary sanctions for non-compliance with any laws and/or regulations.

Minimizing Effects at Home

Given that our mission is to end waste, we try to be very conscious about the resources we use. There are a few steps we have taken to minimize our environmental impact:

– Our Atlanta headquarters is located in a LEED Gold building.

– Our Atlanta headquarters is on a MARTA metro line, with 36% of our Atlanta employees using monthly MARTA passes paid for by Rubicon, cutting down on emissions related to commuting.

– We avoid disposable or single-use plastic items across our offices.

– We have recycling containers for almost everything—including e-waste, plastic bags, candy wrappers, batteries, and pens and pencils in our offices.

– We offer in-office composting to our employees. Since 2017, our Atlanta headquarters has diverted 28,147 pounds of food waste from the landfill, creating 7,037 pounds of compost.

– We've placed an emphasis on eliminating single-use plastic in our office, avoiding the disposal of 94,712 plastic water bottles and the associated 20.4 tons of CO_2 emissions. Moreover, we've kept 5,688 pounds of waste per year from the landfill through eliminating single use packaging from our office breakrooms and through using reusable mugs and cups from the Salvation Army.

IN-OFFICE COMPOSTING*

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*As of February 2020

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A Brief History of Waste

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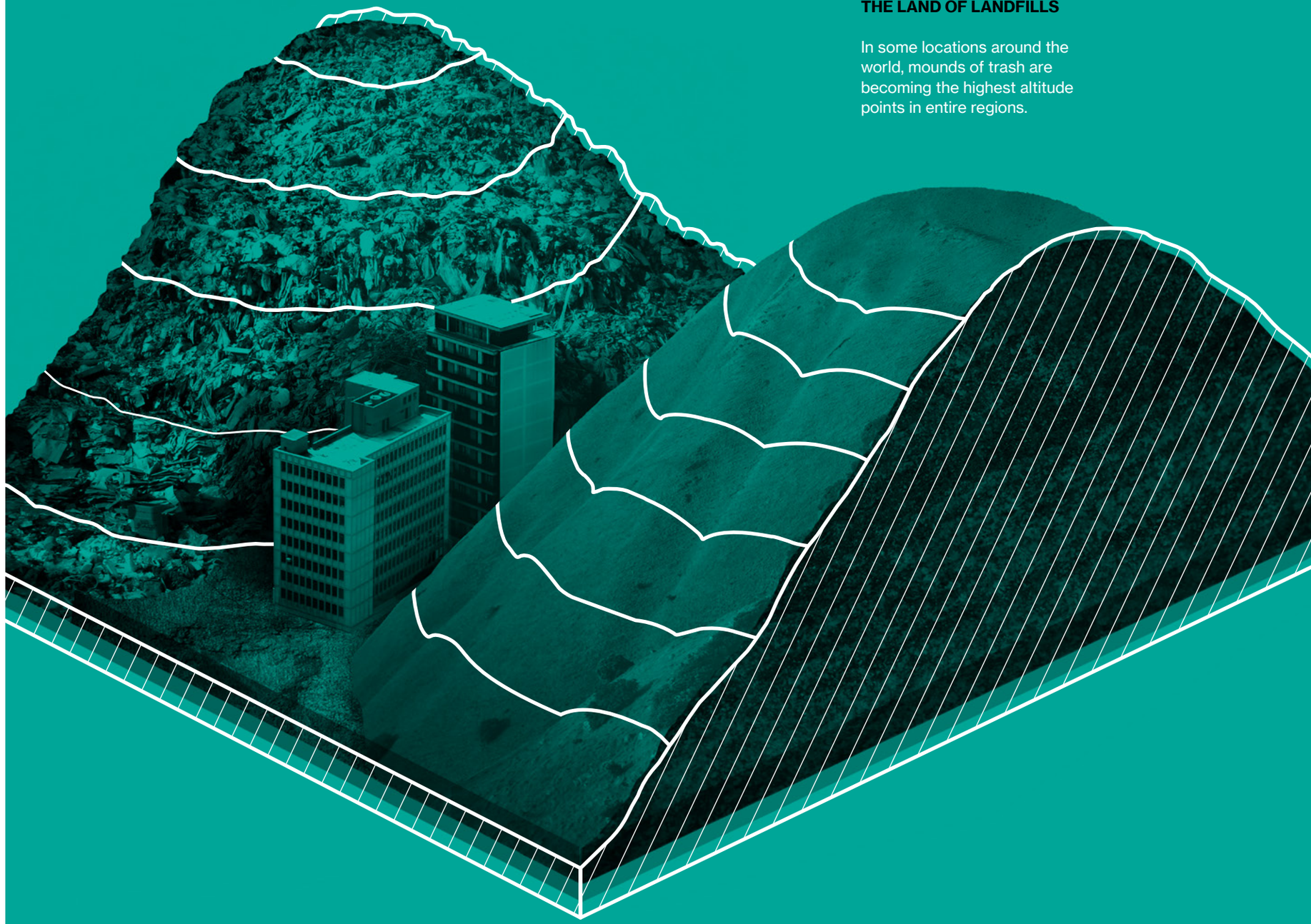
Understanding our waste problem requires a brief walk through human history.

Managing waste, the unwanted byproducts of human activity, is not a new challenge. The archaeological remains of great cities, including Rome, Jerusalem, and Paris testify to humanity's long-standing focus on managing and carrying away waste in all its forms.[4] Rome's sewer and sanitation systems—built roughly 2,500 years ago—are marvels of advanced urban engineering. Roman sewers and aqueducts allowed for relatively easy flow of fresh water into the city, and the disposal of sewage out of it.

But our relationship with trash *has* changed—today we generate much more of it, in so many different forms, with greater consequence to our health and the health of the world around us. Today, waste is so pervasive that it is becoming part of our natural world, from micro-beads of plastic now found in nearly all ocean creatures to 'plasticrust'—fugitive ocean plastics that have permanently bonded with coastal rocks.[5] In some locations, mounds of trash are fast becoming the highest altitude points in an entire region.[6]

What is now our waste crisis began during the second half of the 18th century. New manufacturing technologies allowed for production of goods at low cost and created for the first time in human history the conditions for sustained economic growth and mass consumerism.



THE LAND OF LANDFILLS

In some locations around the world, mounds of trash are becoming the highest altitude points in entire regions.

Waste is not just unsightly. It's dangerous. Dangerous to the earth, to our water and air, and dangerous to human health.

In the two centuries that followed, the global population increased sevenfold, and the gross world product grew from USD $130 billion to USD $80 trillion.[7] The global average quality of life improved dramatically, and life expectancy has more than doubled in many parts of the world.[8]

On the whole, we think it's fair to say that industrialization has allowed us to lead better, healthier lives. But the industrial revolution also marked the birth of the "linear economy."

In a linear economy, humankind arranges the entire economy along a one-way path: natural resources are extracted and processed on a massive scale. The scale allows for far greater production and use, bringing down costs and increasing access.

But the linear economy creates an enormous waste problem.[9] In addition to increases in carbon emissions in our atmosphere, the linear economy is highly correlated with waste generation.[10]

The more we make, the more we consume. The more we consume, the more we throw away. And we are making more, consuming more, and throwing away more than ever.

Waste is not just unsightly. It's dangerous. Dangerous to the earth, dangerous to our water and air, and dangerous to human health.

Waste also happens to be expensive: municipalities spend billions to have it removed.

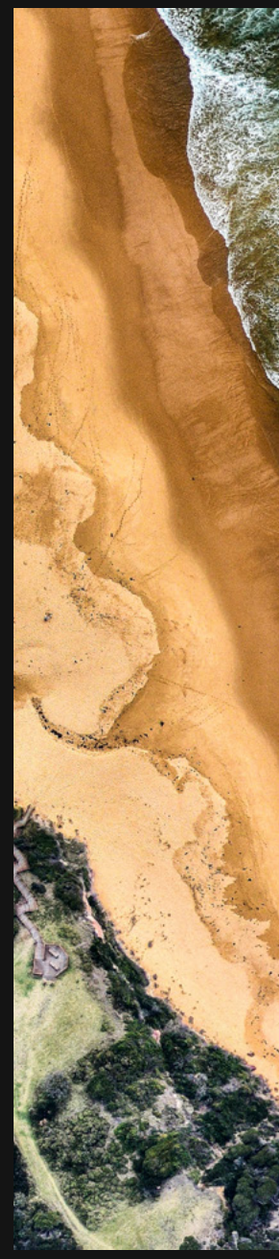
Regular exposure to certain hazardous wastes has been shown to increase cancer risks.[11] When waste is mismanaged—dumped near water sources, for example—it can lead to toxic leaching into water supplies.[12]

Waste also happens to be expensive: municipalities spend billions to have it removed—and in developing regions, waste removal can be the single biggest line item in municipal budgets.[13] Instead of spending on schools, health care, parks, and other civic priorities, cities increasingly spend on trash removal and burial.

And the problem is only getting worse.

02

The Waste Wake-Up Call



The Waste Wake-Up Call

Imagine two conveyor belts stretching across the Pacific Ocean, connecting China to the United States. One of the conveyors, flowing from China to the United States, carries new products and materials—computers and electronics, textiles, and plastics—ready for American consumers. The other conveyor moves in the opposite direction—carrying scrap plastic, metal, and paper—which no longer has any useful value in the West.

In 2016, 775,000 tons of plastic, and 13.2 million tons of paper and fiber traveled from the United States to China.[14] Though much of this material was recycled, in some cases up to 30% of plastics exported to Southeast Asian nations were discarded, in many cases making their way into waterways, lakes, and oceans, at significant cost to the environment and to public health.[15]

122 MMT

of global plastic waste exports destined for China

In February 2018, the Chinese government enacted National Sword, a policy imposing strict limits on levels of waste contamination and eliminating imports of 24 types of solid waste. It was a de facto ban on scrap imports, closing off the Chinese market to Europe and North America, and sending shockwaves through the global recycling market.[16]

2018

2030

95 MMT

OF GLOBAL PLASTIC DISPLACED BY CHINA IMPORT RESTRICTIONS

217 MMT

of global plastic waste exports destined for China

More than two years later, the effects are still being felt.

China had for decades been the market of choice for tons of recyclable waste—some of it scrap metal, some of it paper, and some of it glass. It would be shipped on barges to China by the ton, often from the United States, which was its biggest supplier. China put significant efforts into using what it could, and burying or burning the rest.

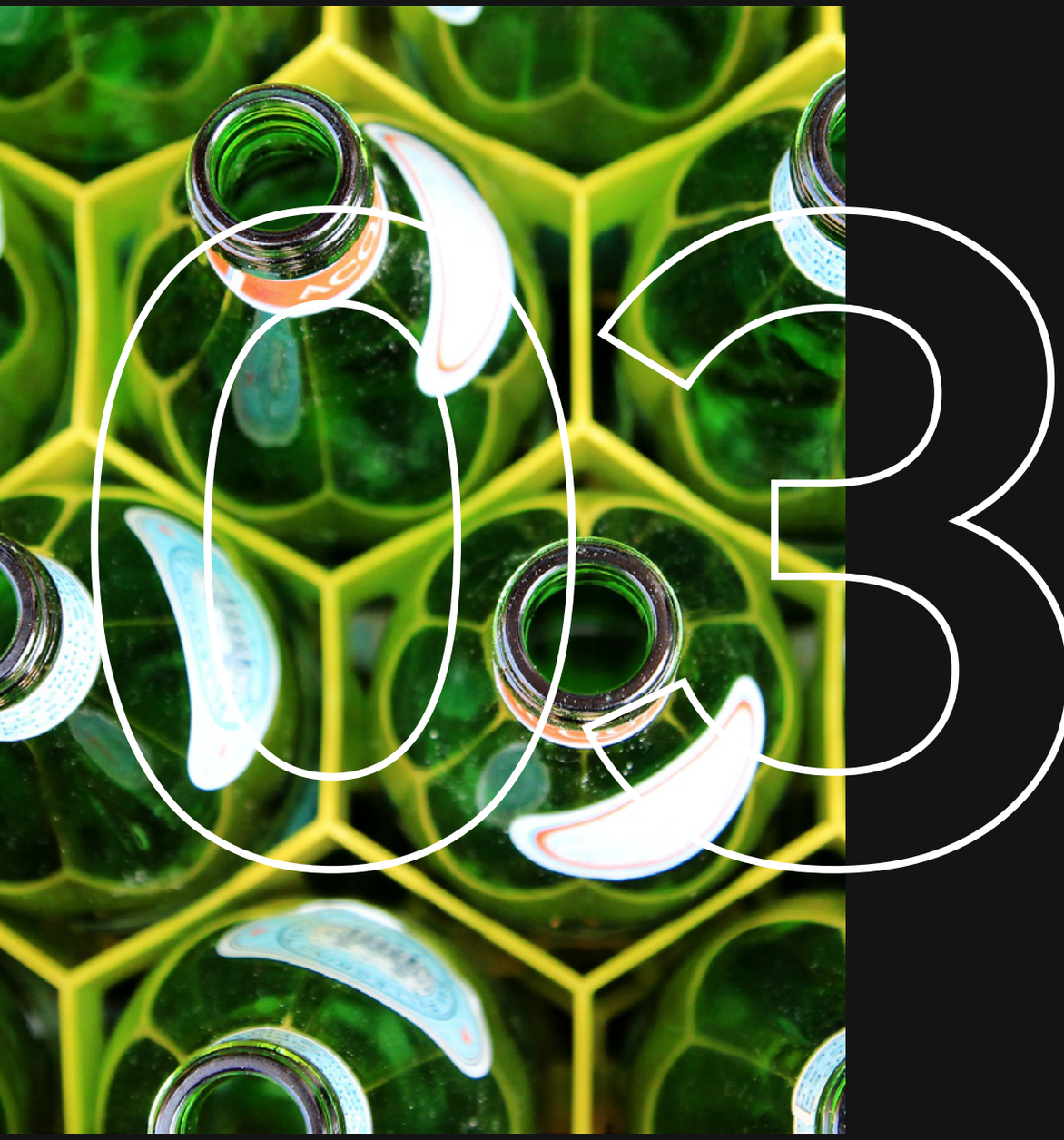
Today, as a result of National Sword, some waste haulers in the United States are forced to charge higher costs to dispose of recycling waste due to their inability to find an end market, or because of an absence of domestic recycling infrastructure. Cities and counties have to either pay these higher prices to see their recyclable waste processed, or just throw it in a landfill. One municipality in New Hampshire used to recoup $6 a ton from its recyclable waste; now it has to pay $125 a ton to have it recycled or $68 a ton to incinerate it.[17]

With economics like these, some cities have suspended or reduced their recycling programs, reduced the number of pickups per month, or cut back on accepted materials.[18]

Western countries have tried to identify alternative outlets—Southeast Asian nations, like Malaysia, Thailand, Vietnam, and the Philippines—but those outlets are also being closed off.[19]

Between 2018–2030, an estimated cumulative 95 million metric tons of plastic waste—once headed to China—will be displaced as a result of import restrictions and need to find a new home.[20] This crisis has accelerated Rubicon's mission to end waste, and our motivation in promoting a circular economy. We see this as an urgent priority.

We believe that with innovation, investment, and consumer-driven demand, we can build the infrastructure and domestic markets for recycled goods necessary for a circular economy.



03

Our Vision: A Future Without Waste

Our Vision: A Future Without Waste

Now that China has stopped accepting many plastics and roughly a third of mixed paper,[21] that waste must find a new end destination. In the United States, approximately 65% of waste is landfill-bound.[22]

Circular thinking reimagines the relationship between the economy and the natural world, and aims to turn waste into something valuable. In a circular world, there is no need for giant landfills, and there will be no more giant gyres of plastic floating in the ocean. In its purest form, a circular economy generates no waste.

Achieving this circular economy will require three major strategies:[23]

01

We need to "design out" waste from products and materials.

This will target packaging in particular—the single largest source of plastic waste.[24] There are a few reasons only 9% of all plastics ever created have been recycled, one of them being that plastic isn't easily recyclable or compostable.[25] That means we need to see how we can design both packaging and products to use more recycled and recyclable materials.

02

We need to use products and materials longer.

By stretching the lifespan of a material or product, we also extend the life of its embodied carbon (the energy and emissions associated with its creation).[26]

03

We need to compost and build other regenerative systems.

For example, we need to tackle the problem of food waste. According to the UN's Food and Agricultural Organization, approximately 1.6 billion tons of food is wasted annually, and nearly all of it finds its way into landfills.[27] But if this organic material could be saved, it could be composted and return its carbon content to the soil, or be used in bioplastics, or be turned into bio-based fuels. That's a regenerative system.

At Rubicon, we believe the future is circular.

We recognize this will take the effort of billions of people, acting over generations. Success will come in small increments and giant leaps—building a foundation of sustainable raw material suppliers; developing operational processes to eliminate waste during manufacturing and distribution; and scaling up solutions that allow materials to be reused or repurposed, rather than thrown away, to name just three.

Changing habits. Changing minds.
Changing the world in small and difficult—yet impactful—steps.

There is no alternative.
Rubicon is working toward that future.

Smarter Manufacturing

Sustainable raw materials providers and waste-eliminating manufacturing and distribution processes are essential to creating products and packaging that won't live forever in landfills.

Longer Lifecycles

Frequent disposal and replacement must give way to reliable, ongoing use on a massive scale in order to dramatically reduce the energy and carbon emissions required to create the same products over and over again.

Regeneration by Design

Unused food products and end-of-life goods mustn't be destroyed or left sitting in landfills—they need to be transformed into the foundation of a new generation of materials like bioplastics, bio-fuels, and more.

Our Core Strategies

Our Core Strategies

We believe that the environmental damage caused by the Industrial Age will be addressed meaningfully by the innovations of the Digital Age. Our core technological innovations and services deploy the power of data, artificial intelligence and other key elements of the Digital Age to help people recycle better, help cities manage waste streams more efficiently, and help strengthen the market for recycled materials. In this report, we detail the way our environmental innovations, driven by applications of available technology, are reducing waste and promoting recycling and circularity.

Innovating the Hauler Network

Every day, over 20,000 hauling companies criss-cross U.S. communities and remove millions of tons of waste from dumpsters, curbsides, and other collection points.[28] The majority of these companies are often overlooked—small and medium-sized businesses that employ tens of thousands of hard-working individuals.

At Rubicon, we put these hauling partners at the center of the solution to the problem of waste, helping them thrive as an alternative to the dominant companies in the industry, who collectively own hundreds of landfills.[29]

Rubicon provides these independent haulers access to national customers they otherwise wouldn't have an opportunity to compete for due to their lack of national reach. With the technology and platform we have created, Rubicon also helps haulers design better routes, better monitor the conditions of their trucks and other vehicles, and confirm service calls. By creating a strong network of technology-enabled haulers, we are breaking the grip of the large players in the waste industry who make money off the burial or burning—and not the recycling—of waste.

20,000+ hauling companies criss-cross U.S. communities daily.

ATLAS DISPOSAL
SACRAMENTO, CA

"65% of our fleet runs on alternative fuels."

"We are working with customers of all sizes to help them understand and adapt to circular economy thinking."

COMPOST CRUSADER
ST. FRANCIS, WI

MAUI DISPOSAL
WAILUKU, HI

"We started the first green waste recycling routes in the Hawaiian Islands."

ACADIANA WASTE SERVICES
LAFAYETTE, LA

"We want to be good stewards of the resources we have been entrusted with on this planet."

The Rubicon Haul of Fame

We are proud of our hauler network. Solid waste collection is one of the five deadliest professions and these workers put their lives at risk each time they go out on a truck.[30] They also play a vital—although often forgotten—role in keeping our communities clean and sanitary.

To honor them, we created the "Haul of Fame," a weekly interview series with our hauler partners who serve on the front lines of our industry every day.

PETE & PETE CONTAINER SERVICE
CLEVELAND, OH

"Last year we recycled more than four million pounds of cardboard, 25,000 tons of clean fill, 35,000 tons of concrete, 7,000 yards of organics, and over 20,000 yards of metal."

"If Wuestco can help in making the environment a better place for the future, we are 100% in."

WUESTCO WASTE SOLUTIONS
RANDOLPH, NJ

BLUE EARTH COMPOST
HARTFORD, CT

"All the food scraps we collect create renewable energy and nutrient-rich compost."

FERTILE GROUND COOPERATIVE
OKLAHOMA CITY, OK

"Rubicon's technology has been critical to our success as a routing device for all of our waste services. It is fantastic and has really allowed us to grow our routes quickly through data and information."

ATLAS ORGANICS
SPARTANBURG, SC

"Atlas Organics is all about a circular economy train of thought, about how what we grow and use can be recycled back into the earth, and in essence trying to end waste."

MARK DUNNING INDUSTRIES (MDI)
DOTHAN, AL

"Through a cohesive and collaborative relationship and approach, we can make a difference."

ORLANDO WASTE PAPER
ORLANDO, FL

"At Orlando Waste we view the landfill as a last resort, and we work hard to bring as much as possible into the recycling stream."

Meeting Global Standards

The circular economy isn't just about better management of materials; a circular economy has the potential to improve the lives of billions of people by reducing environmental damage and waste. We are committed to sustainable economic growth. We view the United Nations Sustainable Development Goals (SDGs) as a good blueprint for doing that.

Three of the 17 goals in particular track closely with our mission. For instance, we have developed technology that allows business customers to increase the amount of waste they divert from landfills. This reflects UN SDG #9, *Industry, Innovation and Infrastructure*, which emphasizes increased investment in high-tech products.[31] Furthermore, we support the UN's assertion that technology forms the basis of efforts to reach environmental objectives.

Another relevant goal, UN SDG #11 *Sustainable Cities and Communities*, is compatible with our vision involving the promotion of sustainable cities and communities. As the UN notes, the pace of urbanization is creating significant challenges in areas such as the removal and management of solid waste.[32] Our work in helping municipalities manage their waste collection has helped local governments move closer to the UN goal of reducing the per capita environmental impact of cities by 2030.

Our core activities are also closely linked to the UN goal of substantially reducing waste generation, UN SDG #12, *Responsible Consumption and Production*.[33] Our work with haulers and businesses on efforts such as food composting demonstrates we are doing what is necessary to minimize the impact of waste on human health and the environment.

While we find inspiration in all 17 UN goals, three stand out as particularly pertinent to our work.

01 NO POVERTY

02 ZERO HUNGER

03 GOOD HEALTH AND WELL-BEING

04 QUALITY EDUCATION

05 GENDER EQUALITY

06 CLEAN WATER AND SANITATION

07 AFFORDABLE AND CLEAN ENERGY

08 DECENT WORK AND ECONOMIC GROWTH

09 INDUSTRY, INNOVATION AND INFRASTRUCTURE

"Technological progress is the foundation of efforts to achieve environmental objectives, such as increased resource and energy efficiency."

10 REDUCED INEQUALITIES

11 SUSTAINABLE CITIES AND COMMUNITIES

"There needs to be a future in which cities provide opportunities for all, with access to basic services, energy, housing, transportation and more."

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

"Since sustainable consumption and production aims at 'doing more and better with less,' net welfare gains from economic activities can increase by reducing resource use, degradation and pollution along the whole life cycle, while increasing quality of life."

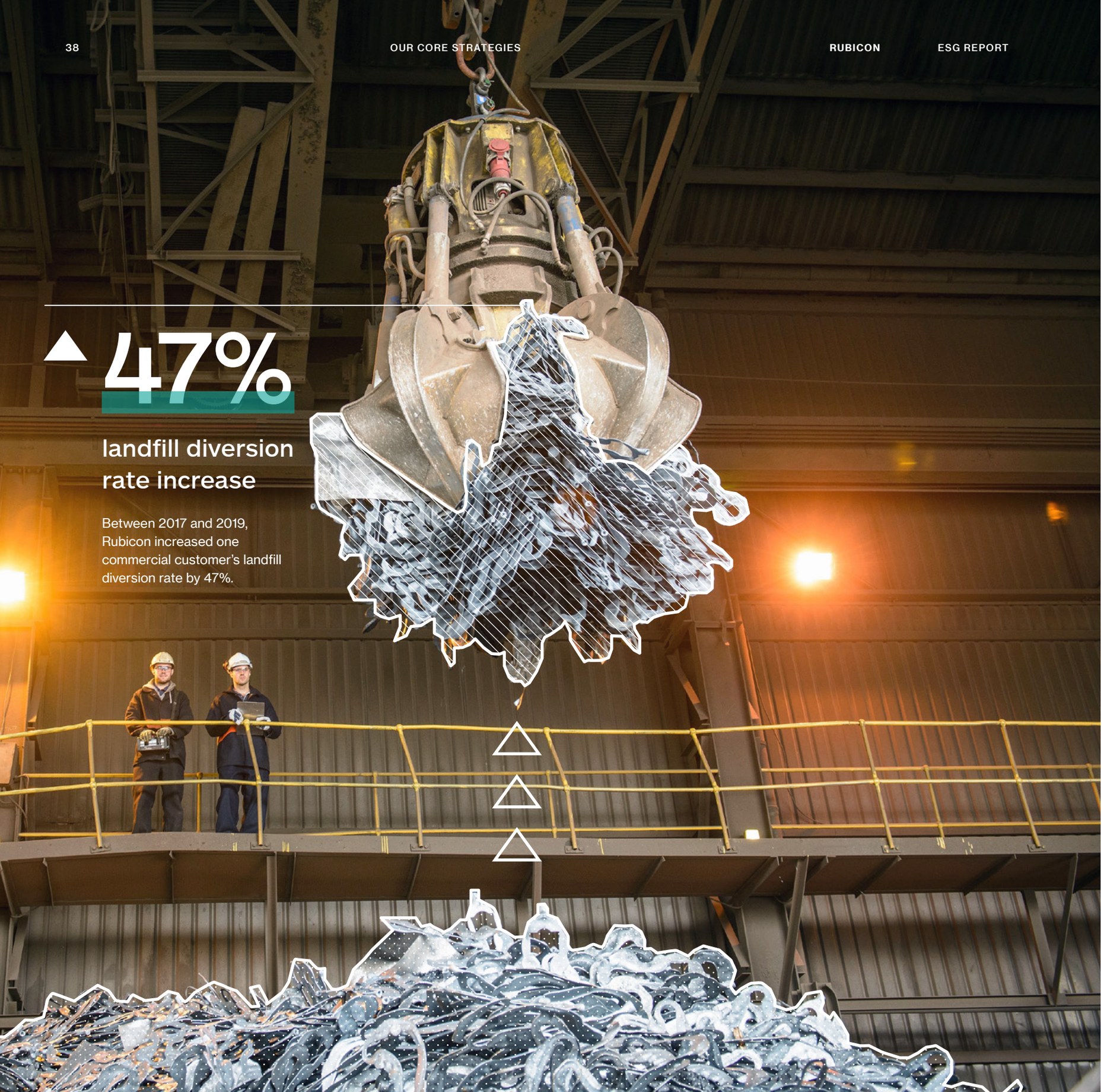
13 CLIMATE ACTION

14 LIFE BELOW WATER

15 LIFE ON LAND

16 PEACE, JUSTICE AND STRONG INSTITUTIONS

17 PARTNER-SHIPS FOR THE GOALS



▲ 47%

landfill diversion rate increase

Between 2017 and 2019, Rubicon increased one commercial customer's landfill diversion rate by 47%.

Making Waste Reduction Pay

In a circular economy, incentives must exist to promote desired outcomes.

In a linear economy, there are little to no incentives to recycle or reduce waste; the result is plain to see. So in 2019, we created a system for our own employees so they would have every incentive to help our customers and clients achieve waste reduction goals. We anchored a portion of their annual bonuses to the amount of waste reduced across all of our company's clients. We set an initial goal for the percent change in waste diversion over the prior year, and throughout the year we updated our team on our progress in meeting that goal. This performance metric demonstrates to our customers and our stakeholders that our success depends on the core environmental objective that matters most: ending waste.

We have also included diversion incentives in contracts with certain major commercial customers. Our compensation from these contracts depends on how much we help them divert waste from landfills. One such customer adopted a comprehensive recycling program that includes composting, metal and wood recycling, and specialized recycling for hard-to-recycle streams. Between January 2017 and July 2019, we increased their landfill diversion rate by 47%.

Participating in Anti-Waste Coalitions

Plastics and packaging waste are primary contributors to the problem of waste.

In 2018, Rubicon was among the first 250 companies, organizations, governments and universities worldwide, and the only North America-headquartered waste and recycling company, to sign the Ellen MacArthur Foundation's New Plastics Economy Global Commitment, a charter designed with the purpose of ending plastic pollution. Rubicon is committed to increasing the volume of recycled plastics serviced for its customers by 15% annually by 2025. In signing on to the New Plastics pledge, we are part of a coalition that collectively aims to:

01

ELIMINATE problematic, unnecessary, and single-use packaging

02

INNOVATE to ensure that all plastic packaging can be safely reused, recycled, or composted

03

CIRCULATE the plastics produced by increasing the amounts that are reused or recycled[34]

Global Expansion

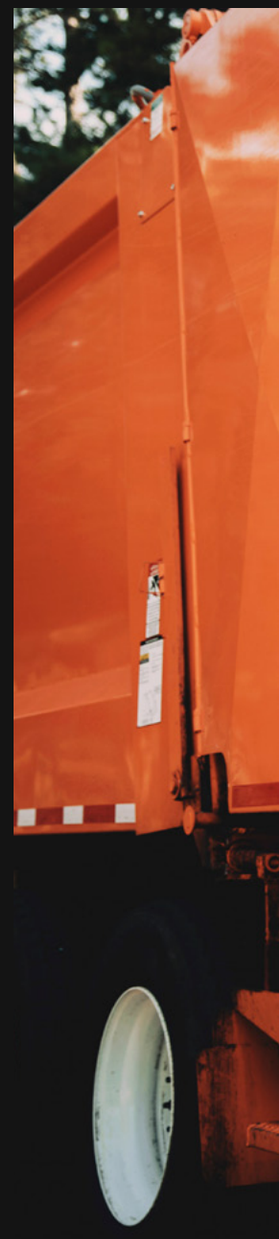
Rubicon set out in early 2019 to deploy its technology beyond North America.

We know the problem of waste does not end at the border, so we built key partnerships with some of the most sophisticated environmental companies in Europe, Asia, and Central America. These companies have access to Rubicon's platform of both in-vehicle and fleet management dashboard technology in order to help uncover cost savings, divert waste, and improve operations through data analytics.

Rubicon is committed to increasing the volume of recycled plastics serviced for its customers by 15% annually by 2025.

05

Our Platforms at Work



Our Platforms at Work

If there's anything that characterizes our problematic relationship with waste, it's the landfill. Frequently located on the outskirts of our largest cities, and filled with items we would rather forget, they are the perfect emblems of our out-of-sight, out-of-mind attitude about waste.

If we are to move toward more responsible and sustainable management of waste, the first step is to make sure that we are fully aware of our waste—its composition, its flows, its scale, its impacts and its costs.

The old expression applies: we can't manage what we don't measure. Before Rubicon, there were limited efforts to create a truly systemic understanding of waste. Waste is a decentralized business—there are over 20,000 hauling companies in the United States alone, and countless waste streams.[35] Most businesses have at least two waste services: landfill and mixed recycling, and due to the wide variation in rules determining which facility takes which materials, it can be challenging for organizations to understand and manage their own waste problem.

That's why our approach—rooted in technology, data gathering and analysis, and digital tools—is essential. We help make waste truly visible and manageable for the first time.

Here are some of our primary platforms:

RUBICONPro

RUBICONPro™ is an "Internet of Things" solution that provides our commercial haulers with a wealth of tools and capabilities to help them efficiently manage their business.

The RUBICONPro platform features three devices that are installed within the hauler vehicle. RUBICONX™ is an interactive app that gives drivers navigation capabilities while allowing them to flag items that might affect service, like overflowing or missing bins, and locked or blocked gates. Dispatch operators are also able to communicate immediately with drivers, sending updates, such as adding a new service location to a driver's route. RUBICONY™, a plug-in dongle that connects to the vehicles' diagnostic port, monitors vehicle and driver behavior, vehicle health, and service behaviors. The data gathered through both RUBICONX and RUBICONY allow us to be proactive with our customers, alerting them when service does or does not happen, and letting them know why. Finally, our camera-based computer vision platform is starting to allow us to gather information without any manual input from drivers, collecting data points as the truck drives along its route.

Rubicon provides this technology to our commercial haulers in order to gain additional data and insights into what's happening on the ground. Arming haulers with our technology allows Rubicon to read deeper into the operations of our customers, and in turn provide better service and more strategic solutions.

RUBICONConnect

Data collection is the first step in making waste visible, but what Rubicon's customers really need are actionable insights.

RUBICONConnect™ gives our commercial customers a platform to understand their waste in greater detail. It allows customers to dissect data, breaking down waste generation by location and stream, so they can see how much waste there is, where it's created, and how it's currently being handled. For companies with a significant operational footprint, consolidating this information into a single data stream allows for quicker identification of opportunities for waste reduction and recycling. It can also promote greater compliance with company or regulatory environmental performance objectives. RUBICONConnect allows managers to view waste diversion performance over time, on a site-by-site and company-wide basis. And to help make waste diversion even more valuable and visible to our clients, in 2017, we partnered with Trucost, part of S&P Global, a leader in carbon and environmental data and risk analysis, to verify the methodology Rubicon employs to determine landfill diversion rate and how much carbon our clients avoid emitting by choosing non-landfill solutions. Trucost validated the methodology again in early 2020. We've been developing additional functionalities, from industry benchmarks that allow customers to see how they are performing against peers, to tools that allow sustainability managers to see how they can get the most appropriately sized waste container for their needs. Our aim is to provide our customers with the resources they need to build the waste reduction program that works best for them and their goals.

We believe the power of data is critical in helping customers understand their waste challenge, allowing them to take specific actions to control, reduce, and eventually eliminate it.

RUBICONPremier

Rubicon recognized that our model of connecting haulers and their customers could be helpful to other countries and international businesses as they tackle their own missions to end waste. We developed RUBICONPremier™ as a cloud-based solution that integrates customers, haulers, and waste operations into a full suite platform.

One such partnership is in Japan with Odakyu Group, a group of companies in the transportation, real estate and retail industries. We are working with the conglomerate on a program to advance circular practices within the country's waste and recycling industry. As part of this collaboration, Odakyu is using RUBICONPremier on a number of different initiatives to help Japanese haulers improve operational efficiency. Working with the City of Zama, Odakyu will look to improve the efficiency in the dispatch centers with real-time monitoring of hauling. Dedicated smartphones in the hauling trucks will allow the centers to see the location of the hauler vehicles and how much they've collected. Odakyu will also perform infrastructure checks through the use of the smartphones in the hauling vehicles, which will help prevent illegal dumping and contamination, and will eventually lead to better management of infrastructure such as roads and lights. Lastly, the City of Zama and Odakyu will test the possibility of informing citizens on the location of hauling vehicles in real-time. Through this partnership, Rubicon is helping Odakyu and the City of Zama develop new business opportunities while creating a more sustainable ecosystem and a circular economy.

We believe the power of data is critical in helping customers understand their waste challenge.

06

Bringing it Together: RUBICONSmartCity

Bringing it Together: RUBICONSmartCity

Cities are at the frontlines in the war on waste. By 2025, the world's urban areas will be producing 2.2 billion tons of waste per year.[36] By 2050, nearly 70% of the world's residents will live in urban areas.[37]

That means major demands on infrastructure, not to mention the natural environment. Cities need more efficient and circular practices to meet these demands—and we are ready to put our technology to use to meet this challenge. That begins with our work outfitting the cities of the future with sanitation and recycling systems that are responsive in real-time and enabled with smart technologies.

The term "smart city" has become synonymous with visions of an urban environment redesigned and reimagined with a vast network of interconnected systems of roads embedded with traffic sensors to reduce jams, power grids that both feed electric vehicles and are fed by the portable batteries of those same vehicles when not in use, and systems to track public health indicators in real-time.

Rubicon's vision of a smart city includes advanced technology to deliver city services proactively, rather than reactively. Every mayor is judged on delivering basic necessities to citizens, like safe, clean streets and getting the trash picked up on time. Yet most cities are always behind, caught in an endless loop of reacting to citizen complaints instead of proactively addressing broader quality of life concerns. At Rubicon, we see a better way.

We've customized our RUBICONPro product to create a data collection platform for municipal governments and city leaders to better understand their operations. RUBICONSmartCity™ turns city-owned sanitation and recycling fleets into roaming data collection centers, enabling municipal solid waste fleets to collect valuable data to improve operations and monitor city conditions.

HIDDEN IN PLAIN SIGHT

Cities are hotbeds of data about everything from energy use to the flow of people, goods, and services. But for the most part, that data is hidden—and therefore unmeasurable and unusable.

The RUBICONSmartCity technology suite consists of the following: RUBICONX, the in-cab interface, and RUBICONY, the small device that plugs into the diagnostic port within the vehicle. Together, these technologies collect thousands of data points that are transmitted in near real-time back to a web-based manager portal, generating insights and potential improvements.

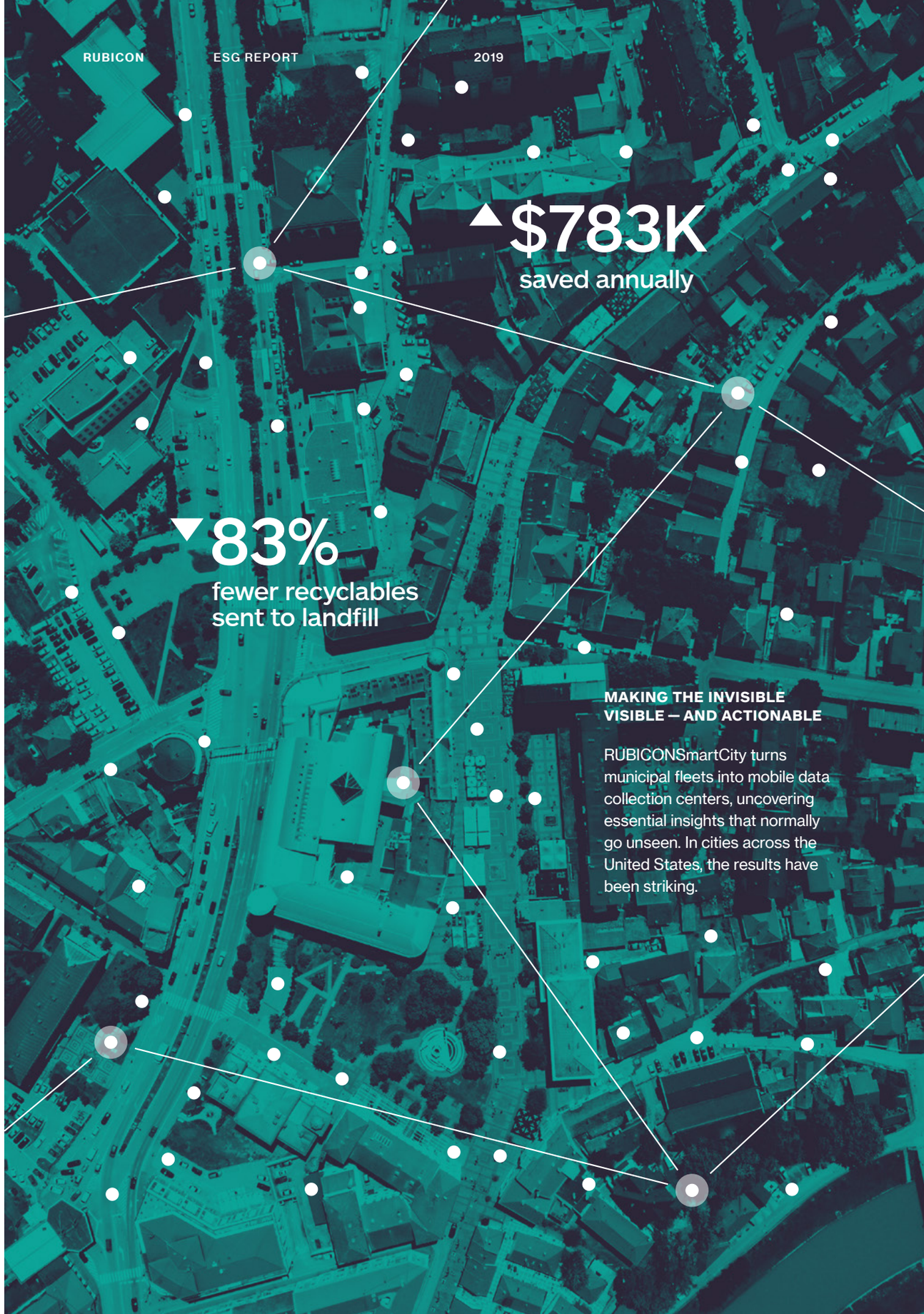
Municipal drivers use the RUBICONSmartCity suite as they drive their routes. The technology tracks data points such as vehicle location, route completion, and service confirmations for waste and recycling vehicles without the need for radio-frequency identification devices (RFID).

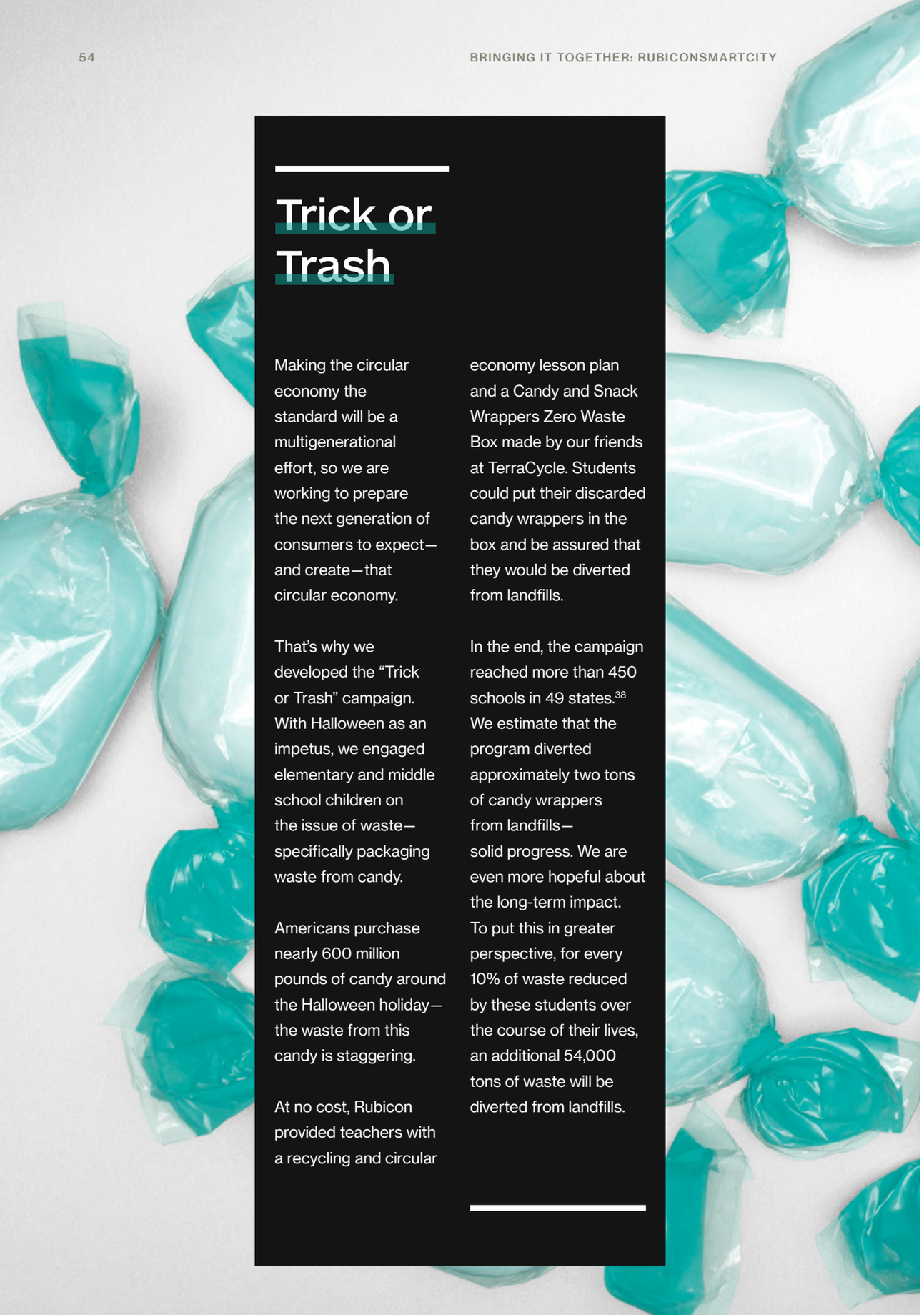
Additionally, the technology enables drivers to complete a fully electronic pre- and post-trip inspection for every trip they make. The technology also empowers drivers to relay issues along a given route, simply by tapping a button on the in-cab interface's app. The list of potential issues includes blocked or overflowing containers, contaminated recycling bins, and illegal bulk waste, among many other possibilities.

Once installed, RUBICONSmartCity also monitors key metrics related to truck condition and driving behavior, including tracking thousands of fault codes, as well as idle time, hard braking, speeding instances, and fuel consumption levels.

"When we hear the terms 'smart cities' and 'IoT' we often think of some futuristic state of existence—one that looks and feels very different, where hyper-digitization has eradicated the inefficiencies of analog life. In reality, the future will look and feel much more like the present, with technology running our world invisibly, in the background. Companies like Rubicon are giving us a taste of this future—using advancements in data collection to deliver transformational change to cities, but without dramatic disruptions to our everyday way of life."

— DR. MICHAEL FERRARI
Managing Partner at Atlas Research Innovations, Senior Fellow at The Wharton School





Trick or Trash

Making the circular economy the standard will be a multigenerational effort, so we are working to prepare the next generation of consumers to expect—and create—that circular economy.

That's why we developed the "Trick or Trash" campaign. With Halloween as an impetus, we engaged elementary and middle school children on the issue of waste—specifically packaging waste from candy.

Americans purchase nearly 600 million pounds of candy around the Halloween holiday—the waste from this candy is staggering.

At no cost, Rubicon provided teachers with a recycling and circular economy lesson plan and a Candy and Snack Wrappers Zero Waste Box made by our friends at TerraCycle. Students could put their discarded candy wrappers in the box and be assured that they would be diverted from landfills.

In the end, the campaign reached more than 450 schools in 49 states.[38] We estimate that the program diverted approximately two tons of candy wrappers from landfills—solid progress. We are even more hopeful about the long-term impact. To put this in greater perspective, for every 10% of waste reduced by these students over the course of their lives, an additional 54,000 tons of waste will be diverted from landfills.

The data and insights collected by RUBICONSmartCity translate into direct savings for cities. In Atlanta, Georgia, our software platform identified an opportunity to save the city and its taxpayers money while speeding up their efforts to achieve waste reduction goals. By adjusting the city's solid waste service schedule from four to five days, decreasing the total amount of trash routes per day, and balancing the number of hours driven among drivers, RUBICONSmartCity helped the city save up to $783,453 annually, while reducing the amount of recyclables going to landfill by 83%.

Prior to working with Rubicon, the City of Spokane, Washington, relied on paper route sheets to instruct drivers which stops to pick up on a daily basis. Drivers were also using paper and pencil to log exceptions at the curb. Upon the implementation of our technology, the digitization of the solid waste routes and exception reporting saved the City $9,750 in printing costs alone.

In Norfolk, Virginia, our software supported the city's efforts to reduce missed garbage collections. After implementing our software in June 2019, Norfolk saw a 58% reduction in citizen calls relating to missed garbage collection compared to the prior year.[39] This reduction translates into cost savings of up to $17,000 dollars per year, solely in 311 operator cost reductions.

In Montgomery, Alabama, the city was awarded the 2019 Government Innovation Award, a national award celebrating government IT's disruptors, innovators, and emerging leaders.[40] The award recognizes the city's innovative use of technology and collaboration with Rubicon to streamline sanitation management and vehicle maintenance, thereby driving efficiency, cost savings, and improved service.

Since 2017, we have expanded the reach of our software to over 45 cities across the United States and around the world. As part of our B Corp commitment, we charge nothing to cities who want access to our software as part of a pilot partnership program.

We also continue to innovate, pushing the boundaries of technology to make it even easier for cities to realize cost savings, improve customer service, and divert more waste from landfills.

For example, we've deployed photo recognition technology, which is a camera-based system that uses computer vision and machine learning technology to gather data automatically. This technology uses cameras mounted on fleet vehicles to help city officials better see what is happening on their streets, identifying issues such as poor road conditions, overflowing bins or, in the case of Fort Collins, Colorado, parked cars and other obstacles that impede street sweeping.

We have put the machine learning models to work elsewhere. For instance, we are training our technology to recognize recycling containers at the curbside, which will help city managers better understand who is and who is not participating in recycling programs, all without the touch of a button or the need for additional auditing resources. The goal is to help city officials develop targeted programs to promote recycling in those areas.

RUBICONView

Cities need tools to measure recycling and track it in real time. One of those tools is RUBICONView™, a recycling audit application that helped Atlanta, Georgia reduce contaminated recycling at the source.

Contaminants like plastic bags and hoses in household recycling bins can kill a recycling program. Municipal recycling facilities that find these un-recyclable materials in a load of recycling may automatically declare the entire load "contaminated" and consign it to the landfill, costing the city thousands of dollars per load. That's why municipalities need to audit household recycling streams.

RUBICONView streamlines these recycling audits on a large scale. The smartphone app enables auditors to capture the location and origin of each load, take images of the material, and document occurrences of contamination. That information then automatically uploads to Rubicon's cloud-based portal for analysis—providing a clearer view of contamination by individual recyclers and communities.

We estimate that our RUBICONSmartCity technology has the potential to save U.S. cities up to $208 million dollars over the next 10 years through reduced disposal costs, optimized fleets, and other metrics.*

**Based on assessment of RUBICONSmartCity savings conducted by 10EQS Consulting Services*

City Savings

Municipalities spend a lot to tackle their solid waste problem.

New York City's Department of Sanitation (DSNY), the largest municipal solid waste agency in the world, has an annual budget of $1.5 billion. Given the scale of these expenses, cities are constantly searching for ways to improve their waste management practices in terms of efficiency and customer service, while remaining good stewards of taxpayer dollars.

Our RUBICONSmartCity technology platform has been developed to help cities operate their solid waste fleets more effectively, with demonstrated success helping cities like Atlanta optimize routes and improve recycling rates.

We estimate that our RUBICONSmartCity technology has the potential to save U.S. cities up to $208 million dollars over the next 10 years through reduced disposal costs, optimized fleets, and other metrics.* These newfound funds may be redeployed to a variety of beneficial areas, including programs that increase recycling rates and participation.

Recharging recycling: How Rubicon helped Atlanta recycle better

83%
reduction in recyclables headed to landfills

27%
increase in overall capture of quality recyclables

57%
reduction in overall recycling contamination

70%
total recycling participation rate over seven weeks

Helping Households

In 2017, we launched RUBICONView in Atlanta.

The initiative had several goals, including collecting better data on contamination of recycling loads, and educating households on how to keep recycling from getting contaminated in the first place.

The seven-week campaign covered four neighborhoods. Rubicon and The Recycling Partnership, a national nonprofit dedicated to improving domestic recycling, conducted a "Feet on the Street" campaign to track recycling habits. The campaign revealed common recycling mistakes, such as mixing food waste into recyclables, bagging recyclables instead of leaving them loose in bins, or putting plastic bags in with recyclables. In fact, 85% of contamination issues arose from plastic bags found in the recycling stream.

In response to these findings, the team placed "Oops" tags on contaminated loads. These tags, followed by official letters from the City of Atlanta, remind residents about the best way to separate their recycling from other waste, and how to fill their bins properly.[41]

Scalable Solutions

Atlanta's results offer a preview of what's possible with digital tools. RUBICONView can empower cities to reduce contamination and help create the stream of recyclables essential to a circular economy.

We have to broaden these efforts. Multiple studies have documented the importance of community engagement in successful recycling programs, though municipalities struggle to establish such engagement.[42] According to the EPA, as of 2017, the U.S. municipal recycling rate was 35%, with cities generating 67 million tons of recyclables per year.[43] But with an average contamination rate of 25%, municipal recycling programs are sending about 22 million tons of recyclables to landfills each year.[44] This represents a massive opportunity for improvement.

By accelerating data collection and creating better ways to share feedback with community stakeholders, RUBICONView can help other cities reduce contamination—just like Atlanta did.

07

Building Scale Through Businesses

Building Scale Through Businesses

Building a circular economy is a complex project that entails significant financial, operational, and cultural commitments from a variety of stakeholders. Large corporations must commit to redesign their supply chains and products to facilitate easy recovery and reuse; significant public and private sector investments must be made to advance recycling infrastructure; greater public awareness is needed to improve recycling participation; innovators are needed to build new products that harness circular thinking.

In 2019, we saw some meaningful first steps taken by corporations and investors. Asset management giant BlackRock launched the first circular economy-focused fund. Multi-national consumer products goods companies are attempting to reduce their use of virgin plastic in single-use packaging.[45] At Rubicon, we are following this progress and encouraging others to join this movement. The first significant step along this journey is developing a formal plan to minimize waste.

Foodservice, logistics, and retail are vastly different industries with unique customers, business models, and regulations. But these businesses all produce waste, and using our experience, we are trying to help all companies adopt circular practices, regardless of their size or industry.

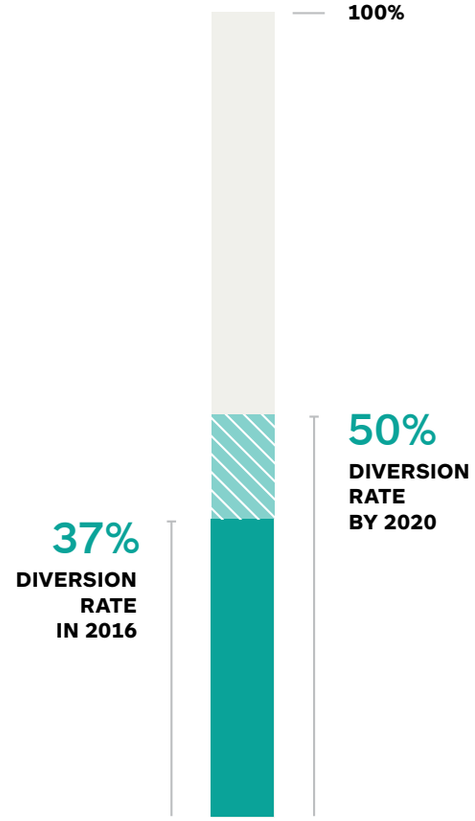
It starts with a simple approach: we see value in all materials, and we are working with a variety of clients to help them capture that value.

Chipotle

Fast-casual restaurant chain Chipotle serves more than 1 million customers per day. Single-use gloves are a necessity for the business. In fact, about nine percent of the company's total waste consists of plastic wrap and gloves. Previously, 95 percent of those gloves ended up in landfills, so the company was eager to find ways to address this waste issue.

By teaming up with Chipotle, we found a solution with an Arkansas-based startup specializing in plastics recycling. Together, a process was developed to convert the sterile polyethylene gloves used in Chipotle's kitchen and food lines into PCRPro, a high-quality resin used to manufacture garbage can liners.

Joining forces, a mail-back pilot program began at 25 Chipotle locations. From April 2019 through December 2019, these restaurants recycled more than 625,000 gloves, with a plan to expand the program to all Chipotle locations. The company aims to divert 50 percent of its waste from landfills by 2020, compared to its 37 percent diversion rate at the end of 2016. Early results of the "Gloves to Bags" program show how reducing restaurant waste is one way foodservice can contribute to the circular economy. Most recently, the program even received a Shorty Social Good Award, which recognizes brands using communications, social and digital media to "positively impact people all over the world."[46]

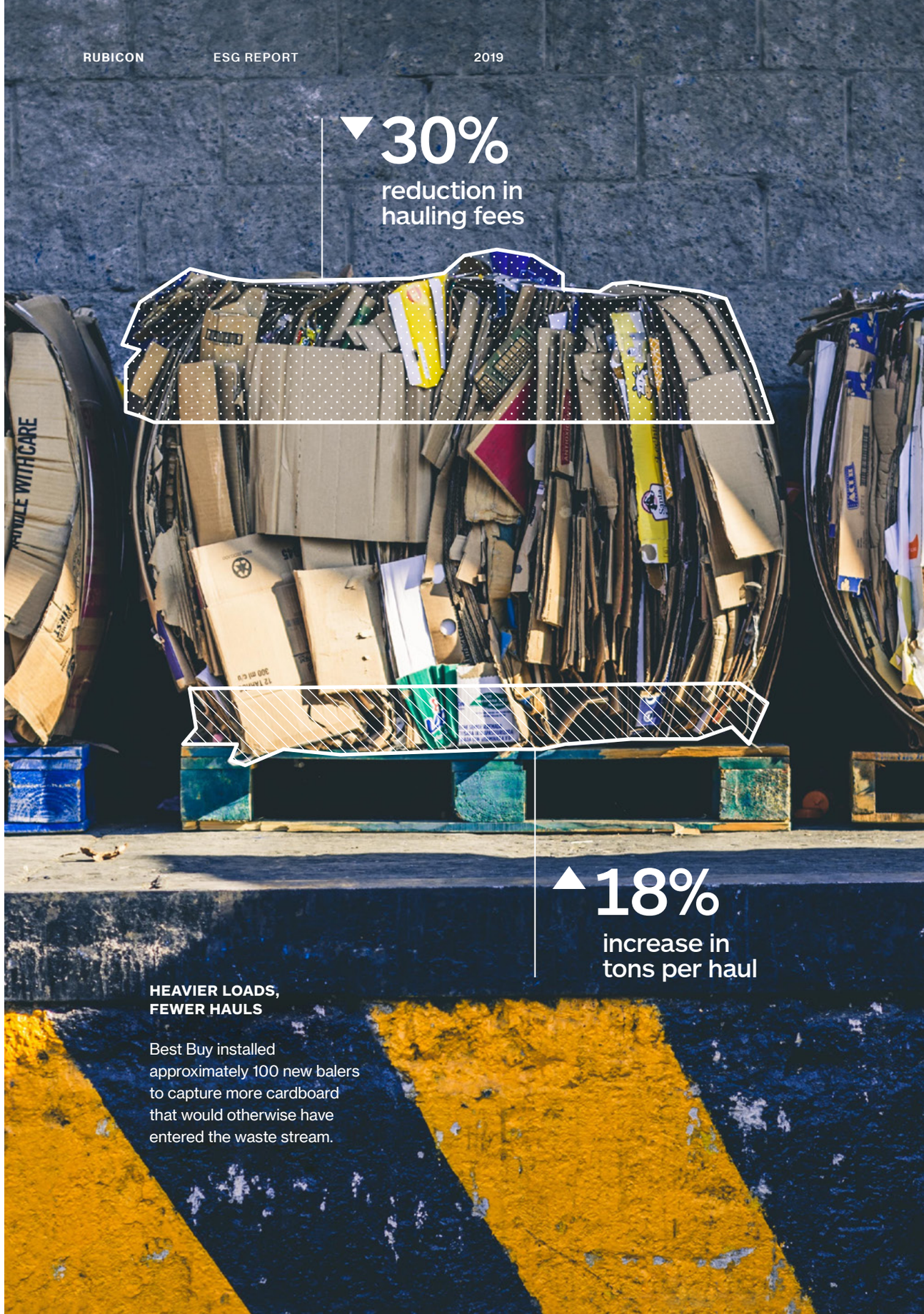


Best Buy

Best Buy's commitment to sustainability is well known. In 2019, Barron's named them the most sustainable company in the United States.[47] Despite China's 2018 ban on most foreign recyclables, a challenging time for the world of recycling, Best Buy contracted Rubicon to support and expand the company's existing waste reduction programs. Our efforts have helped the retailer save on hauling, boost diversion rates, and create more sustainable waste and recycling practices. As a result, Best Buy has moved closer to a zero-waste reality.

One key change we introduced at Best Buy helped the company reduce hauling costs. We tested the program in the Denver market: by helping retail staff monitor waste compactors more carefully, we were able to ensure that pickups were only scheduled when the compactors were actually full. In the first quarter of 2019, compared to the prior year, we helped the Denver market reduce hauling fees by 30%, while increasing tons per haul by 18%. In other words, heavier loads and fewer hauls.

Amid lower commodity prices, and as end-market quality requirements rose, we also helped Best Buy regional distribution center staff learn how to spot contamination in recycling loads. With our encouragement, Best Buy installed approximately 100 new balers to capture additional amounts of cardboard that would otherwise have gone into the waste stream. In another key effort, we initiated a pilot project for a sustainable materials management plan for one of the company's Reverse Logistics Centers. Best Buy has also introduced automation technology in some of their Distribution Centers. These next-generation facilities include robots that sort items, and we are working with Best Buy to ensure that the facilities follow best practices on materials and waste management.



THE MASSIVE PROBLEM OF FOOD WASTE

In the United States alone, food waste is estimated to comprise at least 30% of the total food supply.

Wegmans Food Markets

Food waste is a massive problem. The U.S. government estimates that food waste makes up 30 to 40% of the food supply.[48] It's not surprising, then, that setting zero waste targets in a grocery setting calls for bold thinking and tough action—revisiting supply chains and establishing sustainable purchasing policies, accurately forecasting demand to minimize spoilage, and sustainably managing any waste generated in operations.

In 2016, Rubicon partnered with Wegmans to start their zero waste journey at the grocery chain's Canandaigua, NY store. The pilot was a success, increasing the recycling rate at this store from 66% in January 2016 to 83% in December 2016. With the success of the pilot, Wegmans decided to expand this program; now 61 Wegmans stores are on a journey to zero waste. The program aims to cut food waste in half by 2030.[49]

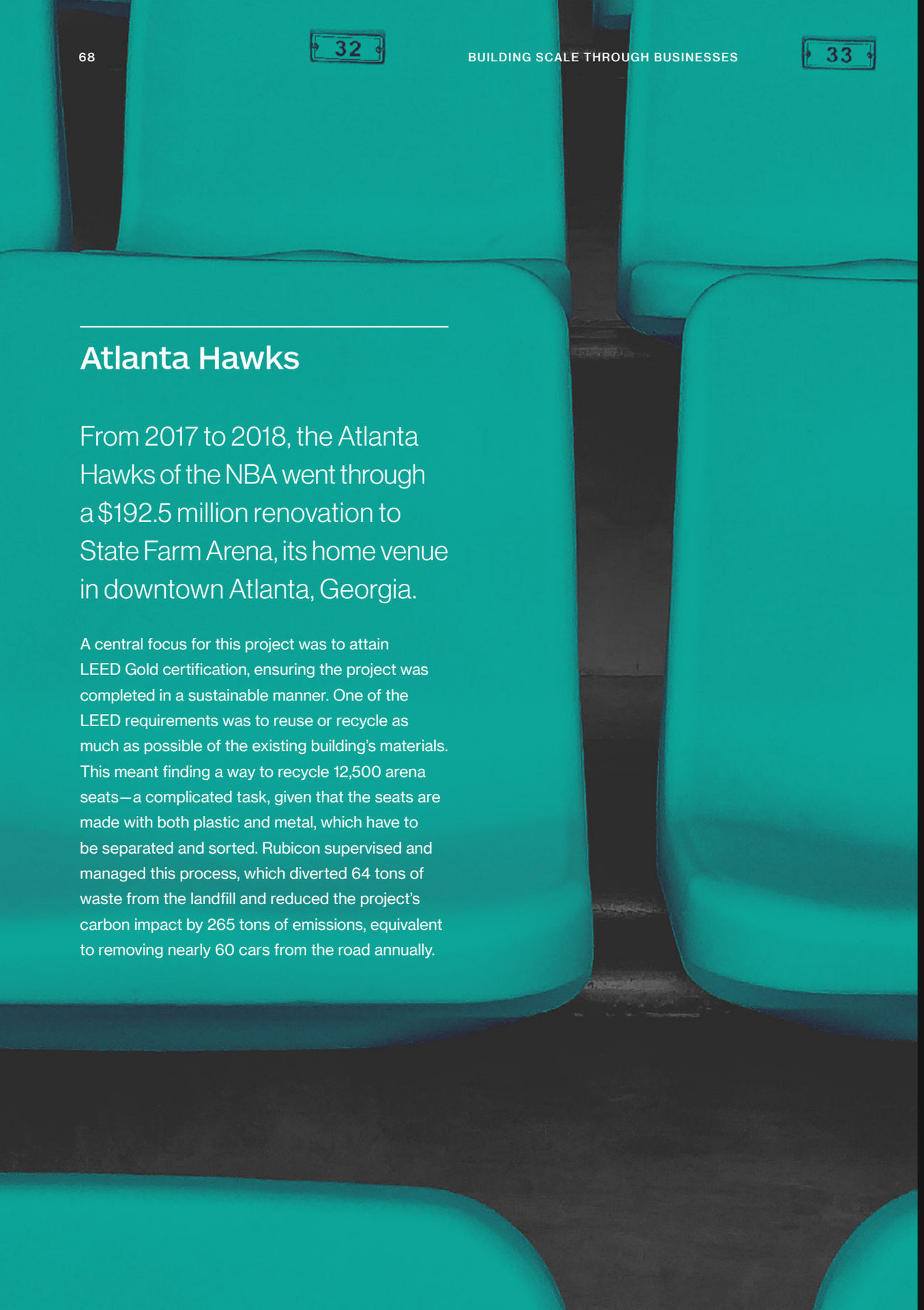
Throughout our partnership, we have worked with Wegmans to identify ways of repurposing, refurbishing, and recycling a variety of materials—including non-food products. For instance, we've recycled thousands of pounds of granite countertop, and found a second use for seafood containers and bakery racks. We also developed a program to recycle kitchen oil and grease, and to convert meat products into biofuels.

While each solution brings Wegmans closer to their recycling goals, we are particularly proud of the work we've done together to reduce food waste by establishing an organics recycling program for almost all Wegmans locations, including the chain's restaurants, multiple distribution centers, and non-retail support buildings.

The food scrap recycling partnership has been successful. Between September 2018 and September 2019, for instance, Wegmans diverted approximately 30,000 tons of food scraps to compost or anaerobic digestion. Anaerobic digestion is the process in which bacteria break down organic matter without oxygen. Part of the material was eventually converted to biogas on a New York State dairy farm, creating enough electricity to power the equivalent of more than 300 homes.

The food scrap recycling program with Wegmans has also supported nine organics haulers and sixteen organics recycling facilities, strengthening the organics infrastructure across the Northeast. Rubicon has worked closely with New York-based organics recycler Natural Upcycling, using the partnership to improve the food waste recycling market in Maryland and New Jersey.

These examples demonstrate how we can reduce waste and support progress towards the circular economy by giving a second life to materials used in the ordinary course of business.



Atlanta Hawks

From 2017 to 2018, the Atlanta Hawks of the NBA went through a $192.5 million renovation to State Farm Arena, its home venue in downtown Atlanta, Georgia.

A central focus for this project was to attain LEED Gold certification, ensuring the project was completed in a sustainable manner. One of the LEED requirements was to reuse or recycle as much as possible of the existing building's materials. This meant finding a way to recycle 12,500 arena seats—a complicated task, given that the seats are made with both plastic and metal, which have to be separated and sorted. Rubicon supervised and managed this process, which diverted 64 tons of waste from the landfill and reduced the project's carbon impact by 265 tons of emissions, equivalent to removing nearly 60 cars from the road annually.

Going for the Gold: How Rubicon helped the Atlanta Hawks optimize their path to LEED certification.

$192.5M
renovation focused on achieving LEED Gold certification

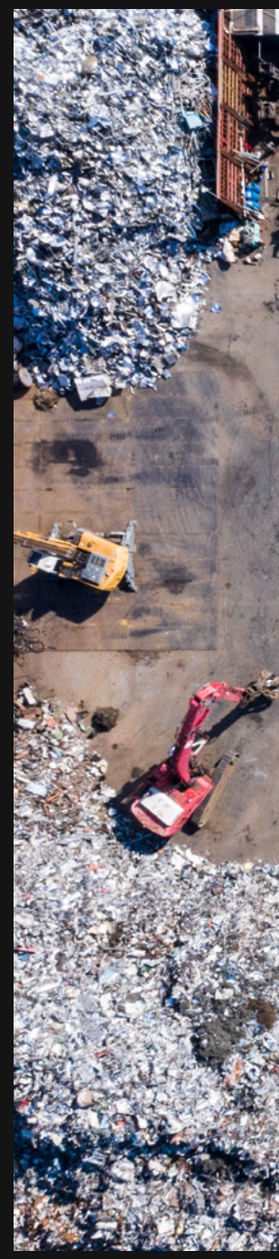
12.5K
arena seats recycled

265 tons
reduction in potential emissions from the project

64 tons
of waste diverted from landfills

03

The Built Environment



The Built Environment

It's impossible to have a serious discussion about a circular future without addressing the built environment—our cities, roadways, buildings, walkways, parks and other fixed infrastructure. These are major sources of waste—in the United States alone, the EPA estimates that approximately 530 million tons of construction and demolition waste is generated annually. That's more than all municipal waste generated by all U.S. cities combined. Of this, it is estimated that between 30–70% is sent to landfills.[50]

We can't expect this pace of growth—and waste creation—to let up. By 2060, current projections estimate that globally society will build the equivalent of the City of Paris each week.[51] The only way to reconcile growth and environmental health is through widespread adoption of circular practices.

At Rubicon, we look forward to solving this problem. It is our hope that the increased focus on green building standards will result in greater attention to sustainable management of construction materials. But more needs to be done.

In the absence of uniform regulations or other efforts, we're moving forward. Here are some examples of our efforts:

Going for 90% Diversion

In 2019, Rubicon worked with a global construction firm on an audacious goal: diverting at least 90% of waste generated from a large-scale project. We looked at every opportunity to keep waste out of landfills—even food waste from the construction crews themselves, setting up separate bins and other composting infrastructure. At the conclusion, the project achieved a 97% diversion rate—far surpassing the baseline for industry recognition and certification.

THE PROJECT ACHIEVED A

97%

DIVERSION RATE

DAVACO

One of the toughest challenges in achieving zero waste is finding solutions for hard-to-recycle materials. This is especially true when materials are in small quantities across a large number of geographically diverse locations. There are logistical challenges, certificates of destruction to obtain, and intellectual property concerns when handling client material. Our work with DAVACO, a leader in high-volume remodels for retail, hospitality, and healthcare, shows it's possible to deliver an end-to-end sustainability solution that finds new life for discarded materials.

As part of this project, we helped DAVACO on a metal recycling project for Starbucks. DAVACO field reps collected fixtures from more than 6,700 stores. Then, working with third-party scrap metal partner Becker Iron & Metal, Rubicon directed DAVACO's logistics fleet to transport the fixtures to more than 250 recycling locations—unloading the material and getting certificates of destruction for each load.

As a result of this project, we were able to keep 161 tons of metal—the equivalent of nearly 18,000 bicycles—out of landfills and divert the material into recycling streams. Equally as impactful, rebates returned from the fixtures were donated to non-profit organizations that support veterans, including The Mission Continues, USO, Team RWB, and Blue Star Families.

Putting Waste to Work: Composting

Putting Waste to Work: Composting

Landfills are the third-largest industrial emitter of methane, a greenhouse gas 30 times more potent than the carbon that comes out of passenger vehicles.[52] And since food and other organic waste accounts for 46% of solid waste generated every year,[53] food waste alone represents 8% of total global greenhouse gas emissions. If food waste were a country, it would be the third largest contributor to global warming.[54]

A key solution to these challenges is composting, a process that can go a long way in reducing both emissions associated with food and other organic waste, as well as reducing overall waste. Research has proven that composting emits less methane than landfilling.

However, globally only 13% of urban food waste is composted. Research conducted for Project Drawdown explains that if low-income nations were to compost food waste at the United States' current rate of 37%, and developed nations were to compost food waste at Europe's current rate of 57%, the globe could avoid methane emissions from landfills equivalent to 2.3 gigatons of carbon dioxide by 2050[55]—equivalent to 6% of global annual emissions.[56] And this number doesn't include the emissions reductions benefits from applying compost to soil, which would allow farmers to be less dependent on fertilizer to revitalize their soil.[57]

Armed with the understanding of composting's environmental and social impact, between 2018 and 2019 we increased the number of customers with organics services by 53%, while increasing our organics tonnage by 46%. We've also built one of the largest network of organics haulers and processors in the country.

Our focus is on helping to develop small organics businesses in areas without composting infrastructure. In 2018, Rubicon sponsored the U.S. Composting Council's Emerging Composter Award.

With our support, New York City-based micro-hauler Common Ground Compost purchased their first electric cargo trike, allowing them to collect organic waste without the emissions associated with traditional collection, and divert a significant portion of organic waste away from landfills.

In Virginia, Rubicon partnered with Natural Organic Process Enterprises (NOPE), a family-owned organics recycler and fellow B Corp focused on reducing and reusing food waste in Richmond. Our relationship with NOPE has helped us better serve Wegmans Food Markets, which had been searching for an organics provider that could help them move their Richmond locations towards zero waste. Today, Wegmans' Richmond locations divert over 20 tons of organic waste a month away from landfills. At the same time, we are helping NOPE to serve the growing organics recycling needs of the Richmond community.

Sweetgreen

When Sweetgreen was launched in 2007, its founders' goal was to revolutionize fast food and meet customer expectations for healthy and tasty locally sourced foods. Twelve years and 97 locations later, they clearly have realized that vision.

The company has also taken a forward-thinking approach to food waste. They reached out to Rubicon to help them find ways to recycle as much of their own unused food as possible.

According to ReFed, U.S. restaurants waste 11.4 million tons of food each year valued at $25 billion.[58]

We worked with Sweetgreen to integrate all 97 of their locations into an organics recycling program. This program works with customers of all sizes to establish safe, sanitary, and efficient organics storage and disposal programs with local organics companies such as Circle Compost in Philadelphia and Farm Dirt Compost in Houston.

National Variety Store Chain

In 2019, shortly before launching a line of perishable food products, a large national variety store chain approached Rubicon wanting to learn more about our organics recycling offerings. Up to that point, Rubicon had primarily worked with the customer on plastics, paper, and cardboard recycling. But the retailer understood that selling fresh food would present a different challenge.

Prior to launching their line of perishable food products, the discount chain had only been selling packaged food. Their distributors would drop-ship the food items to them and take away expired product. After launching, the company became responsible for doing something with their expired products, including expired milk—a special challenge.

The customer turned to Rubicon for help. Recycling expired milk involves significant cost, but the company's leaders were adamant that they would not allow the product to be poured down the drain. Working in partnership, Rubicon created a program in which the expired milk gets picked up by a Pennsylvania-based farm: Reinford Farms. This milk undergoes a process called anaerobic digestion, which breaks it down into two substances—biogas and digestate.

The biogas that comes from this process can generate electricity for Reinford Farms' full 1,300 acres, with enough energy to spare to sell back to the local electric company and power 500 homes.

Digestate is a nutrient-rich substance that can be applied to land as a natural fertilizer, improving yields and the ability of plants on that land to sequester carbon from the atmosphere. To date, we've sent 4,134 tons of milk to Reinford Farms, avoiding 2,414 metric tons of carbon dioxide equivalent—comparable to the greenhouse gas emissions of 521 passenger vehicles driven for one year.[59]

The only long-term solution to our global waste crisis is to remake our linear economy into a circular one—

where industrialized nations substitute recycled materials for natural resources; where consumers and businesses use products longer, reduce waste, and recycle more; and where environmental damage is not the price we pay for prosperity and economic opportunity.

We continue to ignore the waste we produce at our own peril. Despite our best efforts to put it out of mind, our waste is *everywhere*—even inside us. Microplastic finds its way into virtually every living thing thanks to the runaway use of plastics around the world.[60]

Rubicon's mission is to end waste. We want to end the waste of raw materials, the waste of financial resources spent on landfills and trash burning, and the waste of human potential and human life due to pollution-related illnesses.

We have chosen to focus on where we can have the biggest impact in the fastest way possible.

We know, of course, that we cannot do this work alone. We are entirely dependent on consumers demanding more sustainable packaging, producers innovating further to reduce the waste associated with their goods, corporations setting ever higher standards for their own sustainability efforts, governments meeting their own obligations, and citizens across the globe becoming more active and energized to attack the problem of waste wherever they see it.

We will be there fighting, innovating, and executing—and we look forward to many years of progress.

In the years to come we expect to make major inroads on the following dimensions:

The Urban Landscape

We want to reduce waste and improve recycling in cities and urban areas by working with municipalities to better manage their trash and recycling infrastructure and by giving city leaders and citizens more tools to recycle effectively.

Igniting Environmental Innovation Through Technology

We will continue to develop technological tools like RUBICONView and RUBICONConnect to focus the power of scalable technologies on the global waste crisis. We have already proven the power of actionable data in raising recycling participation; we aim to build on this success.

Making the Business Case

We want to work at scale with businesses and organizations so they can achieve their own sustainability goals. We will create programs that align with their business and industry needs, delivering solutions through our own services, or connecting them to third-party providers. Our goal is to turn waste from a cost center to a value center—an essential step towards building a circular economy.

Reimagining the Waste Economy

Through our network of private haulers, we have already created a powerful counterweight to the status quo of the waste industry. Today, commercial clients are finally getting a choice in how they meet their waste removal and recycling needs. Our goal is to continue to disrupt the status quo and build a network of private haulers whose first priority is to reduce the amount of waste that goes to landfills.

We will be there fighting, innovating, and executing—

and we look forward to many years of progress.

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Neenah Environment® Papers,
enabling us to conserve:

– 0.559 tons of fresh (green) wood,
which is equivalent to 3.35 trees
– 260.0 gallons, which is enough water
for 0.19 clothes washers operated/year
– 1.41 million BTUs, which is enough
energy to power 1.68 residential
refrigerators operated/year
– 12.0 pounds of solid waste, which
would fill 0.00041 garbage trucks
– 1450.0 pounds of CO_2, which
is equivalent to 0.1312 cars/year

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