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TRANSIT COOPERATIVE RESEARCH PROGRAM

TCRP RESEARCH REPORT 222

Analysis of Green Bond Financing in the Public Transportation Industry

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2021

TRANSIT COOPERATIVE RESEARCH PROGRAM

The nation's growth and the need to meet mobility, environmental, and energy objectives place demands on public transit systems. Current systems, some of which are old and in need of upgrading, must expand service area, increase service frequency, and improve efficiency to serve these demands. Research is necessary to solve operating problems, adapt appropriate new technologies from other industries, and introduce innovations into the transit industry. The Transit Cooperative Research Program (TCRP) serves as one of the principal means by which the transit industry can develop innovative near-term solutions to meet demands placed on it.

The need for TCRP was originally identified in *TRB Special Report 213—Research for Public Transit: New Directions,* published in 1987 and based on a study sponsored by the Urban Mass Transportation Administration—now the Federal Transit Administration (FTA). A report by the American Public Transportation Association (APTA), *Transportation 2000,* also recognized the need for local, problem-solving research. TCRP, modeled after the successful National Cooperative Highway Research Program (NCHRP), undertakes research and other technical activities in response to the needs of transit service providers. The scope of TCRP includes various transit research fields including planning, service configuration, equipment, facilities, operations, human resources, maintenance, policy, and administrative practices.

TCRP was established under FTA sponsorship in July 1992. Proposed by the U.S. Department of Transportation, TCRP was authorized as part of the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA). On May 13, 1992, a memorandum agreement outlining TCRP operating procedures was executed by the three cooperating organizations: FTA; the National Academies of Sciences, Engineering, and Medicine, acting through the Transportation Research Board (TRB); and the Transit Development Corporation, Inc. (TDC), a nonprofit educational and research organization established by APTA. TDC is responsible for forming the independent governing board, designated as the TCRP Oversight and Project Selection (TOPS) Commission.

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TCRP provides a forum where transit agencies can cooperatively address common operational problems. TCRP results support and complement other ongoing transit research and training programs.

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FOREWORD

By Mariela Garcia-Colberg
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TCRP Research Report 222: Analysis of Green Bond Financing in the Public Transportation Industry provides public transit agencies with an introduction to green bonds and how they can be used to advance the sustainability goals of those agencies. The report uses case studies to provide public transit agencies with the context and knowledge needed to understand the complexity of green bond issuance. The target audiences are public transit systems of all sizes and their stakeholders, including policymakers, transit board members, elected officials, and public transit agency managers and financial officers who are seeking new opportunities to finance public transportation. The report will also be useful to financial and legal advisors, as well as individual investors.

The issuance of green bonds could be an important tool for transit systems. In times of financial uncertainties, green bonds can provide an extra source of revenue. Events in the year 2020, including a pandemic and racial and equity concerns, have altered many aspects of everyday life, including public transportation. This report recognizes that public transit agencies are struggling and that they have lost revenue. With a green bond issuance, a transit agency can generate positive environmental impacts, attract investors for transit projects, and generate financial benefits.

The objective of this research was to provide the public transportation industry with an examination of green bonds, including an analysis of the different frameworks, definitions, benefits, risks, and costs. The report identifies potential roles and benefits of green bonds in advancing sustainability goals of public transit agencies, describes the value and costs of green bonds when compared to traditional bonds or other financing mechanisms, and identifies and contrasts alternatives to green bonds to advance sustainability goals. TCRP Project J-11/Task 38, "Analysis of Green Bond Financing in the Public Transportation Industry," presents information and lessons learned from previous issuances of green bonds.

The report is organized into eight chapters; the initial chapters introduce green bonds and provide an overview of the green bond market and transit green bonds. Subsequent chapters explain the costs and risks of green bonds versus traditional bond financing, the benefits of green bonds, how green bonds advance sustainability goals of public transit agencies, and alternatives to green bonds. Chapters 6 and 7 provide agencies interested in issuing green bonds with practical steps to follow, and they highlight case studies and lessons learned. The appendix at the end of this report provides several valuable resources that public transit agencies can utilize to expand their understanding of sustainable finance and make informed decisions on how best to incorporate the available resources into their strategies going forward.

CONTENTS

ACRONYMS

Name	Definition
ABS	asset-backed securities
BART	Bay Area Rapid Transit (San Francisco Bay Area)
CBI	Climate Bonds Initiative
ECSD	Environmental Compliance & Sustainability Department
EIB	environmental impact bond
ESG	environmental, social, and governance
GBP	Green Bond Principles (International Capital Market Association)
GHG	greenhouse gas
IATA	International Air Transport Association
ICMA	International Capital Market Association
LA Metro	Los Angeles County Metropolitan Transportation Authority
MBTA	Massachusetts Bay Transportation Authority (Boston)
MTA	Metropolitan Transportation Authority (New York)
S&P	Standard & Poor's Financial Services
SDG	Sustainable Development Goals (United Nations)

SUMMARY

Analysis of Green Bond Financing in the Public Transportation Industry

Green bonds have emerged in recent years as a compelling means of leveraging finance to advance global sustainability goals. For issuers, these instruments are designed to capture the value of initiatives that have positive environmental impacts. For fund managers, green bonds provide a means of identifying initiatives with the environmental impacts that their investors are increasingly demanding while offering a more attractive risk profile due to the active management of environmental, social, and governance issues.

At the most basic level, green bonds are identical to traditional bonds with additional nonfinancial disclosures attached to satisfy the core components of the 2018 International Capital Market Association's (ICMA's) Green Bond Principles (GBP), namely:

1. Use of Proceeds
2. Process for Project Evaluation and Selection
3. Management of Proceeds
4. Reporting

Though green bonds (as an instrument) are explicitly defined, there is less clarity surrounding what types of projects should qualify for the issuance of green bonds. Research for this report found that transit agencies are in a uniquely advantageous position for green bond issuance because most transit projects have an inherently positive impact on the environment (i.e., reducing carbon emissions by removing private vehicles from the road). This inherent alignment with sustainability goals, combined with widespread familiarity of public transportation as an asset class and the large size of typical transit bond issuances, make for a rather attractive investment opportunity.

Costs for issuing a green bond are variable but tend to be relatively low given the typical size of a transit bond issuance. An agency's first green bond issuance requires some additional one-time expenditures to lay forth an organization's sustainability goals and strategy, as well as to develop or identify an existing green bond framework to organize its offering. After the initial cost of developing organizational capacity to issue green bonds, the practitioners interviewed for this research indicated that preparing the required disclosures to issue green bonds costs about $10,000 in staff time. Should an issuer elect to hire a third-party verifier (an external party that confirms the green benefits of a project), there will be initial costs associated with the verification process (Global Green Bond Partnership 2019).

While research surrounding the existence of a "green premium"—an incremental price that buyers are willing to pay for a green bond over a traditional bond—is inconclusive, there are several advantages to issuing a green bond (Ehlers & Packer 2017). First, because the green bond is identical to a traditional bond except for the nonfinancial disclosures required to satisfy the GBP core components, there is very little downside to

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green bonds as compared to traditional bonds, aside from the costs mentioned previously. A green bond theoretically attracts three types of investors:

1. Investors who are committed to supporting environmentally sound securities and therefore seek out green bonds.
2. Investors who believe that issuance of a green bond is indicative of strong management and good corporate governance which, in turn, mitigate risk.
3. Investors who place no incremental value in the "green" element of the bond but are interested in the asset class.

Traditional bonds would only attract the third of these groups, so green bonds should attract a broader pool of investors. Attracting additional investors does not automatically provide a financial advantage; however, broadening the pool of potential investors does increase the likelihood that a subset of those investors is willing to pay a higher price for the issue.

Aside from the potential financial benefits, green bonds provide transit agencies with an opportunity to make a statement regarding their commitment to sustainability and a platform for driving toward their sustainability objectives. Issuing green bonds also allows issuers to develop a track record of commitment to sustainability, which could be an advantage as global financial markets realign to direct funding to projects with positive environmental impacts.

The only downside unique to green bond issuance that consistently arose in this research is the risk of "greenwashing"—that is, marketing a project as green that does not actually contribute a positive environmental impact. Greenwashing can occur because an issuer has the option to self-label any project as green. However, if an organization issues a green bond that the market receives poorly (because it is not believed to provide a significant positive environmental impact), the credibility of the issuer can be damaged and their ability to effectively issue green bonds in the future can be negatively impacted. For transit agencies, an obvious example is a green bond issuance that provides funding for assets that burn fossil fuels, even if they are replacing older, less efficient internal combustion engines. This risk should be carefully considered by issuers when funding projects that burn fossil fuels.

This report provides transit agencies and other stakeholders with information about green bonds and resources to develop green bond programs. The report covers key concepts, such as the main components of green bonds, elements that differentiate green bonds from traditional bonds, and costs and benefits of issuing green bonds instead of traditional bonds. The report also provides case studies that demonstrate how transit agencies have implemented green bond programs, along with an appendix of resources for potential green bond issuers.

CHAPTER 1

Introduction

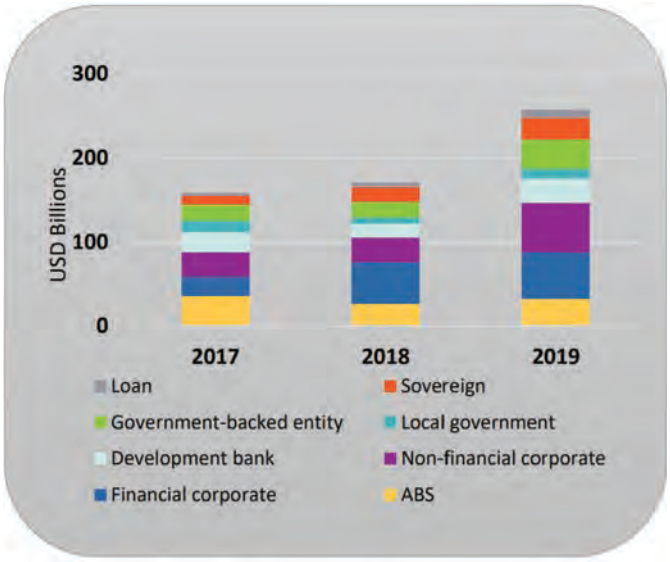
Overview of the Green Bond Market and Transit Green Bonds

Generally, a green bond is any bond in which the proceeds are earmarked for climate or environmental projects. Based on this broad definition, many transit projects have been obvious candidates for green bond funding due to the reduction in greenhouse gas (GHG) emissions associated with most transit projects.

Globally, the green bond market has continued to grow since its inception. The Climate Bonds Initiative (CBI) estimated that, in 2019, global green bond and green loan issuance increased by 51 percent over the 2018 figures, reaching $257.7 billion (CBI 2020a) (see Figure 1-1). In line with global trends, the United States has also seen growth in green bonds far greater than the general bond market. Despite this growth, the green bond market still represents a small percentage of the overall bond market. Green bond issuance accounted for only 3 percent of the $8.186 billion in US bond issuance in 2019 (Securities Industry and Financial Markets Association 2020). Investor demand for green bonds is expected to increase in the coming years, particularly as the millennial generation—which has shown more interest in sustainability than previous generations—increases its wealth (Chiang 2018).

While the transportation sector is a large source of GHG emissions, investments in transit projects can lead to fewer vehicles on the road, which can reduce carbon emissions, decrease traffic congestion, and improve air quality. Therefore, transit projects can make obvious candidates for green bond funding. Transit agencies around the world are committing to reducing their environmental impact. According to Standard & Poor's Financial Services (S&P), railway operators have expressed strong intentions to decarbonize through electrification (S&P Global Ratings 2019b). These intentions fit within a larger trend toward reducing carbon emissions within the transportation sector. Airlines are increasingly pledging carbon neutrality through efforts such as participation in the International Air Transport Association's (IATA's) Carbon Offsetting and Reduction Scheme for International Aviation program (IATA 2020); maritime organizations are increasing global efforts to cut emissions associated with shipping; and local governments across the globe are supporting the expansion of electric vehicle infrastructure (S&P Global Ratings 2019b).

Green bonds can be a useful tool to help agencies finance transit projects and attract new investors. In fact, the transportation sector represented 20 percent of the overall use of proceeds market in 2019 (CBI 2020a). In addition, transit green bonds generally have longer terms to maturity than other types of green bonds, their assets and size tend to be large, and they often have investment-grade ratings (CBI 2018a and S&P Global Ratings 2019b). These characteristics are becoming increasingly attractive for institutional investors (S&P Global Ratings 2019b).



Source: Climate Bonds Initiative (2020a).

Figure 1-1. Global green bond issuance, 2017–2019.

Although the issuance of green bonds is projected to increase, there are several barriers that could limit the expansion of green bonds in the public transportation sector. One of the primary barriers is the lack of clarity and agreement among stakeholders regarding what makes a bond "green." This absence opens the possibility for misalignment between investors and issuers in terms of what qualifies as green. Another obstacle is that many first-time issuers may be intimidated by green bonds and think that issuing green bonds is significantly more difficult and costly than issuing traditional bonds. Or issuers might not see green bonds as attractive because they lack an understanding of the financial and nonfinancial benefits of green bonds.

Goal of the Report

The objective of TCRP Project J-11/Task 38, "Analysis of Green Bond Financing in the Public Transportation Industry," was to provide the public transportation industry with an examination of green bonds, including an analysis of the different frameworks, definitions, benefits, risks, and costs. This resulting report identifies potential roles and benefits of green bonds in advancing sustainability goals of transit agencies, describes the value and costs of green bonds when compared to traditional bonds or other financing mechanisms, describes the lessons learned from previous instances of similar bond issuances, and identifies and contrasts alternatives to green bonds for advancing sustainability goals.

The report is primarily for transit agencies but may be useful to a wider audience, as indicated in Figure 1-2.

Research Methodology and Report Organization

To prepare the report, the research team reviewed available literature and conducted a series of interviews with representatives from transit agencies, financial advisors, rating agencies, and standards boards. The literature review established a foundation for understanding the green bond market, including comprehension of green bond frameworks and taxonomies.

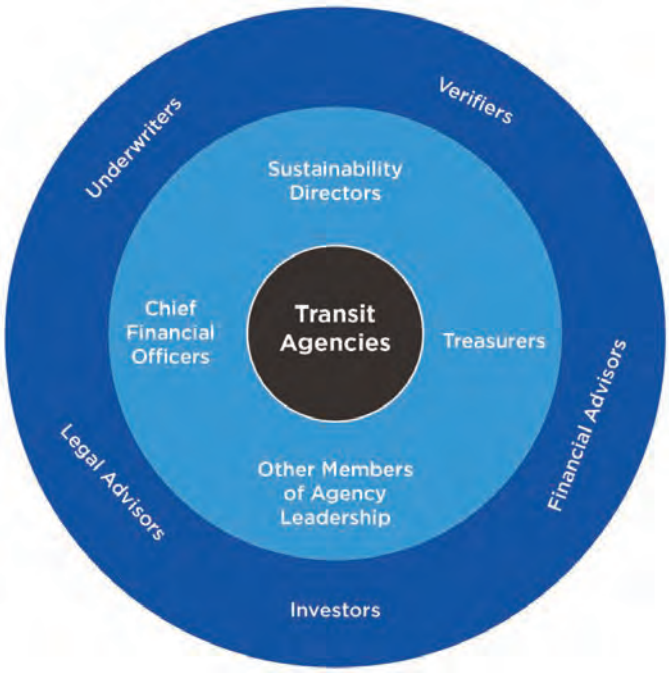


Figure 1-2. Audience for the report.

In addition to the literature review, the research team conducted a series of interviews with individuals representing a range of organizational affiliation and experience with green bonds. Throughout the interviews, the team explored participants' experiences with and perspectives on key concepts such as the definitions for green bonds, how to determine the value and costs of green bonds, and how transportation projects fit within green bond frameworks. The team conducted 13 interviews, and a list of the interview participants may be found in Table 1-1.

Table 1-1. Interview participants.

Title	Organization
Treasury Manager	TransLink
Financial Analyst	TransLink
Debt Specialist, Controller's Office of Public Finance	City and County of San Francisco
Managing Director	KNN, Inc.
Director, Enterprise Risk & Sustainability	TransLink
Principal, Fiduciary Financial Advisory	Sperry Capital
Director, Market Development	Climate Bonds Initiative
Deputy Director, Treasury Services and P3 Finance	Massachusetts Bay Transportation Authority
Director, Finance	New York Metropolitan Transportation Authority
Principal and Wealth Manager	Robasciotti & Philipson
Analyst, Green Bonds & ESG	Rating agency*
Vice President, Public Finance and Green Bonds	Financial services firm*
Deputy Treasurer, Public Finance	Treasurer of the State of California

*Name of firm removed at participant's request

The research focused on the International Capital Market Association's (ICMA's) Green Bond Principles (GBP) and the CBI taxonomy. While the GBP set a widely utilized, flexible framework, the CBI taxonomy provides a stricter set of guidelines for transit agencies that are issuing green bonds. The report explores the differences in these two approaches more fully in Chapter 2.

The literature review and interviews evaluated the costs and benefits of issuing green bonds. The research team considered several benefits such as helping transit agencies achieve their sustainability goals, broadening the investor pool, and allowing issuers to negotiate lower rates. A more detailed discussion is provided in Chapters 3 and 4.

Chapter 5 includes a discussion of the alternative financial tools that agencies may consider when evaluating green bonds. The chapter identifies and contrasts these alternatives and discusses when they may be appropriate.

Chapter 6 includes tips for transit agencies as they develop their own green bond programs. The suggestions within this chapter highlight best practices obtained through the literature review and the interviews conducted for this research.

Finally, Chapter 7 provides three case studies featuring transit agencies from the West and Northeast that have issued green bonds to finance transportation projects. These are intended to help agencies as they consider issuing their own green bonds.

CHAPTER 2

What Are Green Bonds?

Definitions

Consistent definitions ensure uniform understanding among key stakeholders in a bond issuance. Several interviewees mentioned that the definition of "green bond" is amorphous and interpreted differently by various individuals or organizations; and this uncertainty opens issuers up to negative reactions from the market. Green bonds as a financial instrument are clearly defined—they are traditional bonds with additional voluntary nonfinancial disclosures attached in order to demonstrate alignment with the core components of ICMA's GBP. However, there is considerable debate surrounding what projects should qualify for green bond financing.

Characterizing Green Bonds

As identified in Figure 2-1, the three main characteristics of green bonds are their environmental benefit, the fact that they are identical financial instruments to traditional bonds, and the fact that they have additional disclosures.

Put simply, green bonds are bonds issued to support finance initiatives with positive environmental impacts. From a credit standpoint, they are identical to traditional bonds. The voluntary nonfinancial disclosures attached to green bonds signal a more attractive long-term risk profile to the market compared to traditional bonds for those investors concerned with long-term environmental risks.

The biggest risk faced by a bond investor is the default of the issuer. For this reason, creditworthiness of the issuer is the investor's primary concern. With green bonds, the credit risk of the counterparty remains the same, but the additional nonfinancial disclosures allow investors to more thoroughly evaluate nonfinancial risks.

Understanding the Value of Green Bonds

Understanding the value of green bonds to investment managers is vitally important to understanding green bond issuance. Green bonds appeal to investors for two primary reasons:

1. As wealth is transferred from older to younger generations, and as society in general becomes more aware of the social and environmental impacts of investment and lifestyle decisions, demand increases for investments that generate positive social and environmental impacts along with financial returns—and the corresponding pressure on investment managers to identify those investments increases as well (Imberg and Shaban 2019).
2. As industry knowledge of environmental, social, and governance (ESG) risk evolves, institutional investors have an increased appetite for investment with a favorable ESG profile.

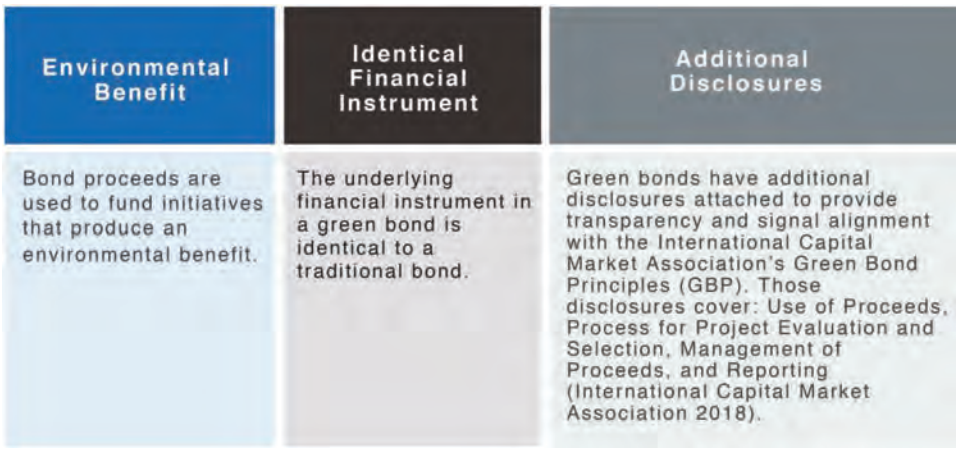


Figure 2-1. Elements that characterize green bonds.

According to RBC Global Asset Management's *2019 Responsible Investment Survey: An Evolving Landscape,* 65 percent of US investors (as well as 97 percent of investors in the UK and 80 percent in Canada) include ESG in investment decisions (2019).

Historically, certain costs have not been efficiently priced by financial markets. One of the most prominent is the cost related to GHG emissions born by the environment. As climate science evolves, the indisputable, quantifiable costs of climate change become apparent. For example, California State Treasurer Fiona Ma recently claimed that green bonds would be necessary to raise the billions of dollars required to upgrade California's infrastructure to deal with increasingly frequent severe weather incidents generated by climate change (California Debt and Investment Advisory Commission 2019).

Impact investors with niche interests were first to understand the financial implications of ESG risks. However, as this body of knowledge evolved, ESG risk has been mainstreamed and the narrative has shifted. This was highlighted in 2018 when Larry Fink, CEO of BlackRock (the largest asset manager in the world with over $6 trillion in assets under management), announced in his annual letter to CEOs that BlackRock could no longer invest in companies without a clearly stated social mission, as they ran the risk of losing their license to operate with key stakeholders and failing. In other words, poorly managed ESG risks can negatively affect financial returns.

Potential green bond issuers should be aware of the value that these offerings provide for investors. Green bonds fund projects and assets with favorable ESG risk profiles. Green initiatives are less likely to be affected by future tightening of environmental regulations because they are actively seeking to avoid negative environmental impacts. They are less likely to face opposition from groups of stakeholders concerned with environmental health, so their license to operate is stronger. Organizations that have a strong track record of issuing green bonds signal to capital markets that they are aware of the importance of ESG risk management and are therefore seen as favorable organizations to invest in, with all other things being equal.

History

Green bonds arose from investor demand. A short timeline of green bond history may be found in Figure 2-2. In 2007, the Intergovernmental Panel on Climate Change published a watershed report that strongly linked human activity to climate change. Prompted by the report, a group of Swedish pension fund managers contacted the World Bank to express a desire to

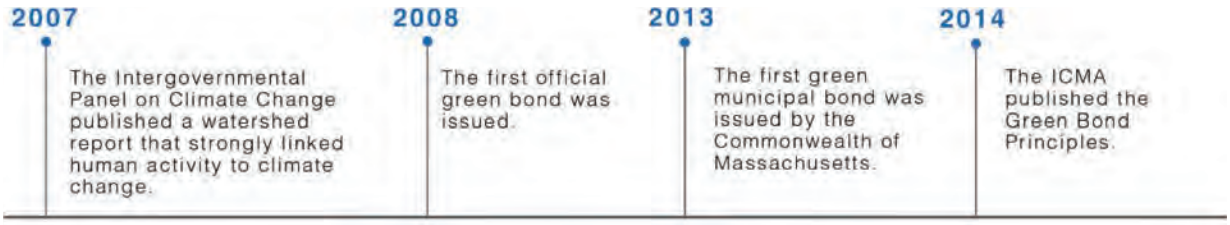


Figure 2-2. Major developments in green bond history.

invest in projects that had a positive impact on climate issues, but they were unsure of how to identify those projects accurately. The World Bank and Norway's Center for International Climate Research worked with the group, and in 2008 the first official green bond was issued. The first green municipal bond was issued by the Commonwealth of Massachusetts in 2013. In 2014, ICMA published the first edition of *Green Bond Principles*.

What Projects Typically Qualify for Green Bonds?

Broadly speaking, any project that an issuer identifies as having a positive environmental impact qualifies for green bond issuance. It is up to the issuer to communicate that opinion to the market. Interview participants were aligned in their belief that transit projects that do not burn fossil fuels automatically qualify for green bond issuance. Interview respondents were also aligned in their belief that green bond issuances to fund station upgrades and other aesthetic or user experience projects would not be received well by the markets. One gray area was replacing older assets with newer, more fuel-efficient assets that still burn fossil fuels but produce a considerable net savings in emissions. There was concern among some interviewees that the market would be hesitant to accept a green bond issuance that primarily funded assets that burn fossil fuels (particularly if there is an available alternative that uses renewable energy). However, others believe the technology should not matter if there is a compelling case for positive environmental impact.

If the issuance is poorly received by the market—whether because the case has been poorly made or because the projected environmental impacts are deemed dubious—the issuer runs the risk of damaging its reputation and limiting the viability of green bond issuance in the future.

This risk has led to a proliferation of tools designed to provide clarity around what projects qualify as green by setting specific qualification criteria. Some notable examples include:

1. CBI's Climate Bonds Standards.
2. National or regional sustainability taxonomies, such as the ones produced by the European Commission or China.
3. Independent verification.
4. United Nations' Sustainable Development Goals (SDG)—not strictly a green bond taxonomy but increasingly popular as a means of identifying appropriate target impacts of use of proceeds debt instruments like green bonds.

While these tools are a useful means of benchmarking projects and providing assurance to potential investors, they are not a prerequisite for green bond issuance. Interviews conducted with stakeholders in the transit green bond space returned a variety of opinions on the usefulness of these tools. Some found them invaluable for signaling commitment to the market, while others found them to be inflexible and excluding projects with a meaningful climate impact. Whether an agency decides to use any of these tools depends on the initiative being funded, along with the priorities and risk appetite of the agency issuing the bond.

Table 2-1. CBI eligibility for low-carbon transportation.

Automatically Qualified	Further Consideration Required	Automatically Disqualified
Tramways	Buses	Internal combustion engine vehicles
Metro	Bus rapid transit	Compressed natural gas vehicles
Public bikes	Commuter rail	New public infrastructure
Electric vehicles	Car-sharing information and communications technology	Parking facilities
Hydrogen-powered vehicles	Hybrid vehicles	Filling stations
Low-carbon fueling	Dedicated freight rail	
	High-speed rail	
	Interurban rail	
	Information and communications technology	

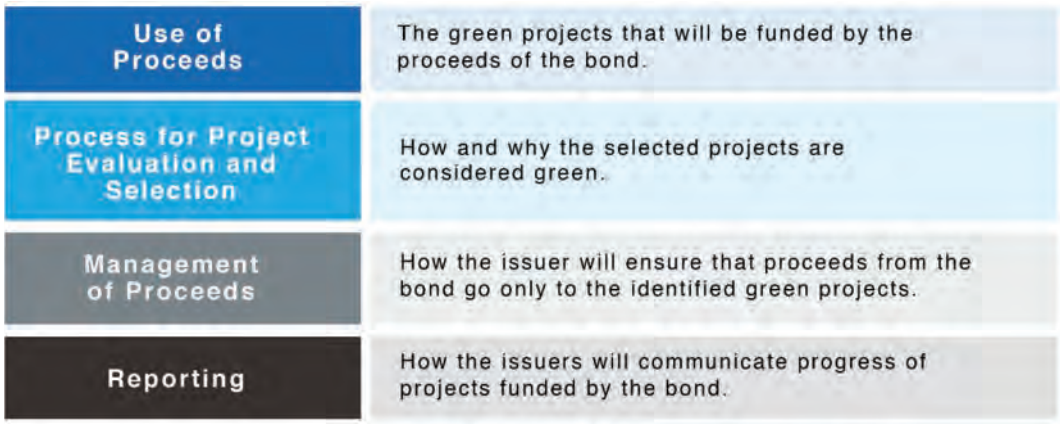
Source: Climate Bonds Initiative (2016).

For a more concrete example of how one of these frameworks views specific transit assets, CBI's eligibility list for low-carbon transportation is presented in Table 2-1.

Green Bond Issuance

Green bonds differ from traditional bonds in that they have additional voluntary non-financial disclosures to bring them into alignment with the GBP. These disclosures are outlined in Figure 2-3. In addition, issuers may benefit from identifying metrics that will demonstrate the impact of the project.

These disclosures provide investors with important information to evaluate ESG risks associated with financing, but the underlying credit risk of a green bond—and thus most of the issuance process—is identical to a traditional bond. However, the necessary disclosures do create additional considerations, particularly in the initial issuance when the



Source: International Capital Market Association (2018).

Figure 2-3. Core components of ICMA's Green Bond Principles.

issuer might need to codify the organization's stance on what constitutes a green project, as well as potentially develop an internal framework for classifying projects and measuring potential benefits.

Municipal bonds inherently carry significant monitoring and reporting standards. Interviewees largely agreed that the use of proceeds disclosure and tracking requirements for green bond issuance imposes significantly less burden for transit agencies than for other bond issuers that may be accustomed to less rigorous reporting requirements. This issue is discussed in greater detail in Chapter 3.

CHAPTER 3

Costs and Risks of Green Bonds vs. Traditional Bond Financing

Costs

Additional costs are incurred in the process of issuing a green bond compared to a traditional bond, but these additional expenses are minimal relative to the typical size of a transit bond issuance. An agency that is considering launching a green bond for the first time should expect some upfront costs to develop internal policies and processes. There will also be some additional costs incurred on a project-by-project basis.

The first instance of green bond issuance for an organization carries a higher burden of cost. Initial costs relate to the internal decision-making, process development, and learning required to identify appropriate projects, develop a prospectus, and establish a tracking system to satisfy use of proceeds reporting. For example, an agency needs to decide how it will judge whether a project is green. The agency will need to ensure that its accounting system has adequate controls to track whether the proceeds from the issuance are spent on designated projects. Finally, most interviewees indicated that their organization had established a sustainability strategy and goals prior to developing their first green bond issuance. Though some upfront investment is needed to issue a green bond, it is typically not prohibitive in relation to the size of most transit bond issuances, and the established processes can be applied to future issuances.

Interviewees were also aligned in noting that there are additional project-specific costs, but that they are minimal. Interviewees noted that their typical additional cost to issue a green bond (not counting third-party verification) was about $10,000, as the reporting requirements are only slightly more stringent than those already associated with municipal bonds. These costs were associated with the staff time required to develop the disclosures necessary to be aligned with the GBP, and they are likely to be broadly similar across agencies. Beyond costs associated with reporting, additional costs are variable and dependent upon the organization's strategy.

Self-labeled bonds might not undergo an external review or validation, so additional costs are limited to the actions that agencies decide are necessary. If issuers are concerned that the market might not receive an issuance positively or believe that the legitimacy of an external review or validation will help them attract additional investors, they may hire a third party to review or validate their issuance. In this case, there are additional costs associated with that review or validation. These costs vary from case to case, but even when combined with reporting costs, interview participants reported that they are still not prohibitive in comparison to the total size of the bond issuance.

Risks

Additional risks associated with green bond issuance in comparison to traditional bond issuance are minimal. The disclosures that differentiate a green bond from a traditional bond are voluntary and unenforceable.

Several interview participants did point out the risk of reputational damage from providing misleading information about the environmental impacts of a bond issuance. Misleading the market about an issuance in this manner is referred to as "greenwashing." If a green bond issuance is poorly received by the market because its projected environmental impacts are thought to be exaggerated, unlikely, or incorrect, the issuer opens itself up to accusations of greenwashing. These accusations can damage the issuer's organizational reputation and credibility, which can negatively impact future offerings. This risk can be mitigated by earmarking bond proceeds to ensure that they only go to identified green projects, adhering closely to the GBP, and communicating effectively and transparently about the impacts of the initiative with investors.

Greenwashing is particularly important to consider for issuers that are self-labeling their bonds, as they do not have the added protection of a second opinion that could confirm an agency's claims or flag concerns. If an organization elects to self-label, it should prioritize transparency and rigorous reporting to ensure effective communication of project impacts and minimize the risk of greenwashing.

One risk that many potential issuers share is that of clawbacks or penalty provisions, which require payment of a penalty if the advertised environmental benefits are not achieved. There is no evidence of clawbacks being a serious threat to green bond issuances in the literature, and no interviewees had seen this occur in practice. However, it is worth noting that a newer class of instruments (results-based financing, discussed in Chapter 5 of this report) does attach additional payments based on whether desired impacts were achieved.

CHAPTER 4

Benefits of Green Bonds and How Green Bonds Advance Sustainability Goals of Transit Agencies

As outlined in the previous chapter, although green bonds are similar to traditional bonds in many regards, there are specific costs associated with green bonds that differentiate them from traditional tax-exempt financing. Likewise, there are also specific financial benefits that transit agencies may want to consider when evaluating green bonds. The following section provides an overview of the financial and nonfinancial benefits of green bonds, which may help a transit agency attract a broader pool of investors, build a reputation for sustainability, and develop a sustainability culture.

Attracting a Broader Pool of Investors

Many parties interested in issuing green bonds are curious about whether they typically carry a premium. This "green premium" has been the subject of considerable research, and evidence is decidedly inconclusive. For example, several studies claim there is a pricing premium for green bonds, with evidence in the secondary market and anecdotal cases in the primary market (Climate Bonds Initiative 2019b, Cooper et al. 2017, Cooper 2018, Davies 2019, Hirtenstein 2017, Johansson 2019a, Kidney 2016, Ludvigsen 2015a, and Owen 2017). However, this is disputed among some market professionals (Buhr 2016, Chiang 2017, Climate Bonds Initiative 2018b, and Gilbert 2019).

This inconclusive pattern also persisted in the interviews conducted for this project. Anecdotally, some interviewees believe that they observed a slight financial advantage in comparison to a traditional bond issuance; others did not. None of the interviewees believe that they saw conclusive evidence of the existence or nature of a green premium outside of the anecdotal realm. This is not surprising; given that financial markets are incredibly dynamic, no two bonds are identical, and the definition of green is highly variable, it is exceedingly difficult to obtain sufficient data to quantitatively demonstrate a pricing benefit for green bonds.

However, there are more tangible benefits associated with green bond issuance, despite the lack of evidence of a green premium. As discussed earlier, both the literature and interview data suggest that issuing a green bond over a traditional bond attracts a wider pool of investors. Investors with an interest in green bonds can be generally characterized in three ways:

1. Investors who are committed to supporting environmentally sound securities, therefore they seek out green bonds.
2. Investors who believe that issuance of a green bond is indicative of strong management and good corporate governance, which, in turn, mitigate risk.

3. Investors who place no incremental value in the green element of the bond but are still interested due to the credit rating, tax-exempt status, or another reason (i.e., investors that would have been interested in the bond even if it was not green).

This diversification of the investor pool provides an opportunity for the issuer to leverage the increased demand by sourcing capital at a lower cost. One interviewee noted a 30 percent increase in the investor pool for a green bond compared to similar previous traditional bonds.

Additionally, some experts believe that in the United States, green bond uptake is limited by supply rather than demand. Consistent oversubscription for green bond issuance supports this theory (Chiang 2018). As previously mentioned, some interviewees believe this to be indicative of a larger trend in finance as funds are being transferred from baby boomers to younger generations. As the pressure mounts for issuers to incorporate ESG issues more effectively into investments, interviewees expect this trend to continue.

Building a Reputation for Sustainability Among Relevant Stakeholders

Interviewees discussed an increasing awareness of, and commitment to, sustainability issues among relevant stakeholders and constituents, which creates additional pressure on agencies and municipalities to demonstrate responsiveness to those priorities. By issuing green bonds, a transit agency can communicate to riders, employees, elected officials, investors, local or state transit agencies, and other constituents that the agency prioritizes sustainability. Interview participants also identified green bond issuance as an opportunity for transit agencies to make progress on their sustainability goals. Interviewees noted that transit agencies often developed green bond frameworks to build on existing planning documents or to respond to state or local directives. Green bond or sustainability frameworks served as the basis from which agencies could evaluate projects and begin issuing green bonds. For example, in its 2015 strategic plan, the Bay Area Rapid Transit (BART) highlights the need to advance regional sustainability and environmental efforts (BART 2015). BART's sustainability framework was adopted by the board in April 2017, and the transit agency issued its first green bonds in May of the same year (BART 2017).

Interviewees found green bond issuance to be an ideal means for transit agencies to signal their sustainability commitment to the community, particularly considering the minimal additional work required to issue a green bond instead of a traditional bond for most transit projects. Issuing green bonds provides a straightforward opportunity to protect an agency's social license to operate and burnish its organizational reputation, both within the metropolitan area and to outside constituents.

Developing an Agency's Sustainability Culture

By issuing green bonds, a transit agency can build or strengthen a culture of sustainability within the organization. Interviews with transit agency staff showed that the directive to either issue a green bond or develop a green bond financing framework often came from board members or agency heads. When agency leaders focus on sustainability, it signals to employees that the agency is prioritizing meeting sustainability targets and following through on a sustainability plan.

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The decision to pursue green bonds was not a top-down initiative in all cases. During discussions with representatives from transit agencies, interviewees also mentioned several instances where agency staff had been integral in the push to issue the first green bonds and the development of green bond frameworks. Empowering staff by allowing them to take a critical role in the development of green bond frameworks can reinforce the value of sustainability. Just as green bonds can play a critical role in developing an organization's reputation with its external constituents, interview participants expressed that an agency's emphasis on green bonds can also further its internal culture of sustainability.

The case studies in Chapter 7 provide examples of agencies leveraging green bonds to support a culture of sustainability.

CHAPTER 5

Alternatives to Green Bonds

Green bonds are a single instrument in a wider universe of financial tools that are being developed to help mobilize finance to confront larger societal issues. They are one important part of a wider push to make finance more sustainable by considering costs that have traditionally been ignored (for more information, see the sustainable finance frameworks in the appendix of this report). Understanding the way green bonds fit into this landscape can help issuers feel more confident in their offerings and identify additional financing options they can pursue.

When Should an Agency *Not* Issue a Green Bond?

While green bonds are a compelling option for transit agencies in many cases, interview participants identified certain instances in which green bond issuance would not be advisable:

1. When the decision to issue a green bond would be made after the issuance process has already begun, as this can require considerable additional work, including duplication of effort.
2. When the project has unclear environmental impacts. These projects can be poorly received by the market, which can damage the issuer's reputation and make future green bond issuances more difficult.
3. When a bond issuance is small enough that the costs associated with reporting or receiving a second opinion significantly increase the net cost of funding.

Use of Proceeds Market

Green bonds were created to meet the demands of investors aligned with the growing awareness of human impacts on the environment. Since then, the model has been adapted to direct capital toward a wide array of social and environmental issues. The resulting market is known as the "use of proceeds market" or the "ESG bond market." This market has grown to include bond issuances for initiatives focused on addressing social equity, public health, community resilience, and marine conservation—among others. An example of the flexibility of this model is CBI. CBI focuses on climate-related initiatives (rather than the larger universe of green initiatives, some of which may not have specific positive impacts on climate), which is reflected in that it certifies "climate bonds" rather than green bonds. Some other examples of the use of proceeds model include:

1. Social bonds (in which proceeds are used to generate positive impacts on social issues).
2. Sustainability bonds (in which proceeds are used to generate positive impacts on both social and environmental issues).

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3. SDG bonds (in which proceeds are used to generate impacts that are aligned with the United Nations' SDG).
4. Blue bonds (in which proceeds are used to support ocean conservation).

While these examples represent some of the growing number of use of proceeds instruments, the use of proceeds model can theoretically be adapted to support any type of impact, with the only limitation being demand. Of the above models, ICMA has published guidance for social bonds and sustainability bonds (in addition to the GBP). When a transit project reduces GHG emissions and improves access to public transportation, it may inherently qualify as a sustainability bond—an example of this can be found in the Massachusetts Bay Transportation Authority (MBTA) case study in Chapter 7 of this report. Additionally, social bonds may provide an opportunity for transit agencies to fund projects that improve access but would not be considered green by the market (e.g., developing a network of traditional fuel buses to a low-income neighborhood without existing access to public transportation).

Taxable Green Bonds

Traditionally, transit initiatives have been funded by tax-exempt municipal bonds. This type of issuance confers higher after-tax returns for investors with US tax liabilities. The lower nominal interest rates in tax-exempt bonds, however, discourage participation by people or entities not subject to US taxes. Interview participants noted that when interest rates—or "spread" differentials between taxable and tax-exempt bonds—are narrow, it may behoove an issuer to issue a taxable bond. A taxable issuance can attract a significantly wider pool of investors (and thus an opportunity to negotiate better terms). Interview participants noted that this could be particularly effective with transit bonds; the asset class is very familiar for large investors outside of the US, who may be interested in diversifying geographically. While interviewees noted that it was theoretically possible, none could point to an instance where a transit agency had elected to issue a taxable green bond.

Results-Based Financing

In addition to traditional use of proceeds financial instruments, there is a nascent market of sustainability-linked finance in which repayments are based on the impact achieved by the investment. An example of this type of instrument is an environmental impact bond (EIB). In an EIB, an issuer agrees to certain targets with the investors (including interest rate, time frame, and outcome metrics) and develops the project. After an agreed upon amount of time, a third party evaluates the initiative's effectiveness according to the metrics designated at the outset of the project. If the project outperformed the metrics, the municipality gives an outcome payment (funded by savings generated by the project) to the investors. If the project underperforms, investors pay the municipality a risk-sharing payment. The first example of an EIB was the 2016 D.C. Water Environmental Impact Bond, which funded green infrastructure to reduce stress on the city's shared sewer system through nature-based solutions (Quantified Ventures 2018).

There are two important factors to consider before attempting to issue a "linked" or "impact" bond:

1. The market for results-based financing is considerably smaller than the use of proceeds market. This is significant because an issuer will have a much smaller pool of potential investors and correspondingly less leverage in negotiating terms.
2. Sustainability-linked financial instruments are fundamentally different from traditional bonds. They carry significantly higher risk for investors, as poor nonfinancial performance (which is out of their control) would lead to weaker financial returns.

Green Loans

Green loans are very similar to green bonds, with the key difference being how funding is raised. Bonds raise funds from the investor market, and loans are funded by banks. This difference will preclude most transit projects from being financed through loans, as it is unlikely to find a single bank willing to fund a whole transit project on its own due to the large scale of most transit projects. Green loans could, however, be useful for smaller projects at large transit agencies (such as feasibility studies) or for small projects developed by small transit agencies.

Transition Bonds

Not all industries are well-suited for green bond issuance. Some industries (e.g., mining and heavy industry) are not—and never will be—environmentally friendly; these are known as "brown" industries. Because brown industries have an inherent negative environmental impact, they do not qualify for green bond issuance. However, in order to curb climate change, those industries will also need to find ways to reduce environmental damage. Transition bonds are a means of offering businesses in those industries an incentive to shift their operations toward more environmentally sustainable practices, wherever possible. This is a very new asset class—and it is not intended for inherently environmentally sustainable initiatives—but it bears monitoring for its potential to finance initiatives that can drive net GHG emissions reductions even if they would not have been received positively by the market in the form of green bonds (BNP Paribas 2019).

CHAPTER 6

Practical Tips for Using Green Bonds in Transit

The process to issue a green bond is similar to issuing any other tax-exempt bond. The main difference is that green bonds involve additional voluntary nonfinancial disclosures discussed in the GBP, which were outlined in Figure 2-3.

These processes are typically documented by the issuer in a green bond framework. Green bond frameworks provide an opportunity for an issuer to communicate its sustainability strategy and the processes it has implemented to manage green projects to potential investors. Helping investors understand how green projects fit into the issuer's larger strategy is a valuable opportunity to develop trust and confidence in bond issuances.

Even with these additional disclosures, transit agencies—regardless of size—are well-positioned to issue green bonds. Transit finance departments, advisors, and underwriters have experience complying with the already rigorous administrative and legal requirements of municipal bond issuance. Typically, the extra effort required and cost incurred to issue a green bond is minimal relative to the effort and cost of issuing a traditional bond. This limited incremental cost combined with the limited risks of issuing a green bond over a traditional bond make green bond issuance particularly compelling for this sector.

The following section provides an overview of the key tips for issuing green bonds that are outlined in Figure 6-1. The tips are based on input from the interviewees and published experience found during the literature review. A compilation of resources that transit agencies may use as they are evaluating green bonds and developing green bond frameworks is provided in the appendix attached to this report.

Decide Early to Issue a Green Bond

The decision to issue a green bond should be made as early as possible—ideally the decision should be made, and a framework should be developed, before the bond issuance process begins. This level of preparation allows issuers to focus on the bond issuance instead of concurrently trying to develop their organization's sustainability strategy.

Before issuing the bond, a comprehensive list of the positive impacts of the project should be laid out and compared with the three sets of principles published by ICMA: the GBP, the Social Bond Principles, and the Sustainability Bond Principles. This is particularly important if there are some environmental impact concerns but there is significant societal benefit. Regardless of the type of bond, the decision to label a bond offering should be made as early as possible.

Figure 6-1. Tips for agencies to consider when issuing green bonds.

Ensure Funded Projects and Assets Are Green

Not all financed or refinanced projects and assets will be eligible for green bond financing. For example, projects that include substantial onsite parking facilities could be considered to be promoting individual auto transportation over mass transit and would be unlikely to qualify as green bonds. In addition, transit projects with a more indirect link to GHG reduction—such as those that involve cosmetic improvements to stations—would be unlikely to be considered green, although these upgrades may be critical to the long-term viability of the transit network. Recognizing projects that can demonstrate direct environmental benefit is important when it comes to meeting eligibility requirements. According to the GBP *Guidance Handbook*, "Green, social, or sustainability bonds must have 100 percent of proceeds dedicated towards green and social projects" (ICMA 2020c).

As discussed in Chapter 3, accusations of greenwashing could be damaging to an issuing agency. One way to guard against this possibility is to involve staff that is knowledgeable of environmental and social best practices in as much of the issuance process as possible. These team members can also be instrumental in developing and implementing use of proceeds and project selection sections of the agency's initial green bond framework.

Develop a Green Bond Program

If multiple bond offerings are planned, it may make sense for an agency to create a green bond program to take advantage of these efficiencies. Transit agencies that have a formal green bond program include New York Metropolitan Transportation Authority (MTA) and MBTA (see Chapter 7). CBI also offers a streamlined certification process for programs like these. Programmatic Certification involves the annual verification and certification of a pool of eligible assets rather than dealing with each green bond separately (CBI 2020d).

The appendix at the end of this report contains a list of resources that are potentially helpful for a transit agency issuing its first green bond. The appendix includes links to the relevant ICMA principles surrounding green, social, and sustainability bonds; CBI's taxonomy for determining whether an initiative is green; several examples of green bond frameworks issued by transit agencies; and useful webinars for training staff on the core concepts of green bonds.

Adhere to Your Green Bond Framework

Green bond frameworks establish investors' expectations. An effective framework clearly establishes the processes for managing the disclosures required for alignment with the GBP, the elements of which

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were outlined in Figure 2-3 earlier. Despite the GBP being a voluntary framework, straying from the plan laid out in the framework can erode investor confidence and ultimately harm an organization's ability to issue green bonds. If deviating from the framework is unavoidable, the agency should be proactive in disclosing this to investors and hearing their concerns.

A simple green bond framework template can be found at ICMA's website. Transit agencies can also look to frameworks published by other transit agencies.

- Example green bond frameworks:
  - Los Angeles County Metropolitan Transportation Authority (LA Metro 2017).
  - South Coast British Columbia Transportation Authority (TransLink 2018).
  - SNCF Réseau (French Railway 2016).
  - RZD (Russian Railways 2019).
  - Citi Green Bond Framework (Citi 2019).
- An example sustainability bond framework:
  - Massachusetts Bay Transportation Authority (MBTA 2017b).

Identify Internal and External Expertise

Given that the underlying financial instrument in a green bond is identical to a traditional bond, agencies already have the appropriate financial processes for issuance in place. Tracking and reporting on allocation of proceeds as well as refinancing is common, if not required, especially for tax-exempt offerings. Agencies can draw upon existing financial staff and infrastructure to track and report on green bond allocations.

It is helpful to get the agency's sustainability team involved directly in the issuance as early as possible. Interview participants noted that agencies that have their finance teams engage directly with their sustainability teams generally seem to enjoy a smoother issuance process. Interviewees mentioned that technical experts, such as scientists and engineers, working collaboratively with the finance team ensured specificity of language and appropriate metrics. Participants believed that the technical perspective was also important at conferences and other investor gatherings, where investors often had specific technical concerns that were vital to their investment decisions. Interviewees also advocated for multidisciplinary participation in long-range financial planning documents, such as capital improvement plans, to ensure that included projects are scoped in such a way that they meet third-party verification criteria. Smaller transit agencies that may not have environmental or sustainability expertise on staff could get additional assistance from a consultant or knowledgeable advisor.

Even with cross-departmental collaboration, selecting a lead bond underwriter and/or financial advisor who has experience with issuing a green bond can be helpful. If the team generally lacks experience, it is especially important to have a knowledgeable advisor.

External reviewers and verifiers are another source of available expertise. Although they must maintain independence (meaning they cannot provide consulting services and then review their own work), external reviewers can point to examples of best practices as well as common concerns. The CBI Certification program maintains a list of Approved Verifiers reviewed by the Climate Bonds Standard Board (CBI 2020b). Credit rating agencies are another good option for external reviewers that have their finger on the pulse of investors. Distributing some of the burden of a green bond issuance, particularly an initial issuance, is helpful in developing internal capacity and providing a better offering.

Draw on Lessons Learned from Other Agencies and Leverage Available Resources

Green bonds have been issued by transit agencies since 2015. Chapter 7 presents three case studies of green bond programs in US transit agencies. Although these case studies focus on the efforts of large transit agencies, smaller agencies can still draw upon the lessons learned. Green municipal bond offerings in areas other than transit are also a valuable source of lessons learned. For example, municipalities and agencies of all sizes have issued green wastewater treatment, clean energy, and energy efficiency bonds.

Examples of these offerings can be found in consolidated databases from ICMA and CBI. ICMA offers free access to a historic database with a list of offerings and resources. The database contains green and sustainability bonds listed by issuer, category (green or sustainability), and country (ICMA 2020a). Although the database goes back to 2016, it is voluntary—only entities that have requested to be featured are shown. Currently, there are no US transit agencies listed, but there are several other US municipal and state agency offerings.

Agencies can also use existing environmental or sustainability resources for their green bond issuance. Environmental and sustainability goals and reports—such as a sustainability plan or annual GHG reporting—can be used to justify green bond financing and track impact. Some common reported measures include carbon intensity (e.g., GHG reductions per passenger), transit accessibility, transportation affordability, and level of service to lower-income patrons. Agencies can also draw upon their sustainability team members to assist with assessing project or asset eligibility.

Additionally, CBI offers a more comprehensive and recently updated (within the last three months) listing of labeled green bond offerings (CBI 2020c). This database contains data on several attributes of green bonds, including amount issued, currency, issue date, maturity, and links to external review/verification reports where available. CBI also offers a free searchable database of all certified climate bonds. Both of these databases can be found in the appendix of this report. Information can be found on Low Carbon Land Transport climate bonds issued by agencies such as MTA, LA Metro, and BART. Other for-fee green bond databases include Bloomberg, Cbonds, Dealogic, and Environmental Finance (ICMA 2018).

One of the most comprehensive sources of green, social, and sustainability bond guidance and tools is ICMA's website. Not only did ICMA work groups develop the Green, Social, and Sustainability Bond Principles, they also provide links to several additional resources (ICMA 2020b). Further lessons learned are presented in the case studies in Chapter 7.

CHAPTER 7

Case Studies

Many transit agencies have begun to review the costs and benefits of green bonds and how they might fit into their current financing structure. This chapter aims to highlight some of the agencies who have paved the way for transit green bonds, providing market expertise and lessons learned along the way. While the case studies presented in this chapter highlight the work of large transit agencies, green bonds are also achievable for municipalities and smaller agencies. The following lessons learned, experiences, and market responses are still applicable to the green bond issuance process for smaller entities.

Massachusetts Bay Transportation Authority

Type of Green Bond: sustainability bond (self-labeled)

Issue Date: 2017

Issuance Amount: $99 million

Funding Type: project bond

In 2017, MBTA issued the US's first tax-exempt sustainability bond. The $99 million self-designated sustainability bond issuance funded more than 100 social and environmental projects (MBTA 2019). To justify the sustainability label, MBTA established clear processes and expectations for selecting eligible sustainability projects as documented in MBTA's Sustainability Bond Framework. The framework incorporated guidance from ICMA's Sustainability Bond Guidelines, which identify standards for determining project eligibility; for tracking bond proceeds; and for reporting on project impact and advice from external stakeholders, including investor groups, the academic community, and peer issuers.

Before issuance, MBTA formed an internal Sustainability Committee made up of internal stakeholders, directors, and managers to lead the drafting of the Sustainability Bond Framework (Sustainable Investing 2020). Representatives from capital planning, treasury, safety, environmental, and accessibility departments served on the committee. These individuals were selected from an internal survey asking who had capacity, interest, and a knowledge base to help.

MBTA's final decision to issue a sustainability bond was based on significant internal discussion, as well as consultation with external stakeholders. The objective of this external outreach was to fully understand the economic and reputational risks associated with the transaction. The specified environmental and social spending priorities for the agency included reducing GHG emissions through improvements in rider capacity, preventing pollution, reducing noise, increasing equity, promoting safety, and improving accessibility. The framework also set up a clear project selection process for the sustainability bond. To select projects, the internal Sustainability Committee nominated projects from MBTA's capital program that

Source: Massachusetts Bay Transportation Authority.

Figure 7-1. Accessibility improvements at MBTA facilities.

specifically met at least one of the social or environmental spending priorities stated in the framework (MBTA 2019).

The sustainability proceeds funded projects ranging in size from around $100,000 to $9.8 million. The majority of projects fell into the priorities of climate resiliency, rider capacity, pollution prevention, and accessibility (see Figure 7-1). Projects in these categories included construction of a redesigned seawall to protect an essential bus facility from worsening storms, prevent scour and erosion, and minimize runoff; installation of a new fare collection system to make payment easier and improve accessibility to more riders; and procurement of compressed natural gas and diesel-electric hybrid buses to replace older diesel buses (MBTA 2019). MBTA publishes an annual Sustainability Bond Progress Report which documents performance.

This transit sustainability bond received a favorable response from the market. MBTA reported that more banks participated in the sustainability bond offering than the current traditional bond offering. In fact, six of the eight banks that participated in both offerings submitted more aggressive bids on the sustainability bond. In the end, MBTA's borrowing cost was lower for the sustainability bond than the traditional bond. This increased demand translated into a lifetime interest savings of approximately $2.60 per $1,000 issued (MBTA 2019).

With such a favorable market response, MBTA's 2017 sustainability bond was recognized as *The Bond Buyer*'s 2017 Northeast Regional Deal of the Year, and it was a finalist for the National Deal of the Year. MBTA even issued an additional $271 million in sustainability bond anticipation notes in 2017 and plans to continue issuing sustainability bonds in the future (MBTA 2019).

Greatest Challenge

- Determining which projects are eligible for a sustainable bond.

Solution

- Developed an internal framework to determine project eligibility for a sustainable bond and organized a committee of stakeholders—familiar with each project—to help with the assessment.

Greatest Success

- Finalist in *The Bond Buyer*'s National Deal of the Year, attracting attention from additional investors.

Lessons Learned

- Established that social and environmental benefits inherent in many transit projects could be leveraged for issuing sustainability bonds.
- Established that there is a demand from investors for sustainability bonds.
- Helped MBTA consider new ways to measure sustainability benefits from funded projects.

New York Metropolitan Transportation Authority

MTA issued its first in a series of certified climate bonds in February 2016 for $782 million. Since then, MTA has issued 12 more certified climate bonds, ranging in size from $200 million to $2.17 billion, as part of their ongoing green bond program (CBI 2020c).

Type of Green Bond: Certified Climate Bonds Program

Issue Dates: 2016–2020

Total Program Amount: $11.3 billion

Funding Type: pooled funding

Greatest Challenge

- How to reconcile MTA's process of pooling bonds for projects rather than issuing individual bonds with the requirements for certified climate bonds.

Solution

- Programmatic Certification by CBI for the portion of the pooled bonds used for qualifying projects.

Greatest Success

- Recognition by *Environmental Finance* as the 2018 Municipal Green Bond of the Year.

Lessons Learned

- CBI-certified bonds generated greater demand for MTA's offerings.
- Establishing a programmatic approach resulted in lower transaction costs than initially anticipated.

MTA understood the inherent climate benefits that public transportation provides by shifting transportation demand away from private vehicles. The agency also knew that this benefit is not always realized in the market and that offering a green bond was a way of raising this awareness. The decision to do so was made at a very high level in the agency. The Chief Financial Officer recommended the issuance of green bonds, and the Board of Directors was consulted before proceeding.

Usually, climate bond certification applies to bonds for specific climate-related projects that are identified and tracked for each bond issuance. MTA found that its size and complex financial processes, including pooled funding for projects, made tracking bond proceeds to specific projects difficult. As a result, MTA had to take a slightly different approach to green bond issuance and certification.

MTA and CBI agreed that the inherent benefit of MTA's transit and commuter systems was consistent with reducing GHG emissions to levels specified by the Paris Agreement (MTA 2019). CBI agreed to certify a portion of the pooled bonds up to the percentage of MTA's capital program that is annually verified as eligible under CBI's Low Carbon Land Transport sector criteria. This Programmatic Certification has allowed MTA to access a relatively large amount of funding for a pool of climate-related projects at a lower level of cost and effort than initially anticipated.

As a result, MTA issues at least one bond a year to fund the transit and commuter systems portion of its capital programs. Proceeds from bond sales have been allocated to capital investments in MTA's electrified rail assets, such as expansion of existing railways, procurement of subway cars, and construction of new stations. Proceeds also went to improvements supporting infrastructure, including line structures, maintenance yards, signals, and communications. In 2017 and 2018, *Environmental Finance* recognized MTA's offering as the Municipal Green Bond of the Year (*Environmental Finance* 2020).

MTA's Director of Finance, Patrick McCoy, explained the benefits MTA has seen as a result of these certified climate bonds. He says the green label helps "attract additional investors that may not otherwise be interested." These investors represent a "growing base of interested bondholders looking to invest in green and sustainable projects." While these investors do not directly translate to a pricing benefit, it does facilitate "a more efficient ultimate price to the MTA and translates to our paying lower interest for the cost of its life" (Debtwire 2017).

Los Angeles County Metropolitan Transportation Authority

Type of Green Bond: Certified Climate Bonds Program

Issue Dates: 2017 & 2019

Issuance Amounts: $471 million & $419 million

Funding Type: project bond

LA Metro has a sustainability vision to "be the leader in maximizing sustainability efforts and its benefits to LA County's people, finances, and environment" (LA Metro 2020). To realize that vision, Metro established goals in key sustainability areas.

Metro has issued two certified climate bonds to finance projects to support its sustainability and climate goals. The first was issued in 2017 for $471 million, and the second followed in 2019 for $419 million (CBI 2020b). Both bonds funded climate-related projects associated with the development and construction of electrified light and heavy rail transportation systems (see Figures 7-2 and 7-3).

Source: LA Metro (2018).

Figure 7-2. Purple Line extension, Section 2 groundbreaking.

To facilitate the bond issuance and verification process, Metro developed a framework in conformance with CBI requirements and existing sustainability and climate change commitments. To ensure alignment with LA County and Metro's commitments, the framework incorporated language from the agency's Sustainability Implementation Plan and Environmental Policy, as well as the Los Angeles Countywide Sustainability Planning Policy. The agency's Sustainability Implementation Plan identifies actions to address key issues such as climate adaptation and resiliency, livable neighborhoods and equity, and economic and workforce development. The agency's Environmental Policy includes commitments to mitigating potential negative impacts on the environment related to its operations. The Countywide Planning Policy defines outcomes and establishes measurements related to developing a Sustainable Regional Transportation System.

Metro's Treasury Department collaborated with the Environmental Compliance & Sustainability Department (ECSD) to leverage internal expertise and review projects in the capital program to identify those projects that met CBI's climate criteria and complied with city, county, state, and FTA sustainability objectives (LA Metro 2017).

Source: LA Metro (2019).

Figure 7-3. Crenshaw/LAX Line restoration work.

28 Analysis of Green Bond Financing in the Public Transportation Industry

Greatest Challenge

- Deciding whether and how to issue green bonds.

Solution

- Exchanged ideas and opinions between Treasury and ECSD. This dialog resulted in the initial decision to move forward with a green bond and to facilitate development of the green bond framework.

Greatest Success

- Being recognized by *The Bond Buyer* as ESG/Green Bond Deal of the Year 2019.

Lessons Learned

- Issuing climate bonds helped build upon the agency's sustainability culture.
- Use of cross-departmental staff was key in the bonds' success.

To become CBI certified, Metro had both bonds verified to ensure that they met the requirements of the Climate Bonds Standard for Low Carbon Land Transport. Pre- and Post-issuance verifications were conducted by an approved verifier (CBI 2020b). During the verification, Metro brought together representatives from across the organization to help the verifier better understand the relevant projects and to build internal understanding of the green bond process within Metro. After reviewing provided information such as the Preliminary Official Statement, project eligibility, and available reporting, the verifier issued an independent verification report and statement/opinion (First Environment 2017; First Environment 2019).

The 2017 certified climate bond funded approximately 20 projects focused on the development and improvement of Metro's electrified rail. The projects ranged in size from around $700,000 to $245 million and included activities such as line extensions, station refurbishments, installation of ADA ramps, and electric light rail vehicle procurement (LA Metro 2017). To date, the 2019 bond has been used to fund four projects that address connectivity, track and system refurbishing, and facilities improvements.

Aligning Metro's bond framework with its overarching sustainability policies has helped the agency make progress toward its environmental and climate goals, including the objective of reducing GHG emissions by 79 percent below 2017 levels by 2030 (LA Metro 2017). Metro also took advantage of its existing sustainability reporting by using its annual Energy & Resource Report to demonstrate the projects' positive impacts to stakeholders.

As a result of these processes for transparency and integration, Metro was recognized as *The Bond Buyer*'s ESG/Green Deal of the Year 2019 (*The Bond Buyer* 2019).

CHAPTER 8

Conclusion

This report presents important considerations for agencies debating whether they should issue a green bond. As financial markets around the world continue to realign to reflect investor demands, green bonds are an effective means for capturing the value of initiatives that have positive environmental impacts and have traditionally not been rewarded by the market. However, it is important to recognize that green bonds, or even the wider universe of use of proceeds bonds, are not a "magic bullet" or a "one-size-fits-all" solution. As the use of proceeds market evolves, transit agencies will have an opportunity to continue to track and explore ways they can parlay the inherent positive impacts of their projects into a financial advantage. Transit agencies should also be cognizant of the potential risks associated with greenwashing, which can include damage to transit agencies' credibility and negative impacts to their ability to effectively issue green bonds. The appendix at the end of this report provides links to valuable resources that transit agencies can utilize to expand their understanding of sustainable finance and make informed decisions on how best to incorporate the available resources into their strategies going forward.

This report is not intended to be the "last word" on transit green bonds. This is a young and dynamic market; as it evolves and matures, further research would build confidence in transit agencies, and potentially increase the number of transit green bonds issued. Ideas for future research include:

- Exploration of the challenges—and potential solutions to those challenges—that face smaller transit agencies interested in green bond issuance.
- Comparison of green bond issuances by transit agencies outside the US to mine best practices.
- Investigation of how the use of proceeds model can be leveraged to direct funds toward other issues, such as social equity.
- Quantitative comparison of the advantages to taxable versus tax-exempt green bond issuances for transit agencies.
- Cost-benefit analysis of rigorous post-issuance reporting to determine whether agencies that report rigorously enjoy advantages on future issuances.

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APPENDIX

Green Bond Links and Resources for Transit Agencies

The following is a compilation of resources from this report that transit agencies may use as they are evaluating green bonds and developing green bond frameworks.

Definitions and Taxonomies

For understanding how different groups are defining what qualifies as green. The International Capital Market Association's Green Bond Principles (GBP) lay forth the requirements for what constitutes a green bond and are essential for understanding the issuance process. The Social Bond Principles provide similar guidance for initiatives that generate positive social impacts. The Sustainability Bond Principles are a combination of the requirements for the other two frameworks. The Climate Bond Initiative's resources provide some insight into what qualifies as a green project for one of the most prominent verifiers of green bonds.

- International Capital Market Association:
  - Green Bond Principles
  - Social Bond Principles
  - Sustainability Bond Principles
- Climate Bond Initiative:
  - Standard Taxonomy
  - Taxonomy for Low-Carbon Transportation

Sustainable Finance Frameworks

For understanding sustainable finance priorities worldwide, and how transit agencies can play a role. These frameworks are not specifically focused on green bonds, but they provide broader context into how markets are coalescing around sustainability.

- Relevant frameworks:
  - Task Force for Climate-Related Financial Disclosures (TCFD)
  - Final Report of the EU Technical Expert Group on Sustainable Finance
  - Equator Principles
  - United Nations Principles for Responsible Investment (UNPRI)

Green Bond and Sustainability Bond Frameworks

For understanding how agencies make their decisions on green and sustainable bonds and communicate that decision-making process to investors. Transit agencies can use these documents to understand how the GBP shape the issuance of a green bond, and to see the different strategies

adopted by these different successful green bond issuers. Similarly, the Massachusetts Bay Transportation Authority (MBTA) framework provides an example of a framework for a sustainability bond. Transit agencies can use the MBTA framework to explore the opportunity for expanding the types of initiatives that can be funded by use of proceeds instruments.

- Example green bond frameworks:
  - Los Angeles County Metropolitan Transportation Authority
    - https://www.climatebonds.net/certification/los-angeles-county-mta
    - https://www.bloomberg.com/news/articles/2020-08-11/la-metro-prices-its-biggest-bond-deal-ever-as-ridership-plunges
  - South Coast British Columbia Transportation Authority
  - SNCF Réseau
  - RZD
  - Citi Green Bond Framework
- Example sustainability bond frameworks:
  - Massachusetts Bay Transportation Authority

Green Bond Databases

For searching available compiled data on green bonds. Transit agencies can use these documents to familiarize themselves with prior green bond issuances.

- CBI Labelled Green Bonds Data
- CBI Certified Green Bonds Data

Additional Resources

For developing an understanding of the core concepts of green bonds. Transit agencies can use these webinars to introduce these important topics to anyone who may be involved in a future green bond issuance.

- California Debt and Investment Advisory Commission:
  - Green Bonds Webinars

Abbreviations and acronyms used without definitions in TRB publications:

A4A	Airlines for America
AAAE	American Association of Airport Executives
AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
ACI–NA	Airports Council International–North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
APTA	American Public Transportation Association
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATA	American Trucking Associations
CTAA	Community Transportation Association of America
CTBSSP	Commercial Truck and Bus Safety Synthesis Program
DHS	Department of Homeland Security
DOE	Department of Energy
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FAST	Fixing America's Surface Transportation Act (2015)
FHWA	Federal Highway Administration
FMCSA	Federal Motor Carrier Safety Administration
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
HMCRP	Hazardous Materials Cooperative Research Program
IEEE	Institute of Electrical and Electronics Engineers
ISTEA	Intermodal Surface Transportation Efficiency Act of 1991
ITE	Institute of Transportation Engineers
MAP-21	Moving Ahead for Progress in the 21st Century Act (2012)
NASA	National Aeronautics and Space Administration
NASAO	National Association of State Aviation Officials
NCFRP	National Cooperative Freight Research Program
NCHRP	National Cooperative Highway Research Program
NHTSA	National Highway Traffic Safety Administration
NTSB	National Transportation Safety Board
PHMSA	Pipeline and Hazardous Materials Safety Administration
RITA	Research and Innovative Technology Administration
SAE	Society of Automotive Engineers
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (2005)
TCRP	Transit Cooperative Research Program
TDC	Transit Development Corporation
TEA-21	Transportation Equity Act for the 21st Century (1998)
TRB	Transportation Research Board
TSA	Transportation Security Administration
U.S. DOT	United States Department of Transportation

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