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Guidelines for Climate Action Planning

Abstract: This *Recommended Practice* presents reasons why agencies should undertake climate action planning, lays out a framework for approaching such planning, and discusses considerations to keep in mind as an agency goes through the planning process.

Keywords: climate action plan (CAP), emissions, greenhouse gases (GHGs), sustainability

Summary: Climate action planning presents transit agencies with the opportunity to engage with jurisdictional partners to demonstrate and ensure consideration of the strong potential of transit to provide substantial reductions of GHGs at a local, regional and global scale. Transit has a unique role in climate action planning, as it provides more carbon-efficient transportation than personal automobiles. Additionally, transit facilitates greater use of non-motorized modes such as walking and bicycling and creates large "co-benefits," such as lower-energy homes and neighborhoods. Modeling of these combined benefits has shown that transit can reduce regional GHG emissions equal to many times those it emits. Transit, thus, emerges as a key GHG reduction tool and needs to increase rather than decrease its carbon footprint as long it does so due to system expansion and increased ridership, rather than due to reduced efficiency. Since they have focused on automobile-based strategies such as low-carbon fuels and battery and engine technologies while disregarding the direct and indirect emission reductions attributable to transit, statewide and regional CAP approaches to the transportation sector to date have undervalued the ability of transit to reduce regional GHG emissions. This guidance document is designed to help transit agencies reverse this trend.

Scope and purpose: This *Recommended Practice* is one of a series of Sustainability and Urban Design Standards documents designed to support APTA members as they work to advance their sustainability practices. The purpose of this document is to provide guidance on the methods and factors that should be considered in climate action planning.

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1. Setting the stage: context for climate action planning

This APTA guideline is one of a series of Sustainability and Urban Design Standards documents designed to support APTA members as they work to advance their sustainability practices. The motivation for undertaking that effort is well put by the preamble to the APTA Sustainability Commitment:

> Sustainability, preserving the environment, being socially responsible and maintaining economic viability, with an overall contribution to quality of life, is integral to what we do and what we provide as the public transportation industry. Many APTA members have already made sustainability a strategic objective and have made great strides to increase the sustainability of their own organizations, in great part as a way to become more resource efficient, engage more with employees and customers and grow ridership, market share and funding support. And the drive toward sustainability is increasing as issues such as climate change, energy independence, preservation of resources and quality of life rise to the forefront in the public and political arenas.

As part of these broader sustainability efforts, many local jurisdictions are developing climate action plans (CAPs) to understand how to reduce their greenhouse gas (GHG) emissions. Transit agencies are also striving to take a leadership role on this issue, through advocating for strategies and investments to provide the public with clean travel choices that help to reduce GHG emissions locally, regionally and globally, while at the same time improving their own performance. They are also recognizing that climate change could have substantial impacts on their operations and are seeking to anticipate and respond proactively. The purpose of this document is to provide guidance to the transit industry on the methods and factors that should be considered in climate action planning.

1.1 Why make a climate action plan?

While the reasons for engaging in climate action planning can be many, they essentially fall into one of two categories: “You have to” or “You want to” — that is, reasons that are externally driven or those that are internally driven, or what one might term “policy mandates” and “policy direction.”

1.1.1 Policy mandates

Externally driven plans are usually the result of a policy mandate in which an agency is instructed to conduct such a plan on its own or in conjunction with other agencies. This can be at the behest of a local, regional or state authority (all of which have occurred), or (eventually) a national or international authority.

For example, the San Francisco Metropolitan Transportation Authority (SFMTA) is undertaking a CAP as a result of adoption of citywide goals for GHG emission reductions. SFMTA and other city departments have been directed by the city’s Department of the Environment to create plans to meet the city’s 2012 goal for 20 percent GHG reduction below 1990 levels. In addition, Proposition A, passed by voters in 2007, mandates a 20 percent GHG reduction in the city’s transportation sector and calls for SFMTA to prepare its own climate action plan. In the Seattle region, King County Metro Transit, as a part of King County government, prepared its climate plan in response to a directive from the King County Council. In the case of California, local and regional climate action planning efforts in the transportation sector and beyond are now also being driven by state-level directives resulting from legislation such as AB 32, SB 375 and SB 97. At a national scale, the White House Council on Environmental Quality has recently proposed draft guidance on when and how federal agencies must consider GHG emissions and climate change in their proposed actions under the National Environmental Protection Act (NEPA).

Even if mandated, climate action planning presents transit agencies with the opportunity to engage with these various jurisdictional partners to demonstrate and ensure consideration of the strong potential of transit to provide substantial reductions of GHGs at a local, regional and global scale. Transit has a unique role in climate action planning, as it provides more carbon-efficient transportation than personal automobiles, based

upon current occupancy and fuel-efficiency standards for both modes.[1] Additionally, transit facilitates greater use of non-motorized modes such as walking and bicycling and creates large "co-benefits," such as lower-energy homes and neighborhoods. Modeling of these combined benefits has shown that transit can reduce regional GHG emissions equal to many times those it emits.[2] Transit, thus, emerges as a key GHG reduction tool and needs to increase rather than decrease its carbon footprint as long it does so due to system expansion and increased ridership, rather than due to reduced efficiency. Since they have focused on automobile-based strategies such as low-carbon fuels and battery and engine technologies while disregarding the direct and indirect emission reductions attributable to transit, statewide and regional CAP approaches to the transportation sector to date have undervalued the ability of transit to reduce regional GHG emissions. This guidance document is designed to help transit agencies reverse this trend.

1.1.2 Policy direction

In the absence of an external mandate, there are still many compelling reasons why agency leadership might feel that engaging in climate action planning is an advisable approach by which to advance its strategic objectives. Primary among these are the following:

- **Demonstrating the environmental benefits of transit.** Many localities and regions are creating climate action plans that identify strategies for reducing emissions. While there may not be a formal mandate for the agency in these plans, there may still be policy levers over which an agency may wish to exert influence within this context. Developing a CAP will assist agencies in evaluating, quantifying and demonstrating the regional emission reductions they can contribute, possibly even in monetizable ways. This is an opportunity to burnish public transportation's image, both to the public it serves, as well as to local, state and federal officials. This in turn can result in additional policy, programmatic and financial support for the provision of transit and supporting activities, such as transit-supportive land use policies, access to infrastructure and accommodations such as exclusive lanes and prioritization at traffic signals.
- **Improving cost-effectiveness.** Through the process of climate action planning, an agency may be able to identify and prioritize a number of activities and investments that have the potential to reduce its GHG emissions while also saving the agency money in the short and long term. This can derive both directly from the lowered costs associated with reduced energy consumption and indirectly as a result of addressing carbon regulation or participating in carbon markets. By making operational decisions and capital investments that cost-effectively reduce emissions in a technically and politically feasible way, agencies can often recoup their costs of over the life of those investments. When there is a price associated with GHG emissions, a CAP can help an agency reduce the cost of regulatory compliance or take advantage of market opportunities to raise revenue from emission reductions. Additionally, it helps to prepare agencies to compete for a variety of emerging funding opportunities, including foundation grants and those established by the federal TIGGER and TIGER programs among others.
- **Supporting internal sustainability efforts.** As part of their sustainability efforts, many transit agencies have goals to reduce greenhouse gas emissions, both from their own operations and from the wider community in which they operate. Climate action planning can help ensure that the actions the agency pursues to meet these goals are prioritized by technical and political feasibility, GHG reduction benefits and lifecycle cost efficiency, along with other potential benefits. It can also help ensure that the agency's climate action strategies are aligned with the agency's other strategic priorities, while being integrated with the priorities of the locality, region or state where it operates.
- **Demonstrating leadership.** By developing a climate action plan, an agency can be seen as a leading force for advancing sustainability goals in its region, as well as throughout the transit

[1] Federal Transit Administration, www.fta.dot.gov/documents/PublicTransportationsRoleInRespondingToClimateChange2010.pdf
[2] NY Metropolitan Transportation Authority (MTA), www.mta.info/sustainability/pdf/MTA%20Carbon%20Model%20Report%20&%20Presentation.pdf

industry. One key channel through which to demonstrate this leadership is the APTA Sustainability Commitment, which recognizes both the development of a CAP and agency and regional emission reductions in its structure.

- **Preparing for the effects of climate change.** Climate action planning will also help agencies prepare for the potential impacts of climate change on their capital projects and operations, including an increase in the number of high-temperature days, storm frequency and severity, and sea level rise in coastal areas. Understanding the potential of these changes and planning accordingly can help agencies reduce future costs of adaptation while ensuring their ability to continue to provide service.

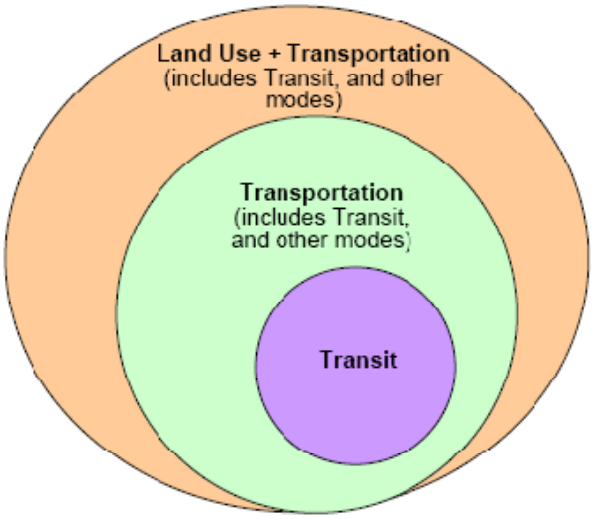
This document provides guidance on how to approach climate action planning, including how to conduct a CAP, in ways that will help agencies advance their key strategic objectives.

1.2 Scoping a climate action plan

While this document will identify core concepts and process steps that are fundamental to the success of any climate action planning effort, each planning effort will be as unique as the organization undertaking it. As with conducting a GHG footprint analysis, a key step in climate action planning is identifying the scope that the plan is intended to cover.

The scope of an agency's climate action planning efforts is primarily determined by the scope of the organization's operational authority and jurisdictional boundaries. There is substantial diversity in the nature of this authority and these boundaries within the transit industry. For example, some agencies are solely responsible for the provision of one or more modes of transit service within their service districts, while others are multimodal, multifunctional agencies with authority extending to other transportation modes, including development, operation and maintenance of the entire transportation system. In some cases, such as with SFMTA, an agency's authority can extend even beyond modal operations to other responsibilities, such as parking policy and enforcement. Some agencies may have service areas that overlap with other transit operators, even as there are transit agencies serving single cities, large regions and entire states. Interactions with other political jurisdictions can impact the scope of climate action planning, particularly as the agency evaluates the landscape of potential policy mandates or other drivers for climate action planning that may be influenced by these entities. **Figure 1** illustrates how the differences in agency authority and jurisdiction can help transit agencies determine the type and scale of GHG emission reduction and climate adaptation strategies that should be considered during the planning process.

FIGURE 1
What Authority Does the Agency Have?



Considering this diversity within the industry, it is helpful to think of two basic scales at which transit agencies can undertake climate action planning:

- Reducing emissions from their own internal operations and facilities; and
- Reducing emissions from the transportation sector at a regional scale through agency operations and regionally coordinated transportation and/or land use strategies.

While all transit agencies can decide to set targets for reducing their own institutional emissions, their ability and inclination to make commitments to regional transportation sector emission reductions will depend on the context in which they are operating. For the few agencies that have authority over transportation sector-wide decisions (or, more rarely, can exert land use power), the agency's plan could identify actions and strategies with direct effect on those policy levers.

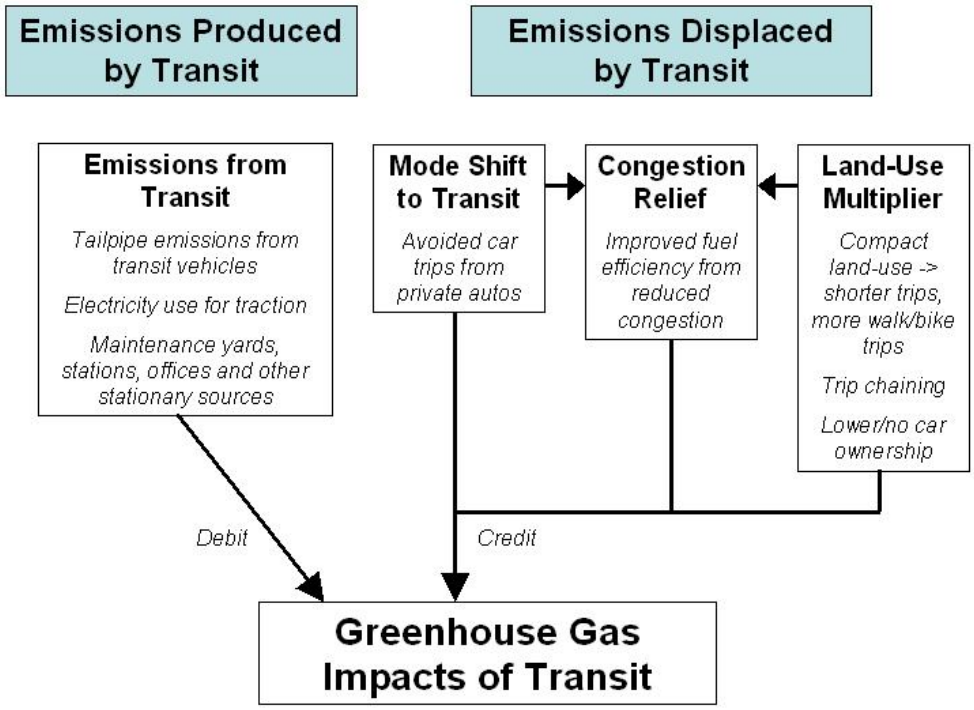
However, for most transit agencies, the focus will be on shaping climate policy outcomes. Through their interactions with other actors under whose authority other relevant strategies and potentially allocation of reduction targets are being set, agencies can seek to influence these policy decisions, including regional target

setting or other climate planning, land use and development. In this case, the planning process (and even the plan itself) can focus on demonstrating the role that transit can play in helping to deliver emission reductions and identifying the resources, partnerships and supporting policies needed to achieve these goals. This latter point is critical, since transit's success in this regard can depend heavily upon policy support from its local, regional and state jurisdictional partners, especially transit-supportive land use policies. Effective stakeholder engagement and partnership development can be essential to securing this support.

In terms of reducing their internal footprint (the first of these scales), agencies can focus on improving fleet fuel economy and undertaking other energy-efficiency measures in agency operations and facilities, along with shifting to lower-carbon fuels and energy supplies. They can also incorporate green building and construction principles and practices in the development of their capital projects.

As discussed in the APTA *Recommended Practice* "Quantifying Greenhouse Gas Emissions from Transit," there are a number of ways agencies can help to "displace" regional transportation sector emissions, including shifting users from less carbon-efficient modes to transit, reducing congestion and its associated emissions, and enabling more compact development patterns, which allow for shorter and fewer vehicular trips to be made. As illustrated in **Figure 2**, this displacement can be thought of as a "credit" on a ledger, while the emissions produced by transit operations and facilities can be thought of as a "debit."

FIGURE 2
Greenhouse Gas "Credits" and "Debits"

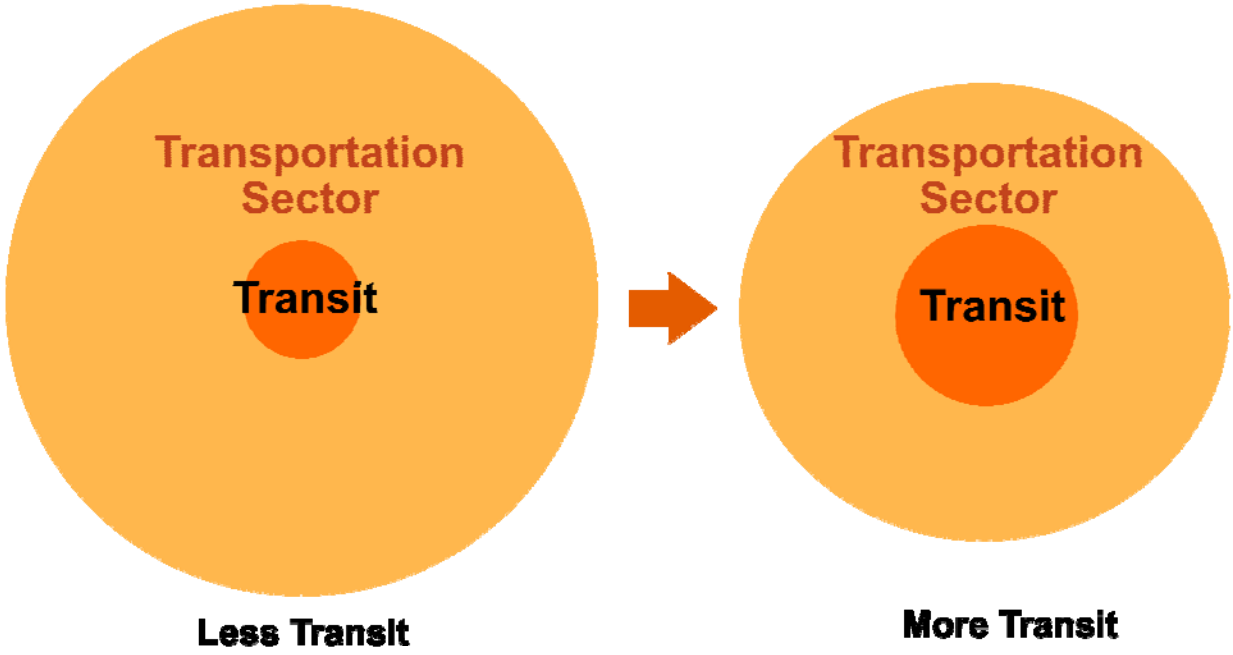


A central scoping decision for agencies engaging in climate action planning is determining which of these two scales they are seeking to address through their planning. For those agencies undertaking climate action planning as a result of a policy mandate, this is usually decided for them. For those agencies defining their own scope as a means of pursuing strategic objectives, they have a choice about whether to include both scales in their planning objectives or to focus on one.

NOTE: A third scoping consideration is the effect of greenhouse gas emissions and climate change on transit. For example, sea level rise can pose threats to infrastructure in low-lying areas. Changing weather patterns and more intense storms could affect power supply or route availability. Rising temperatures may have implications with regard to equipment and its design. While transit agencies may have different degrees of vulnerability, defining this vulnerability and planning how to avoid or mitigate the most egregious concerns is also appropriate when initiating a climate action plan. Climate adaptation is still an emerging area of study with regard to transportation planning in general and with regard to transit in particular. Recognizing its importance, the APTA Climate Change Standards Working Group intends to make climate adaptation an area of future focus for its work. As more agencies engage in adaptation planning and state and federal approaches are refined, future iterations of this document and other working group products will provide more extensive guidance in this area.

This responsibility to consider whether and how they can reduce emissions on both of these scales is a unique attribute of the scope of climate action planning efforts by transit agencies. Balancing these two responsibilities can be tricky and at times even in tension. As **Figure 3** illustrates, expansion actions taken by agencies to expand service and support mode shift, reduce congestion and support compact development to reduce transportation sector emissions at a regional scale can actually increase transit agency emissions on an absolute basis.

FIGURE 3
Transit's Effects on Emissions



One way to address this potential paradox is to focus on the efficiency (or "carbon intensity") of an agency's footprint. In this way, an agency may be able to act on both scales and advance the dual goals of displacing transportation sector emissions through its operations — i.e., increasing its "credit," while also reducing the intensity of its own operational emissions (minimizing its "debit" on a normalized basis). Being able to demonstrate that it is both contributing to regional emissions reductions goals and being a good steward by improving its own emissions performance can help to increase the financial and policy support for the agency. The extent to which this is possible will depend on the relative productivity of the new service compared with that which is already being provided. For example, lower productivity service may result in higher emissions from agency operations on both an absolute and normalized basis. However, that service is likely to still

reduce regional transportation sector emissions through the three "credit" pathways identified above. This underscores the importance of considering both the "credit" and "debit" sides of transit's "climate ledger."

Two final considerations that inform the scope of climate action planning are related to cost. First, it is important to know upfront whether the agency will seek third-party verification of its climate emissions and reductions and publicly report this information. If so, this could have implications for the planning process, including schedule and costs. Agencies will experience higher costs and policy requirements due to stricter data standards and expanded communications associated with verification and reporting, both of which can also extend the planning schedule, further increasing costs. However, verified data lend significant credibility to an agency's reporting, which could garner added support from external stakeholders and improve the likelihood of securing funding on the basis of these data and reports.

The agency should consult with stakeholders to see if verification makes sense for its planning process. While such a decision may be voluntary at this point, readers should be aware that some future regulatory programs could require third-part verification. Currently, the California mandatory reporting rule (although not currently applicable to transit agencies) does require third-party verification of emissions. Also, some voluntary reporting programs, such as The Climate Registry, require third-party verification of emissions if data is to be publicly reported. If an organization is planning on participating in one of these programs, then including third-party verification in the scope of the planning process is advisable.

Similarly, an agency should also determine whether its state's environmental regulations require formal environmental review of the CAP document, as this can also add to cost and complexity. For example, in California, amendments to the California Environmental Quality Act (CEQA) providing guidelines for addressing GHGs were just finalized under the authority of SB 97. Even before these guidelines were finalized, the cities of Berkeley and San Carlos performed CEQA analyses on their plans before adoption.

1.3 Shaping a climate action plan

In addition to being scoped to reflect an agency's authority and jurisdiction, the content of a CAP also needs to be designed with the agency's internal organizational context in mind. In order to develop a successful plan for an organization, it is important to shape the plan to fit the organization's needs and according to its capacity to meet those needs. A viable work plan will recognize the extent to which climate action is supported, either directly or indirectly, by an organization's strategic objectives, culture, and human and financial resources.

With this in mind, this *Recommended Practice* is intended to be interpreted with flexibility, so that agencies can tailor their planning effort to meet their organizations' unique needs. This guide identifies a core four-step process consistent with the Plan-Do-Check-Act framework used in environmental management systems (EMS). While this core process should be followed through its entirety to ensure that the appropriate feedback loops are created, an agency may initially want to undertake only some of the elements within each of the steps, based on the organization's priorities and capacity. This type of segmentation can apply to the range of analytic methods suggested in this document, recognizing that not all planning efforts will require the same level of analytic sophistication to be successful.

1.4 Partnerships are essential

Regardless of the scope and shape of an agency's climate action planning efforts, it must effectively partner with internal and external stakeholders. These stakeholders will ensure that the climate action planning strategies are designed and implemented to achieve success. Identification and engagement of stakeholders needs to happen at the beginning of the planning process, and these partnerships need to be nurtured and leveraged throughout the planning process and implementation of the plan. Given the importance of

partnerships, this document provides detailed suggestions about how to conduct effective stakeholder engagement in support of successful climate action planning.

1.5 Document structure

This document is structured around the following four-step process, which serves as the core conceptual framework of this guideline:

1. **Strategic planning:** Defining the vision, goals and objectives, including the scope and scale of the planning effort, along with an initial estimate of the human, financial and data resources needed to develop, implement and evaluate programs and projects identified in the plan.
2. **Options analysis:** Identifying feasible and suitable strategies and supporting actions reflective of the agency's context to reduce emissions and achieve co-benefits, aligned with the plan's vision, goals and objectives.
3. **Implementation:** Enacting the plan.
4. **Monitoring and improvement:** Establishing feedback loops to assess and improve performance, including an assessment and adjustment of the necessary human, financial and data resources.

As with the Plan-Do-Check-Act framework used in EMS, these steps are to be pursued in a cycle, with the results of the monitoring and improvement phase informing the next round of strategic planning to support the pursuit of continuous improvement (as illustrated in **Figure 4**).

FIGURE 4
The Plan-Do-Check-Act Cycle

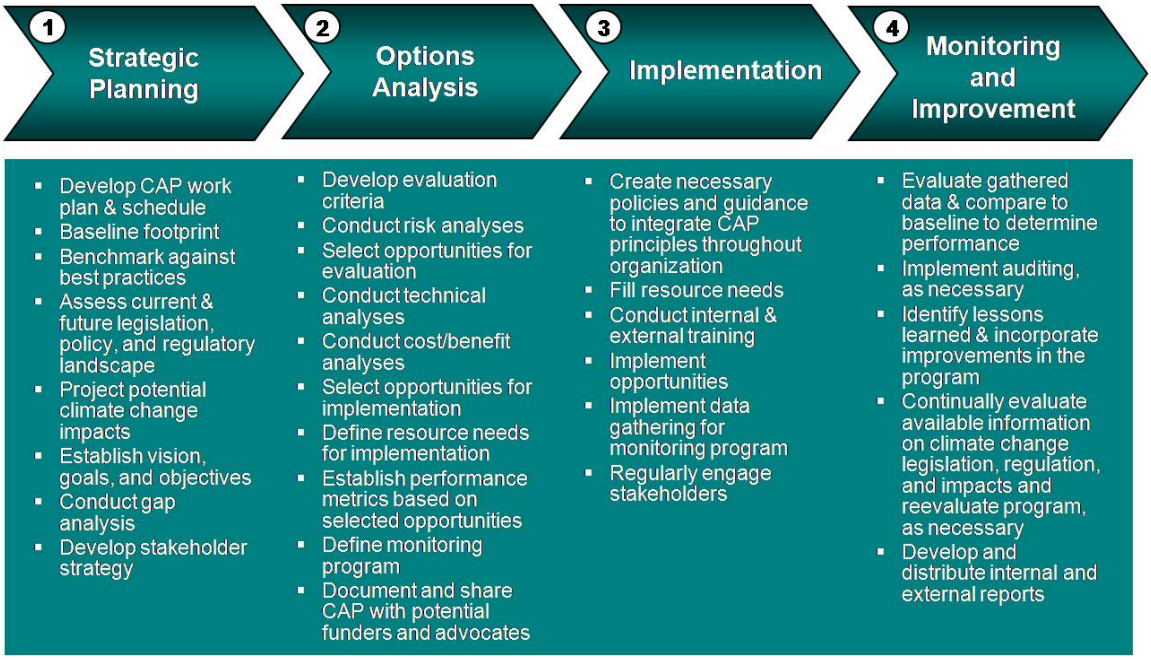
Section 2 of this document provides an overview of this four-step approach, while Section 3 walks through each of the phases in greater detail. Section 4 summarizes major themes of this document and offers concluding thoughts. Relevant resources can be found in the References.

2. Climate action planning approach: an overview

Climate action planning can be a powerful tool to help transportation agencies identify and implement the right set of strategies to mitigate their GHG emissions, increase their GHG displacement and adapt to future climate change risks. To be successful, the approach needs to be clear and the decisions transparent. Agencies that have an EMS already have a framework through which to develop and implement a CAP. The approach described below is based on the same principles and framework as an EMS and can therefore work for agencies with or without an EMS.

The approach has four basic phases. The first two, strategic planning and options analysis, will result in developing a CAP. The second two, Implementation and Monitoring and Improvement, will ensure that the CAP achieves long-term success. **Figure 5** shows the elements that can make up each stage.

FIGURE 5
Four Phases of Climate Action Planning



These elements are not of equal value to the overall product. Some may require little or no time to complete (e.g., developing a schedule), while others will take a greater amount of time (e.g., establishing an energy or water usage baseline). Each agency will need to assess how relevant each of these is to its CAP development. The following subsections describe each phase.

2.1 Strategic planning

In this initial stage, the team creating the CAP should build its vision to address climate change, ensuring that the vision supports the agency's overall mission. It is important to establish a common vision to ensure that all stakeholders understand what major outcomes are expected with implementation of the plan. From the vision, the agency should identify goals and objectives for the CAP. In some cases, as noted in Section 1, external policy mandates will dictate goals and objectives. In other cases, policy direction from within the agency will drive goals and objectives, based on the vision that has been set.

This phase also includes baselining. Developing GHG inventories and baselines will provide the foundation for identifying what it will take to achieve goals and objectives, both in terms of absolute reductions and

intensity/performance improvements. If climate adaptation efforts are being considered within the plan, the baseline should also include those considerations. Additionally, an assessment of current best practices, for both mitigation and adaptation being implemented within the agency and by others in the industry, is useful to build a set of potential initiatives that can be evaluated to meet the goals and objectives. Those that appear to appropriately align with mission requirements and key organizational priorities are categorized by whether they would be enterprise-wide efforts or focused on specific parts of the organization, processes or media. Depending on the scope and scale of the CAP, these analyses can take a significant amount of time and resources, as they will require internal buy-in and collaboration, collaboration with external parties, and allocation of appropriate analytical resources. Furthermore, through this analysis, agencies may discover data or other analytical gaps to address.

Taking the time to identify stakeholders and creating a strategy for how they will be involved is helpful to ensuring that they are engaged as early in the process as possible and feel like a part of the development. This can help after the CAP is published by increasing the advocacy within the region for achieving the CAP objectives.

2.2 Options analysis

This is the feasibility and suitability phase, when the strategies identified as being potentially valuable in the strategic planning analysis are evaluated against feasibility factors to determine whether they have a strong business case and will be supported by stakeholders. Typically, each agency has guidelines for determining cost-benefit analysis that may include life-cycle cost, return on investment (ROI), simple payback and cost-benefit ratios for the financial analysis, and other qualitative factors to be considered. A consistent analysis should be used across all initiatives being evaluated. For each initiative selected, a monitoring plan should be described to support future data gathering and reporting. At this point, a CAP can be documented.

2.3 Implementation

This phase includes acting on the CAP and putting into place the initiatives and associated data-gathering programs to evaluate performance over time.

2.4 Monitoring and improvement

This phase entails several interrelated activities to assess CAP performance:

- Identify lessons learned for future application;
- Report to stakeholders to promote advocacy, accountability and transparency; and
- Conduct management reviews to determine the appropriateness, relevance and suitability of sustainability initiatives for ongoing improvement.

This phase can include audits or other performance assessments, lessons learned, after-action reviews, internal and external reporting and management review.

The importance of partnership: An example from Chicago

In 2008 the city of Chicago published the Chicago Climate Action Plan (CCAP), which outlines a comprehensive approach to reduce greenhouse gas emissions within the city. The CCAP set citywide goals for reducing emissions by an 80 percent reduction below 1990 levels, with a midterm goal of 25 percent reduction by 2020 across city sectors. CCAP includes a series of transportation-sector reduction strategies, many of which are related to public transit, including increasing ridership by 30 percent and improving vehicle fuel efficiency.

With the important role that public transit will play in the solution to impending climate change impacts, the Regional Transportation Authority (RTA) is coordinating the development of the Regional Green Transit Plan (RGTP), a climate action and sustainability plan for the northeastern Illinois region's public transit system. The reasons for developing the RGTP include supporting the goals and objectives of CCAP and expanding the planning of transit's role as part of a regional climate change solution.

As the agency responsible for regional transit planning and oversight, but not direct transit operations, the RTA has convened a working group of representatives from the region's transit operators (Chicago Transit Authority, Metra and Pace), the state DOT, the region's MPO and two city of Chicago departments (Transportation and Environment) to steer the RGTP. The working group is responsible for collecting GHG inventory data, identifying the RGTP vision and goals and recommending climate mitigation and adaptation strategies for implementation.

Leveraging existing partnerships, and developing new ones, have been critical to the development of the RGTP. The working group structure has brought together agencies that develop and promote policies at the state, regional and local scales with those agencies that will be tasked to implement the plan, resulting in a plan that is both aspirational and pragmatic. By providing all parties with a level of ownership, the RGTP is positioned to serve a key role in improving public transit's role in regional climate change mitigation and adaptation.

3. Process

3.1 Strategic planning

This section provides guidance in setting emissions targets, incorporating local goals and applying targets for transit agencies. It also provides guidance on making public comments on proposed rules concerning emissions.

3.1.1 Stakeholder strategy

One of the keys to the successful development of a CAP is to engage stakeholders throughout the climate action planning process, from the initial scoping of the CAP through implementation and monitoring. The term "stakeholders" can be defined in many ways, and in the development of a CAP, there are two major classes of stakeholders: internal and external. Once the stakeholders have been identified, it is important to keep them engaged over time and to leverage their expertise and capabilities in a mutually beneficial manner, such as exemplified in a current climate action planning process in the greater Chicago area (see sidebar).

There are numerous strategies to engage stakeholders in developing climate action plans. Resources that describe some of these strategies are included in the References section. No matter which strategy an agency chooses, it is critical to engage individual stakeholders who are knowledgeable and open-minded and will lend credibility to the CAP.

The internal stakeholders are generally employees of the transit agency or agencies for whom the plan is being developed. It is recommended that an internal team (or working group) be convened to steer the development of the plan. This team should consist of employees from the main departments that will be impacted by the plan's recommendations, as determined by the scope of the plan. It is best to work internally at multiple levels, including executives, midlevel managers and front-line employees. It is also recommended to engage the board of directors or equivalent authority to ensure support for the plan. The members of the internal team also will be responsible for engaging employees in other agency departments at appropriate times throughout plan development and implementation.

The external stakeholders related to climate action planning fall into two categories: regional partners and advocates. The regional partners include other public agencies in the regional transit agency's service area that implement, regulate or fund programs and projects related to the focus areas of the CAP. These partners may include metropolitan planning

organizations (MPOs), state and city departments of transportation, other transit agencies, state or local housing and development authorities, environmental regulators and water management districts. These stakeholders bear the responsibility for ensuring that the plan is developed so that it is consistent with other plans and initiatives being developed and implemented in the region.

The other set of external stakeholders, advocates for the development and implementation of the plan, include nonprofit organizations, academics and the general public. Engaging the advocacy stakeholders should be done in a manner that allows for constructive conversation and debate. It is important early in the process for the lead agency to frame the scope and scale of the planning process and to secure agreement on those parameters from its stakeholders, so that all stakeholders are working toward a shared vision with an agreed-upon process for developing the plan based on majority or consensus decision making. This will ensure that a balanced plan is developed, without allowing the plan development process to be controlled by a single stakeholder. It is recommended that advocacy stakeholders have an understanding of the role of transit as a regional emissions reduction strategy and represent a geographic area that is equal to or larger than the geographic scope of the transit agency. These external stakeholders will play a key role in advocating for the necessary coordination, legislation and funding for implementing the recommendations of the CAP.

3.1.2 Existing conditions and anticipated trends

As with any planning process, it is important to begin the plan development process by getting an understanding of the existing conditions within a region as they relate to climate change. This section will discuss the areas in which an agency should document the current status and anticipated trends of climate change related initiatives within its region.

Greenhouse gas emissions

A major contributor to climate change is the emission of greenhouse gases. Through the provision of transit service, significant greenhouse gas emissions are produced. However, transit service also has the potential to reduce regional emissions. In 2009, APTA published its *Recommended Practice* "Quantifying Greenhouse Gas Emissions from Transit," which guides a transit agency through the process of conducting a greenhouse gas emissions inventory and displacement analysis. In addition to quantifying the emissions produced through the provision of transit service, the *Recommended Practice* also includes the process by which the transit agency can estimate the quantity of greenhouse gas emissions that are displaced by transit in the region from mode shift, congestion reduction and the ability of transit to support compact development. The results of the displacement analysis can be used to set the agency's baseline relative to regional GHG emissions reduction.

Best practices and benchmarking

Many transit agencies are already addressing climate change through their operations, even if it has not been framed as such. In order to build the body of best practices, it is important that agencies document any policies and practices related to climate change mitigation and adaptation that are currently being implemented. It is also helpful to gain an understanding of what actions are being undertaken by other transit agencies and stakeholders, especially to gain a sense of whether an agency is keeping up with industry best practices. These practices should cover all areas included in the plan's scope.

Programmed projects

It is important to understand what projects are currently being planned or implemented in the region that may have an impact on regional greenhouse gas emissions. These projects can include highway and transit projects, as well as major land (re)developments.

Regulatory landscape

Understanding the regulatory landscape in which an agency works is critical to the development of a climate action plan. The agency should document any existing and pending climate-related legislation and regulation at the national, state and local levels that may impact its operations. In addition, it should analyze any climate action or sustainability plans that have been adopted by organizations or agencies within the region to gain an understanding about any implications they may have on the agency. If the agency has adopted any policies related to climate change or sustainability, they also should be documented.

Projected impacts of climate change

The impacts of climate change are already being felt by transit agencies across the country, and scientific studies have predicted the impacts of climate change for each region in the country. These impacts include storm surges, flooding, pavement deterioration, additional heating and cooling requirements, and many other factors. These predictions should be included in the climate action plan, along with any climate adaptation or preparedness strategies that have been identified for implementation in the region.

Vision, goals and objectives

Establishing a vision and a corresponding set of goals and objectives for an agency's climate action planning is critical to the development of a CAP. The planning process will identify climate change mitigation and adaptation strategies. Realizing that it will not be possible to implement every strategy due to budgetary, temporal and other limitations, the vision, goals and objectives an agency sets will help create an achievable final plan that is consistent with its overall mission.

Climate change mitigation and adaptation are only parts of a transit agency's overall mission and business model. Therefore, it is imperative that the vision and goals established for a CAP build upon the overall mission and vision of the agency. Incongruous visions and goals may render the plan incapable of being implemented without compromising other critical aspects of the agency's mission.

The plan's vision, goals and objectives should be established through a collaborative process. Many agencies have facilitated visioning sessions with senior-level agency staff, the stakeholders responsible for recommending and implementing agency policies. Without their critical buy-in to the vision and goals of the CAP, successful implementation is unlikely. Involving regional partners in developing the vision and setting goals is also important, as this can help ensure regional coordination and cooperation in implementing the final plan.

During the goal-setting stage of developing a CAP, the agency should think about goals and objectives that have been set by other organizations. Some states and cities have adopted legislation or climate action plans that dictate minimum goals or standards that transit agencies must achieve. Also, organizations such as The Climate Registry and APTA (through its Sustainability Commitment) offer opportunities to receive recognition and other benefits for setting and achieving specific goals and objectives.

Vision

The vision for the CAP should paint a picture of where the agency wants to be. The vision should have a three- to seven-year timeframe, be both action- and customer-oriented, and be based on a common understanding of strategic context and future scenarios.

Goals

The goals for the CAP should identify how the vision will be realized. Goals should be broadly focused and should describe a desired future condition. The goals should be mostly qualitative and attainable within a meaningful timeframe. In addition to setting overall targets, the agency will need to identify the set of

strategies and supporting actions that will help it meet those agency-wide targets. Issues to consider while establishing targets for these goals are discussed in the following section.

Objectives

The objectives for the CAP should be quantitative and measurable with a preset date of compliance. They should clearly describe an intended outcome and support the achievement of the goals by specifying how the goals will be accomplished.

A series of performance metrics should also be established to track progress toward the goals and objectives. These metrics should include those necessary for tracking the CAP, as well as metrics related to other goals of the agency or region, in order to ensure that progress on those goals is not being sacrificed to meet climate action plan goals. For example, climate mitigation strategies should not have negative impacts on overarching agency goals related to customer satisfaction and comfort.

3.1.3 Target setting

The key issue for target setting is whether targets are set internally ("policy direction") or externally ("policy mandate"). Externally set targets generally do not address separate economic sectors, the activities of transit agencies nor emissions displaced by transit. For this reason, internally set targets can be more specific and adapted to individual circumstances while supporting the achievement of externally set targets. These targets generally have quantitative and temporal quantities. **Table 1** is a sampling of state and regional targets and illustrates the diversity of approaches and targets.

TABLE 1
Examples of State and Regional Targets

Entity	Targets	Notes and Source
California (statewide)	• 2000 levels by 2010 • 1990 levels by 2020 • 80% below 1990 by 2050	Executive Order S-3-05 (http://www.dot.ca.gov/hq/energy/ExecOrderS-3-05.htm), AB 32, SB 375
Hawaii (statewide)	• 1990 levels by 2020	Act 234 (http://hawaii.gov/dbedt/info/energy/planning/greenhouse)
Illinois (statewide)	• 1990 levels by 2020 • 60% below 1990 levels by 2050	Governor's greenhouse gas reduction goals (http://illinois.gov/PressReleases/ShowPressRelease.cfm?SubjectID=2&RecNum=5715)
Maine (statewide)	• 1990 levels by 2010 • 10% below 1990 by 2020 • 75-80% below 2003 long-term	LD 845, HP 622 (http://www.legislature.maine.gov/legis/bills_121st/LD.asp?LD=845)
Massachusetts (statewide)	• 1990 levels by 2010 • 10% below 1990 by 2020 • 75-85% below 1990 long-term	Massachusetts Climate Protection Plan of 2004 (http://www.newamerica.net/files/MAClimateProtPlan0504.pdf)
New Jersey (statewide)	• 1990 levels by 2020 • 80% below 2006 levels by 2050	Executive Order #54 (http://www.state.nj.us/infobank/circular/eojsc54.htm)
New York (statewide)	• 5% below 1990 by 2010 • 10% below 1990 by 2020	New York State Energy Plan (http://www.nyserda.org/Energy_Information/energy_state_plan.asp)

Western Climate Initiative	• 15% below 2005 levels by 2020	Emission Reduction Goal (http://www.westernclimateinitiative.org/component/remository/general/Emission-Reduction-Goal-Aug-2007/)
Regional Greenhouse Gas Initiative (CO_2 emissions from power plants)	• Cap emissions at current levels in 2009 • Reduce emissions 10% by 2019	Pew Center summary of program (http://www.pewclimate.org/what_s_being_done/in_the_states/rggi)
New England Governors and Eastern Canadian Premiers (regional economy-wide)	• 1990 levels by 2010 • 10% below 1990 by 2020 • 75-85% below 2001 long-term	Resolution Concerning Climate Change: (http://www.negc.org/02En003.html)

As **Table 1** illustrates, the selection of base year (against which reductions are to be measured) and target year (by when reductions are to be achieved) vary by state, as do the levels of targeted reduction. These targets are also economy-wide and are not specifically targeted at particular sectors, such as transportation, or modes, such as transit. Target-setting raises a number of issues that agencies should consider. These issues vary depending on whether the targets are internally or externally driven, as discussed below.

Work done by the San Francisco Municipal Transportation Authority (SFMTA) provides an example of the way in which one agency has approached setting a series of targets across a range of strategies in order to meet a mandated target for emissions reductions from the transportation sector. SFMTA has an ambitious GHG reduction goal, 20% of citywide transportation emissions below 1990 levels, as established by voters in Proposition A. To examine the progress of SFMTA and interagency projects and programs, the SFMTA has established a tracking procedure based upon a set of indicator targets, as illustrated in Table 2.

TABLE 2
Examples of Evaluation Categories and Indicator Targets

Evaluation Category	**Indicators *(local or regional transportation targets)***
Operations	• Increase in ridership *(mode share of 30%)* • Reduction in auto/non-transit VMTs *(10% reduction per capita by 2035)* • Reduced need for off-street parking • Conversion of on-street parking to transit, bicycle and pedestrian uses • Reduction in road maintenance • Shorter commute times *(all modes)*
Vehicles	• Reduce transit fleet vehicle emissions *(zero emissions by 2020)* • Increase in number of green vehicle registrations
Facilities	• Increase in energy efficiency and renewable energy *(respectively, 107 MW and 50 MW citywide)* • Provision of infrastructure to support transit and non-transit electric vehicles
Solid Waste and Recycling	• Optimization of waste reduction *(100% diversion by 2020)*
Employee Travel Demand	• Reduction in total VMTs *(at least10% reduction by 2035)*
Construction and Capital Projects	• Diversion of construction and demolition waste from landfills *(100% diversion by 2020)*

Sources: SFMTA Climate Action Plan (2009, Draft), Climate Action Plan for San Francisco (2004), The Electricity Resource Plan (2002), Transportation 2035 Plan for the San Francisco Bay Area (2009)

Similarly, when an external target has not been set or imposed, the agency will need to identify its own GHG emission reduction target. Establishing the target necessitates wide-ranging internal and external research, which synthesizes all parts of the CAP. A helpful place to start is by examining the structure and asset classes (i.e., rolling stock, facilities, stations) identified in the agency's greenhouse gas inventory. This framework can be analyzed to understand the reporting structures and performance ranges for various asset classes of the carbon footprint.

At the same time, the targets being discussed should be evaluated from the perspective of the policy context at the local, regional, state and national levels. Such top-down analysis ensures that CAP targets comply, address and leverage aspirations at these macro scales. Finally, a bottom-up validation analysis should be conducted based on the feasibility, carbon reduction potential and cost-effectiveness of various technologies, ensuring that the agency's targets are achievable. In addition to establishing such "committed" targets, the agency may want to consider identifying aspirational or "stretch" targets in the event additional resources become available.

As with previous phases, agencies should be made aware of the amount of effort required here. They will need to consider the type of analysis required, to allocate sufficient time and the appropriate resources. It may be helpful to include assessment of peer agencies' targets. However, it is incumbent on the agency to determine what are and aren't appropriate targets for their agency and region.

Internally based targets

For agencies setting their own targets, the following issues should inform their decisions:

- What data are needed? How accessible and useful are the data?
- Is base-year data available in a format that will withstand an audit? Between 1990 and today, records may have been archived, fuel vendors may no longer have records, etc. What activities will be included in targets (i.e., Scope 1, 2 and/or 3)?
- Has the transit agency changed in a significant manner or is it planning to change in the near term? This could influence the selection of the base and target year. For example, how would a transition from a diesel-based service to electric-based service impact the ability to achieve targets?
- Have there been significant changes in the economy or ridership that impact particular years? For example, 2000 was a strong economic year for many agencies, and ridership may be stable since then.
- Does the transit agency have fuel and other energy forecasts for the target year? Are fleet compositions known for the target year?

Externally based targets

If the transit agency is not in a position to set targets but still has an opportunity to influence related policy, it is important to raise the following considerations with the entities leading the target setting:

- How will targets be allocated within economic sectors? Will transportation be expected to provide reductions proportional to other sectors? Are targets allocated on a geographic basis?
- What levels of renewable resources are available and at what price? Biodiesel, for example, is not available in all regions at competitive prices.
- How will future service plans affect forecasted emissions?

Depending on the answers to these questions, an agency may reach different conclusions about whether to establish targets on an absolute and/or normalized basis.

Absolute vs. normalized targets

Transit agencies' emissions can displace private direct and indirect emissions. However, targets set at the state, regional and local levels generally do not recognize this distinction and, if applied to individual transit agencies, can impose additional costs or regulatory burden upon the agency. To try to address this risk, members of the transit industry have proposed a number of ways to measure their emissions, as laid out in the APTA *Recommended Practice* "Quantifying Greenhouse Gas Emissions from Transit." **Table 3** presents some of the issues in setting these performance metrics:

TABLE 3
Examples of Performance Metrics

Metric	Considerations
Absolute	
Direct emissions generated ("debit")	Consistent with climate science; does not measure displaced emissions.
Direct emissions displaced ("credit")	Measures net impact when combined with direct emissions generated.
Normalized	
GHG per passenger mile	Measures emission reductions due to mode shift and technology; could adjust for passenger vehicle fleet and speeds.
GHG per revenue vehicle hour	Captures efforts to reduce deadheading and roadway congestion.
GHG per revenue vehicle mile	Reflects efficiency of operations or route structures

3.2 Options analysis

This section provides guidance for identifying and evaluating various GHG emissions reduction strategies that a transit agency could implement. Building off of the existing conditions (including best practices) listed earlier, this section outlines evaluation criteria definition, development of master list of potential strategies, an initial screening process, and advancement of promising strategies for further development.

3.2.1 Options/strategies evaluation process

Step 1: Define criteria

The first step is to consider how the agency will screen, evaluate and prioritize strategies. Based on the agency's strategic plan and other relevant polices, it is important to define the evaluation criteria. For the screening stage, the agency may not have sufficient information for detailed evaluation, so the criteria have to be flexible enough to respond to available information. **Table 4** lists some key criteria to consider, divided into primary criteria and secondary criteria. The primary criteria are weighted more heavily in the screening phase.

TABLE 4
Examples of Evaluation Criteria and Considerations

Evaluation Criteria	Considerations
Primary	
GHG emissions reduction benefit	• GHG per vehicle mile, revenue mile or passenger mile
Technical feasibility	• Certainty of technical advances • Technology readiness • Ease of implementation
Costs: first and life cycle	• Upfront and life cycle capital costs • Long-term O&M costs
Secondary	
Co-benefits	• Cost savings • Reduced energy demand • Reduced criteria pollutant emissions • Public relations • Land use multiplier • Travel choices • Long-term O&M savings
Risks: adaptation and cost	• Climate resilience/adaptation • Certainty of cost estimates
Customer satisfaction (and other key agency criteria)	• Passenger crowding • Passenger comfort (temperature) • Passenger safety and security

Step 2: Identify potential strategies

The next step is to assemble a master list of potential GHG reduction strategies, in line with your vision, goals and objectives. Departments within your agency may already be considering or implementing cost- or energy-savings strategies. By working with your internal agency working group, consider existing agency initiatives through the lens of GHG emission reduction. Reach deep within your agency to collect a broad list of potential strategies to reduce emissions. For many agencies, it may be best to frame the effort around identifying cost-savings or energy-reduction measures. Once an internal list of potential strategies has been organized, this can be merged with findings from the existing conditions and best practices tasks identified in Section 3.1, Strategic planning. It is helpful to learn from other transit agencies or sectors. As possible, identify the potential strategy, along with any available cost-benefit information.

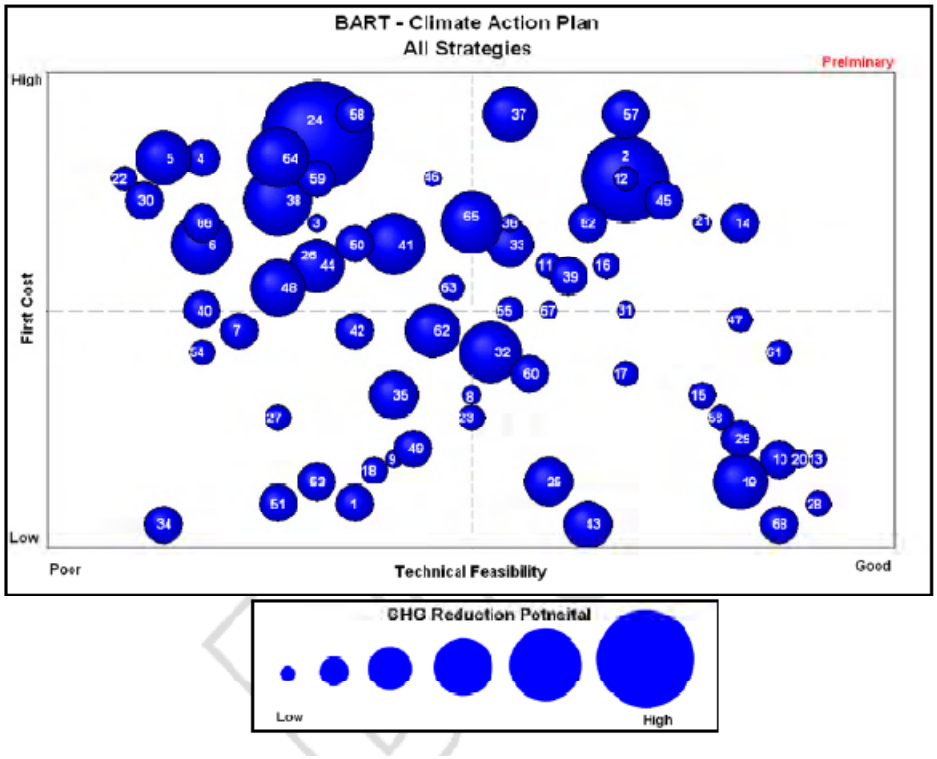
Step 3: Screen strategies

The next step is to assess all the potential GHG emission reduction strategies using the evaluation criteria. The purpose of this task is to screen down to the most promising strategies. The agency will want to consider, and advance, those “easy win” type actions that are both low-cost and technically feasible, even if they do not produce major emissions reductions. One way that many CAPs approach this is to assign timelines to strategies and supporting actions, such as those that can be done in the short term (easy win), those that can be done in a medium timeframe and those that may be longer term (e.g., 10 years or more). In addition, it is important to identify strategically important strategies and supporting actions that need further technical development, funding, stakeholder and/or political support, but that could have significant GHG reduction benefits and other co-benefits. It is also important to consider that there can be strategies and supporting actions that are necessary to allow other strategies to be undertaken. For example, regulations can provide barriers to action. Working to change such regulations could be part of a CAP. These types of strategies can

be considered “capacity-building” rather than “direct” actions that result in displaced community emissions or a reduction in direct emissions from agency operations.

It can be helpful to use graphical tools to illustrate how the strategies perform, at least when evaluated using the primary criteria. **Figure 6** plots three parameters, illustrating potential strategies under consideration by Bay Area Rapid Transit (BART). The X-axis identifies technical feasibility (from “poor” to “easy”), while the Y-axis portrays “first cost” need for implementation. The size of each bubble illustrates the potential GHG reduction benefit. This particular graphic does not illustrate life-cycle costs, but it is helpful in understanding implementation barriers presented when first-costs are significant. It could easily be adapted using life-cycle costs along the Y-axis.

FIGURE 6
A Visual Way to Evaluate Strategies



Source: BART

Step 4: Detailed strategy development

Once the agency has selected the most promising strategies, it is helpful to develop and refine these strategies in more detail to better understand their technical feasibility, costs and benefits, including the set of supporting actions that may be needed to implement a strategy. This has to be developed within the agency’s existing budget limitations. The agency will want to estimate its projected emissions reduction due to implementation of the recommended strategies. It will also be helpful to identify the potential costs. This applies to internal emission reduction strategies, as well as community emission displacement strategies. The horizon year is a central consideration that will affect the life-cycle assessment of the benefits and costs of these strategies.

Step 5: Identify recommended strategies and implementation program

Based on the additional development and analysis of the screened strategies, select the top priority strategies that will support the plan's targets and goals. For operating strategies, look for opportunities for a demonstration program to better understand implementation issues and quantify potential benefits. For capital improvements, consider how individual strategies can be phased within the context of the agency's overall capital investment program. The recommendations should consider short-term strategies that are feasible and can be advanced for funding and implementation right away, as well as medium- and long-term investments that are strategically important but need further research and development and/or political or stakeholder support.

As another phasing example, consider the agency's fleet replacement schedule, or scheduled upgrade of the vehicle washing facility. How can GHG emissions reductions be considered within the implementation cycle for each of the investments? The analysis needs to take the capital improvement plan schedule into consideration as the agency evaluates technical feasibility, phasing and costs.

Identifying funding for the implementation of the recommended strategies from the CAP can be difficult. Often transit agencies are hesitant to use scarce existing capital and operating resources to fund climate change mitigation and adaptation strategies. Therefore, it may be helpful to identify funding opportunities that are specific to climate change mitigation strategies and are not eligible to be used for regular transit capital or operations. These funding opportunities can come from environmental programs at traditional transit funding sources (e.g., the FTA or state DOTs) or from "nontraditional" funding sources (e.g., federal and state environmental and energy agencies or private foundations) that have an interest in addressing climate change. However, funding for transit investments and operations is challenging even in the best of times. Alternatively, there may be existing agency interests or goals that are consistent with climate action, but were never identified as such. In such cases, the CAP could add additional support of these actions. Agencies engaged in climate action planning have used new funding opportunities to achieve such low-hanging fruit by pursuing strategies in a variety of areas (see sidebar).

In many cases, it can be best to lead implementation with the "easy wins" that have low investment costs and quick payback periods. For electric power, consider emerging state-level requirements for utilities to transition toward greener power

Climate action strategies as cost-saving measures

King Country Metro Transit is using Qualified Energy Conservation Bonds (QECB) to finance investments in new technologies to reduce GHGs and to achieve energy savings from the HVAC system at its North Base facility. North Base serves more than 250 transit vehicles with more than 14,000 square feet of office space and 33,000 square feet of vehicle maintenance. The new HVAC system serving the office space features cutting-edge variable refrigerant flow (VRF) technology, which is estimated to reduce energy use by 33 percent and has lower capital cost than traditional technology.

King County Metro has also installed a hydronic heat recovery system to serve vehicle maintenance, which is estimated to use 17 percent less energy compared with conventional technology. The system's computerized control system replaces only the amount of fresh air needed to maintain air quality based on system-run tests, reducing energy use for heating.

The Los Angeles County MTA (Metro) has undertaken or recently considered a number of initiatives that will both reduce energy use, agency carbon footprint, and most importantly operations costs. A recently completed report entitled "Greenhouse Gas Emissions Cost Effectiveness Study" summarizes and analyzes these initiatives. Some of the strategies that have been considered for cost-effectively reducing emissions and costs include:

- Recycled water for bus washing;
- Low water sanitary fixtures;
- Red line tunnel lighting retrofits;
- Transit-oriented development;
- Facility lighting efficiency;
- On-board railcar energy storage;
- and Vanpool subsidy.

Information presented in Metro's recently completed Water Action Plan and soon to be developed Energy Conservation and Management Plan complement the overarching results of the Cost Effectiveness Study. Copies of Metro's completed and future reports can be downloaded from www.metro.net/sustainability.

supplies (renewable portfolio standards); performance contracting agreements with private energy services companies that could be used to identify, fund and implement energy efficiency measures; and power purchase agreements in which a private green-power provider obtains the tax benefits of green-power investments and provides long-term power at a stable price to the public transit agency.

3.2.2 Define milestones and monitoring program

The milestones established for the CAP should be based on the implementation plan. The planning process should provide some initial consideration of how the agency intends to define milestones and to monitor performance over time. The implementation schedule should define milestones based on potential phasing of strategies. The milestones should be closely coordinated with the agency capital improvement program and available funding for operations and maintenance.

A monitoring program should be established to track the agency's progress on meeting the vision and goals of the CAP. It is important that the monitoring plan is based on meaningful performance measures for which the agency can collect the necessary data. It is also important to make sure that the agency dedicates the necessary resources and establishes procedures to implement the monitoring program. This involves identifying the appropriate staff to coordinate the monitoring program and establishing the processes and procedures for collecting the necessary data. This will be discussed in more detail below, but it is important to understand up front what data are available, where there are data gaps, and potential opportunities for improving data collection and use.

3.2.3 Document and share the CAP

Having emerged from the options analysis with milestones defined and a performance monitoring program set up to track various phases of strategies over time, it is now time to document the CAP and ensure internal and external stakeholder support for the written plan. As with rolling out any planning process, the first step in implementing a CAP is to develop the document that will capture decisions made during the strategic planning and options analysis stages and then direct work throughout the organization in support of those decisions. It is important to start with a draft document in order to continue soliciting feedback from the stakeholders identified at the beginning of the process. Having representative and engaged stakeholders throughout the organization and within the community is fundamental to the success of implementing a CAP. While having buy-in from a diverse set of stakeholders is important, it is also essential that support for implementing the CAP extend to the highest levels of agency leadership. Ideally, the CAP should be adopted by the transit agency board or comparable authority.

3.3 Implementation

With an adopted and supported CAP document in hand, it is now time to move on to implementation. While each organization may have its own formal processes in place through which it must implement a program or product, the following steps are helpful to consider when commencing implementation.

3.3.1 Create necessary policies and guidance to integrate CAP principles into agency behavior

As noted in the previous section, it is important that leadership approve of the draft CAP document before the agency begins circulating the document and assigning tasks. The adoption of the CAP provides the necessary authority and support to create the policies and provide the guidance needed to implement the plan. It is important that the proper guidance is provided across the organization to ensure proper integration of the CAP into the everyday work of agency departments. Ideally, these policy changes should be identified during the strategic planning phase so that they can be presented as part of the draft plan, but it may be that some of these needed changes become evident only as the agency conducts its internal review and preparatory action for adoption.

3.3.2 Fill resource needs

The adoption of the CAP may mean that additional responsibilities related to implementation or monitoring may be charged to specific agency departments, necessitating additional resources (i.e., staff, tools, funding). It is critical to fill identified resource needs as soon as possible, in order to not fall behind on the plan's implementation schedule. As with policy changes, the need for restructuring or additional hiring should ideally be identified when the initiatives for implementation are agreed on and accounted for as part of the life-cycle cost analysis within the CAP. This will indicate what funding is needed, not only for implementation, but also for monitoring, and should help the agency determine whether it has the resources in house to fully implement the plan or if it needs to bring on additional resources.

3.3.3 Conduct internal and external training

Even if hiring or restructuring aren't necessary, successfully implementing the CAP will often require additional training for internal and external stakeholders. Agencies should identify the skills that will be needed to implement the strategies identified in the CAP, as well as to monitor the performance of those strategies. Once the teams have been assembled, agencies should do an assessment of the skills still needed and in which its staff can be trained. This step may identify some skill gaps that will need to be filled through additional hiring or restructuring.

3.3.4 Implement opportunities

In order to generate momentum in support of the plan, agencies should begin to implement the promising strategies identified during the options analysis. As noted above, they may want to start out with some "easy wins" — strategies with relatively low risk-reward and with low barriers to implementation — in order to build team morale and to resolve any issues that may occur as a result of staff taking on new roles or structures. Starting with "easy wins" could also help bolster the credibility of the plan and the agency as a whole.

3.3.5 Implement data gathering for monitoring and evaluation program

As the agency begins to implement strategies, it will need to have resources for data gathering and analysis in place. For this reason, it is important to understand up front what data are available, where there are data gaps, and potential data-gathering improvement actions. As data are collected and analyzed, agencies should engage in the evaluation process and share the results with the appropriate teams of stakeholders.

3.3.6 Regularly engage stakeholders

While moving through the implementation steps above, agencies should maintain engagement with their internal and external stakeholders. This will help to bolster the sense of ownership and commitment felt by stakeholders. In particular, this is the time to leverage stakeholders' support for implementation, including potential funding, coordination and supportive policy/legislative changes external to the agency.

3.4 Monitoring and improvement

As with an EMS or other Plan-Do-Check-Act management systems, monitoring performance and taking corrective action is an essential step to identify opportunities for improvement and to ensure that the agency meets its adopted goals. The following approaches offer a systematic way to ensure that the agency benefits from this crucial step.

3.4.1 Audits and performance assessments

Routine, systematic assessments of accomplishments and progress toward established objectives and targets provide essential input on the effectiveness of program performance. Organizations employ a combination of

leading and lagging indicators to assess tactical accomplishments, as well as overall management effectiveness in minimizing negative impacts.

3.4.2 Lessons learned and after-action reviews

Building on the outputs of audits and performance assessments, lessons learned and after-action reviews provide valuable information about both positive and negative performance. Frequently, these activities yield insights into internal best management practices and successful operating models that can be further leveraged across the enterprise.

3.4.3 Internal and external reporting

Internal reporting of sustainability successes and performance stimulates accountability, promotes healthy competition among peer organizations, and feeds program momentum. Best-in-class reporting processes emphasize transparency, timely data capture and dissemination to internal organizations, and the use of technology tools to ensure efficient and accurate information exchange.

With growing stakeholder scrutiny of agency performance in fulfilling legal and regulatory mandates or self-determined objectives, organizations should consider complementing internal reporting with formal external reports and outreach communications. Agencies may wish to consider joining The Climate Registry or another reporting system to assist with this reporting effort. Participation in such a registry can provide technical assistance, facilitate benchmarking and demonstrate transparency and accountability. Participating in such a visible, respected and rigorous reporting body can also lend immense credibility to the effort through independent validation and verification, while also creating incentives for the agency to continue making progress. Agencies engaging in these bodies are also encouraged to actively seek to inform their practices about unique attributes of transit that deserve recognition in reporting and verification practices. This has the potential to be a capacity-building strategy for other agency actions. For example, The Climate Registry's recently adopted Performance Metrics for Transit Agencies recognize that carbon intensity is an appropriate measurement technique for transit agencies to use and provides a standardized method for doing so. This in turn can help position agencies to use such metrics to demonstrate their emission-reduction benefits in the context of climate action planning.

3.4.4 Management review and recalibration

While many organizations collect performance data, those that excel translate these inputs into discrete actions to build institutional capability, to instill corrective and preventive actions, and to promote continual improvement. The value of this activity is not simply in the individual management review, typically conducted annually, but instead in management's engagement and the institution's commitment to create a culture of excellence using these reviews as a starting point. By leveraging past successes and overcoming performance deficiencies through periodic review and recalibration of climate action planning and strategic goals, organizations can more effectively promote and integrate climate action to ensure ongoing mission value.

4. Conclusions

This guidance has presented a number of reasons why agencies should undertake climate action planning, laid out a framework for approaching such planning, and shared a number of considerations to keep in mind as an agency goes through the planning process.

Climate action planning offers agencies the opportunity to identify potential cost savings though resource conservation or investments in more energy-efficient technologies. It also enables agencies to measure and communicate their regional GHG reductions and other co-benefits, which can in turn set them up for success in securing funding and policy support. By building off of the Plan-Do-Check-Act framework used in EMS, the planning approach this document provides is a tried and true process whose logical flow will make it easier to demonstrate to stakeholders the validity of the effort and enhance its credibility. The approach also helps agencies prioritize investments and other actions on the basis of self-defined evaluation criteria, which can help ensure that the plan supports the agency's other strategic objectives. Unlike other planning efforts, climate action planning will specifically help agencies prepare for and anticipate carbon costs and incorporate them into project cost evaluation where appropriate.

As agencies go through this process, some key considerations should be kept in mind. While the basic approach laid out in this document should work for all agencies, the planning process should be tailored to the agency's particular needs, context and resources. As the agency defines the scope of its planning efforts, it is important to differentiate where the agency has control versus where it could/should have influence, while making sure the plan is aligned with state/regional/local regulatory and policy landscape. As an agency designs and implement its plan, it should think about whom it needs to engage internally to ensure success and identify where partnerships can be built to help further its goals beyond what it could do independently.

Finally, agencies should recognize that climate action planning is an ongoing process of adjustment between the demands of an ever-shifting political landscape and the constraints and opportunities presented by an organization's resources and strategic objectives. Whether in response to an external mandate or an internal choice, climate action planning can help agencies make wise choices that will position them well for the uncertainty of a changing climate.

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Abbreviations and acronyms

APTA	American Public Transportation Association
BART	San Francisco Bay Area Rapid Transit
CAP	climate action plan
CCAP	Chicago Climate Action Plan
CNG	compressed natural gas
DOT	Department of Transportation
EMS	environmental management systems
GHG	greenhouse gas
HVAC	heating, ventilation and air conditioning
MPO	Metropolitan Planning Organization
NEPA	National Environmental Protection Act
O&M	operations and maintenance
ROI	return on investment
RGTP	Regional Green Transit Plan
RTA	Regional Transportation Authority
SFMTA	San Francisco Municipal Transportation Authority
TIGER	Transportation Investment Generating Economic Recovery
TIGGER	Transit Investments in Greenhouse Gas and Energy Reduction
VMT	vehicle miles traveled
VRF	variable refrigerant flow