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Metropolitan Transportation
Authority
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Los Angeles, CA

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EXECUTIVE MANAGEMENT COMMITTEE
JULY 18, 2019

SUBJECT: METRO CLIMATE ACTION AND ADAPTATION PLAN

ACTION: ADOPT PLAN

RECOMMENDATION

ADOPT the Metro Climate Action and Adaptation Plan.

ISSUE

In 2012, the Los Angeles County Metropolitan Transportation Authority (Metro) released the Climate Action and Adaptation Plan (CAAP), establishing a framework for reducing greenhouse gas emissions and building the agency's resilience to the effects of climate change. The 2012 CAAP needs to be updated to reflect the current state of science and policy regulations and to conform to LA Metro's commitments under Measure R, Measure M and acceleration of the completion of 28 projects by 2028.

BACKGROUND

Metro's 2012 CAAP established a framework for reducing our greenhouse gas emissions and building resilience to minimize the impacts of climate change. Metro has worked to embed climate action into systems, assets and operations to create a resilient and forward-thinking Agency prepared for a changing future since 2012.

Metro is at the forefront of implementing visionary climate impact reducing strategies. Our projects and activities have been cited in recommended practice and best practice reports produced by the American Public Transportation Association, the Transportation Research Board, and most recently by the State of California in the report *Paying It Forward: The Path Toward Climate-Safe Infrastructure In California* <http://resources.ca.gov/climate/climate-safe-infrastructure-working-group/>). Metro staff has been actively involved in all of these activities. ***But these are not enough.***
Metro has accomplished much in climate impact reducing programs and infrastructure since the 2012 CAAP was released. Staff believes that more ambitious goals for the near and long term developed through this 2012 CAAP update process will ensure that the assets we currently have and that we are building through the Measure R and Measure M capital programs are able to withstand more frequent and extreme weather events. More importantly, the strategies in this update will ensure that our agency can continually provide essential services to all our customers despite the changing

baseline environmental conditions related to climate change. The 2019 CAAP will build upon the plans, initiatives, and programs created since the 2012 CAAP, while creating a visionary path for minimizing our greenhouse gas emission impacts to the environment and building resilience in our infrastructure and communities.
The 2019 CAAP:

- Provides an update on what Metro has accomplished and how approaches to climate action have changed since the 2012 CAAP;
- Summarizes current and projected greenhouse gas emissions from Metro operations;
- Describes how climate change could affect Metro's system and operations; and
- Identifies steps to reduce emissions and increase resilience to climate change.

The 2019 CAAP was developed by our Environmental Compliance and Sustainability Division (ECSD) staff in partnership with Enterprise Transit Asset Management, Emergency Management, Safety, Communications, Operations, Engineering, and Countywide Planning and Development.

DISCUSSION

The 2019 CAAP identifies the actions Metro will be undertaking to reduce our climate change impacts through two broad strategies:

- Reducing Metro's greenhouse gas emissions, which contribute to climate change, and
- Increasing the resiliency of the Metro system and service to the effects of extreme weather events and long-term climate changes.

The 2019 CAAP provides a summary of the greenhouse gas mitigation and climate resilience goals, strategies and actions as well as a discussion of our stakeholder engagement and the results of that engagement. Emerging issues associated with implementation, including ***prioritization of opportunities for feasible acceleration,*** are also discussed.

As outlined in the CAAP, these strategies and actions will be implemented in a variety of ways. Many strategies and actions are tied to procurement decisions. A related Board action for staff to implement a Metro Sustainable Acquisition Plan (SAP) was presented for approval in the June 2019 Board Meeting. Our ability to reduce greenhouse gas emissions and promote sustainability and environmental stewardship directly through our agency's procurement actions are addressed in the SAP.

A summary of the greenhouse gas mitigation and climate resilience goals is provided below:

- **GHG Mitigation Goals**
    - Reduce GHG emissions by 79% below 2017 levels by 2030
    - Achieve zero emissions by 2050
- **Climate Resilience Goal**
    - Create a climate resilient organization and transit system: prepared, ready and able to

provide consistent services to the people of LA County

Greenhouse Gas Mitigation

Metro has implemented a significant number of greenhouse gas emissions reduction strategies since 2012 and is on track to reduce agency operational emissions in support of the State's targets for greenhouse gas emissions reductions. Since the 2012 CAAP 2012, Metro has transitioned its bus fleet fuel from fossil natural gas to renewable natural gas, implemented numerous energy-efficient lighting, and expanded on-site renewable energy installations in the form of solar and flywheel technologies. These changes, plus the impact of state and federal policies to reduce emissions from a variety of sectors, drove Metro's greenhouse gas emissions ***down by nearly 12%*** from 2010 to 2017- *despite approximately 4% increase in service*.

Through Metro's ongoing business as usual efforts to adopt new transportation technologies and the continued impact of California's aggressive climate policies, staff projects that Metro's greenhouse gas emissions will continue to decline to 57% below 2017 levels by 2030 and 81% by 2050. While this trajectory is substantial, it is not enough. More ambitious targets for greenhouse gas reduction are necessary to minimize the impacts of climate change. Through the strategies identified in the 2019 CAAP, Metro commits to reduce direct agency greenhouse gas emissions to 79% relative to 2017 levels by 2030 and 100% (i.e., zero emissions) by 2050.

Thirteen measures have been identified to reduce emissions from every aspect of Metro's operations by 2050:

1. Switch directly operated buses to battery-powered technologies
2. Deploy battery-powered buses in the contracted fleet
3. Switch vanpool vehicles to battery-powered vehicles
4. Replace non-revenue vehicles with battery-powered vehicles
5. Install systems to store energy captured from trains
6. Buy 100% renewable energy
7. Install photovoltaic systems
8. Install water-saving fixtures
9. Install non-potable recycled water systems
10. Install LED lights at facilities
11. Install electric heating systems
12. Replace facility appliances with more efficient electric appliances
13. Install electric vehicle charging at Metro facilities and implement an employee electric vehicle outreach plan

If fully implemented, these measures are projected to avoid more than 416,000 metric tons of annual carbon dioxide emissions-the equivalent of the annual emissions of more than 88,000 passenger vehicles, while also providing net cost savings and environmental co-benefits like air quality and drought resilience.

Building Resilience

Reducing greenhouse gas emissions can help slow the pace of climate change, but it cannot stop it. California's climate is already changing, and scientists expect the changes to intensify in the years

and decades ahead. These changes pose risks to Metro's infrastructure, services, riders and employees. More extreme climate and weather conditions could interrupt service and cause delays. They could also bring safety risks; increased operation, maintenance and repair costs; and reduce Metro's ability to provide emergency services to other partners in the region.

***Building climate resilience is a risk-reduction strategy*.** Taking actions today can avoid future major costs, disruptions to service and safety risks. Metro's goal is to create a climate-resilient organization and transit system prepared, ready and able to continue to provide services to the people of LA County no matter what the future brings.

Resilience thinking is already part of Metro's daily business culture. Most planning and building decisions already include climate-resilience strategies, but there is more to be done. Metro will ensure climate-resilience is considered more thoroughly when making decisions related to planning, designing, construction, procurement, internal protocols and more, while also developing solutions that can be implemented gradually and modified as new information becomes available, minimizing costs and disruptions to service.

A climate-resilient Metro will plan proactively to reduce impacts due to climate change while ensuring climate resilience is pursued equitably across user groups and communities by:

1. Making climate resilience an organizational priority and integrating it throughout planning and daily operations.
2. Establishing a flexible approach to adaptation that can be monitored and adjusted over time as scientists improve their understanding of climate change and its impacts.

Stakeholder Engagement

Input from staff, riders, and other key external stakeholders was a critical and valuable component of developing and evaluating the goals of the 2019 CAAP. The 2019 CAAP incorporated input through the following engagement opportunities:

- Staff interviews
    - Since March 2018, ECSD staff interviewed Metro staff throughout the agency. These interviews were primarily conducted during scheduled Environmental Management System (EMS) Core Team meetings at the operating divisions. Four Bus Divisions (Divisions 9, 10, 13, and 15), five Rail Divisions (Divisions 11, 20, 21, 22, and 24), and the Central Maintenance Facility (Division 30) were interviewed. The EMS Administration group, which includes executives from Corporate Safety, Quality Assurance, Operations and Maintenance, was also interviewed. Metro staff were also engaged as part of Metro's quarterly "Growing a Greener Workforce" (GGW) meetings, which includes Metro employees who are interested in incorporating sustainability into their respective departments and have an environmental certification or credential. Employees who participated in the CAAP from the GGW included Contract Management, ITS, Public Relations, Community Relations, Systemwide Design, Government Relations, and Emergency Management. Other Metro groups interviewed included Construction Management, Facilities Engineering, Emergency Management, Enterprise Transit Asset Management, Systems Engineering, Countywide Planning and

Development, and Wayside Systems.

- Metro Sustainability Council
  - The Metro Sustainability Council has provided an objective forum for external collaboration for the 2019 CAAP. Staff presented to the Sustainability Council monthly from October 2018 to April 2019, including two workshops with councilmembers. The engagement strategy for the CAAP was developed with guidance and concurrence from the Sustainability Council's executive committee and consistent with the Sustainability Council Meetings Arc. As a result of meaningful feedback from the Sustainability Council, Metro augmented its engagement strategy to include additional touchpoints and add review time to the draft CAAP. Following the two workshops, staff presented to the Sustainability Council on how stakeholder input has been incorporated into the CAAP. A comprehensive comment review matrix was developed to facilitate stakeholder tracking of input received (Attachment B). The Metro Sustainability Council unanimously endorsed the CAAP during its July 12, 2019 meeting.

- Rider survey
  - In 2019, Metro conducted the first rider survey on climate change, asking for impressions and concerns related to climate risks, including information on how extreme weather events affect riders' comfort and convenience. The survey was deployed from January 8, 2019 through February 11th, 2019 and received nearly 400 responses. The survey was advertised online through emails and posts on Metro's the Source and Twitter. Additionally, staff attended 10 of the NextGen public workshops between January 8th and February 6th, 2019. At the workshops, staff provided flyers in English and Spanish that explained the survey and directed community members to the survey's link. For community members who could not access the survey via a computer or cell phone, a laptop was available to take the survey in-person with staff assistance.

Implementing the 2019 CAAP

Meeting these goals will require bold action. To manage change effectively, Metro will need to consider several emerging issues and address potential barriers to action. Five overarching principles will guide the 2019 CAAP implementation process:

Principle 1: Embrace Climate Leadership
Implementing the 2019 CAAP requires leadership, collaboration and bold action from Metro senior leadership; participation from Metro's entire workforce to contribute to an organizational culture of climate leadership; and active engagement from Metro's vast network of stakeholders to provide critical input and advice. All of these teams will work to reduce emissions and increase resilience while also aligning with other Metro priorities, such as equity goals outlined in the Equity Platform Framework, infrastructure and operational goals set out in the Long Range Transportation Plan and Agency level goals identified in Vision 2028 Strategic Plan.

Principle 2: Secure Funding and Prioritize Resources
While many resources already designated for planning, designing, building and operating the Metro system can be leveraged in pursuit of climate action, additional resources will be required to

implement the CAAP. Climate action must be reflected across all funding strategies and identified within both department and project budgets.

Wherever feasible, partnerships should be leveraged to jointly support climate related initiatives. This can be accomplished by identifying external partners that share Metro's vision for climate action and whose decisions collectively impact the sustainability of the region, such as City and County of LA, Caltrans and other state and local agencies. There is also value in private sector partnerships to maximize financial capital to fund, operate and maintain assets that contribute to impactful climate action. By working together and pooling financial resources, mitigation potential and preparations for climate risks can be optimized.

Principle 3: Integrate Climate Knowledge into Existing Decision Making Processes

Climate forward thinking must be seamlessly and rigorously integrated into existing decision making processes and systems. Key planning, design, construction, procurement and risk mitigation decisions require knowledge about GHG emissions and climate resilience. Integrating climate change thinking into Metro operations and processes has already begun in many Metro departments, through new sustainable acquisition practices and the use of lifecycle costing tools. Climate information and data will be incorporated as inputs when evaluating choices, alternatives and project priorities.

Principle 4: Monitor and Evaluate Progress

To maintain transparency and accountability to the goals set in this CAAP and to communicate any new goals and measures, the Energy & Resources Report and future Sustainability Reports will provide an annual update to stakeholders on Agency progress and the status of implementation timeframes.

Annual CAAP reporting will track the status of pilots, technology assessments, financial analyses, decision making outcomes and other major planning efforts underway. Reports will not only highlight key successes, but also identify where challenges or barriers persist. Additionally, these reports provide an opportunity to reevaluate technology choices, specific mitigation measures and actions, and implementation timelines. ***Opportunities for feasible acceleration will be prioritized, subject to emerging issues and constraints and considering responsible stewardship of taxpayer dollars.***

Principle 5: Engage with Community Stakeholders

Input and expertise from staff, riders and other key stakeholders will be a key component of implementing and evaluating the goals in this CAAP. Increased collaboration through existing partnerships will support implementation of CAAP goals while also helping to identify co benefits or redundancies among partners.

Metro will leverage existing engagement mechanisms with new ones for strategic exchange of information. Existing mechanisms include: ridership surveys, Service Councils, the Sustainability Council, general councils (e.g., Transportation Business Advisory Council), website content, email, social media, local committees, customized trainings and conference presentations. Internal communication channels include MyMetro Headlines section of the Metro intranet portal, department

newsletters, employee visual messaging boards at division facilities and employee trainings. New engagement opportunities and innovative ideas that further the agency's climate action and resilience goals can also be captured through the Unsolicited Proposal Process and Public Private Partnerships programs.

CEQA Considerations

The 2019 CAAP is not a project for the purposes of the California Environmental Quality Act (CEQA), and any projects, mitigation or other measures described in the CAAP will be developed and adopted through a public review process which includes CEQA compliance, if required. Evaluation of future project-level impacts is too speculative to include in an environmental document at this time as the CAAP is a policy document and does not include the approval of any specific project (see CEQA Guidelines Section 15145).

DETERMINATION OF SAFETY IMPACT

The CAAP affirms and reinforces a strong safety and preparedness culture throughout our operations and practices. A key element of the CAAP will be to promote a transportation system that improves safety for travelers by preparing the system for a variety of hazards.

FINANCIAL IMPACT

We will leverage funding and staff resources to accelerate the achievement of goals and initiatives prioritized in this CAAP. This includes aligning the agency's business processes, resources, plans, and tools with the CAAP's vision, goals, and initiatives and ensuring that financial decisions, annual budgets, programs, services support the Metro 2019 CAAP. It also means aligning human capital and financial resource decisions to reflect the CAAP's vision and priorities. This realignment will occur in a phased approach over the next several years to allow for the completion of initiatives that are already in progress. Assessments of planning, capital, or operating costs associated with specific initiatives in the CAAP may also be brought before the Board for action individually, or as part of a program or associated actions, as appropriate.

Impact to Budget

There is no change to the FY20 approved budget. Individual projects or initiatives outlined in the CAAP will be developed with individual project budgets and resource allocations.

IMPLEMENTATION OF STRATEGIC PLAN GOALS

As outlined in the report, the 2019 CAAP was developed to harmonize GHG and resilience goals with broader Agency goals and priorities set forth by other Metro documents, including the Vision 2028 Strategic Plan. Specifically, the risk assessment methodology included indicators that directly aligned with one or more of the Strategic Plan goals (see Table B-10 on page 80 of Attachment A).

ALTERNATIVES CONSIDERED

The Board could decide to delay or forgo the adoption of the 2019 CAAP. This alternative is not

recommended. The strategies in this 2019 CAAP are essential to maintain the momentum to reach our ambitious near and long-term climate reducing goals. This climate action and adaptation plan is critical to ensure Metro can continue to provide vital mobility services to LA County as the climate changes. Over the coming decades, the Los Angeles County region will undertake one of the largest transportation infrastructure investments in the western hemisphere. As LA Metro works with public, community, and private sector partners to build out this infrastructure for the future, we are also seizing opportunities to create a visionary path for minimizing contributions to climate change while building resilience to a changing climate for the over 1.2 million people who rely directly on our bus and train service today and more than 10 million people whose quality of life is affected by our ability to implement transportation solutions that successfully meet their mobility needs in the next ten years. The Board's adoption of the CAAP will provide support and direction for a comprehensive climate action plan from our agency and spur the collective actions necessary to advance our vision for a world-class transportation system that will efficiently, effectively, and equitably serve the mobility needs of people who live, work, and play within LA County.

NEXT STEPS

Upon Board approval, ECSD will act as the lead department facilitating the implementation of 2019 CAAP goals and will oversee implementation of the strategies while working with and supporting key internal stakeholders. ECSD will provide these key departments with technical analysis, project development, lifecycle costing, funding identification, education and training support.

The CAAP is a policy level document that requires additional steps to determine project-level impacts, including any acceleration and costs. Staff will determine these impacts concurrent with the environmental impact analysis, when necessary, prior to executing on projects and initiatives consistent with identified CAAP strategies.

Implementation best practices already exist within Metro. For example, the Environmental Management System to monitor, track, and evaluate progress and outcomes of climate related initiatives across the Agency. The SAP is another mechanism to ensure CAAP goals are incorporated into our procurement of goods and services. -

Consistent with the implementation principles laid out above, staff will report back on CAAP implementation on an annual basis through existing sustainability reporting mechanisms.

ATTACHMENTS

Attachment A - 2019 Metro Climate Action and Adaptation Plan
Attachment B - Sustainability Council Comments and Response Log

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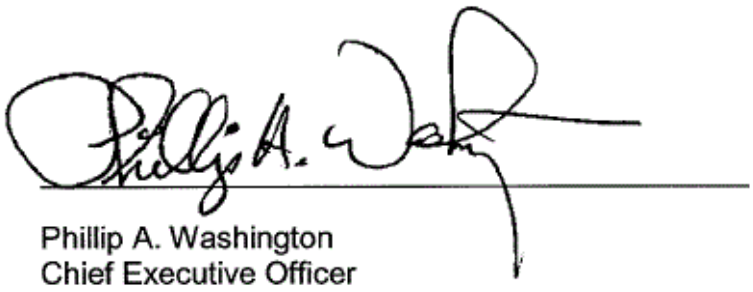


Phillip A. Washington
Chief Executive Officer

Attachment A

http://libraryarchives.metro.net/DB_Attachments/2019-0489_Attachment_A_Draft_Final_2019_CAAP.pdf

Metro Interoffice Memo

Date	April 8, 2019
To	Metro Sustainability Council
From	Cris Liban, Executive Officer, Projects Engineering
Subject	Metro Climate Action and Adaptation Plan Comment Resolution

Metro staff sincerely appreciates the time, effort, and collaboration of the Metro Sustainability Council (Council) on the update the Metro Climate Action and Adaptation Plan (CAAP). At the October 2018 meeting, Metro introduced the Council the the CAAP Update. Since then, Council members and Metro staff have engaged monthly on the CAAP Update, and the Council has provided valuable feedback.

On March 8, 2019, Metro staff presented an overview of the Draft CAAP Update report to the Council, and a copy of the report was disseminated later that day. To facilitate an engaging partnership on the Draft CAAP Update, an engagement opportunity meeting was held at Metro headquarters on March 14th, during which time Metro and consultant staff were available to review the draft report, answer any questions, and capture verbal comments. Additionally, to provide the Council more time for a meaningful and thorough review, the deadline for comments was extended from March 22nd to end of business April 2nd.

Metro staff has since reviewed the excellent and insightful comments submitted by Council members. Metro truly appreciates the commitment to engagement and has addressed the comments in the most technically appropriate manner. Response to all comments received orally at the March 14th meeting as well as those received electronically by the deadline were included in the attached comment matrix. For a detailed overview of responses to all comments, please review the accompanying comment matrix.

Many of the comments submitted by Council members identified critical issues, which Metro staff has categorized as emerging issues. Accordingly, the CAAP Update is being revised to include a section for these emerging issues within the Implementation Chapter. This section will identify aspirations for the agency, including strategy acceleration, entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.). Additionally, these emerging issues will be addressed fully in the Metro Sustainability Strategic Plan, currently in development, as well as other Metro planning documents brought forth to the Metro Sustainability Council.

Sustainability Council Comments and Responses for the Draft 2019 Metro CAAP April 9th, 2019

#	Reviewer	Chapter #	Page #	Line #	Sustainability Council Comment	Response
1	March 14th Meeting*	3			Would like to see more communication and involvement with public in list of actions. It's important to communicate these risks to the public.	External communication is a major component of how Metro is planning around risk, and the CAAP includes a critical external communication component as outlined in principle# 5 in Chapter 4. The CAAP also emphasizes the need to coordinate with other efforts inside and outside of Metro, such as Metro's All-Hazards Mitigation Plan.
2	March 14th Meeting*	3			This feels like framework of how Metro should approach adaptation in general and less like an action plan. Is the first bullet point (about identifying triggers, thresholds, metrics, etc.) going to be addressed in the CAAP or the Resiliency Framework or other documents?	The introduction to section 3.3 and Principle 4 in Chapter 4 will be revised to clarify.
3	March 14th Meeting*	3			Liked the elevator pathway, would like to see more of those.	At this point, we are not planning on adding more examples pathways into the CAAP, but will be developing them during implementation, and can provide additional examples in our annual Sustainability Reporting.
4	March 14th Meeting*	3	41		Table 3.2. Saw this as a "menu" of adaptation actions that are out there, but no recommendations on which ones are good for Metro and which ones Metro is specifically tackling. Is that correct?	All of these actions have been partially implemented or studied. Language throughout Chapter 3 will be revised to make it clear that adaptation actions are already being implemented at Metro, and that Metro is open to exploring all available adaptation actions beyond those in this table as part of the adaptation pathways approach.
5	March 14th Meeting*	3	41		To Table 3.2, add another column that says "type" or "department" explaining where specific actions take place within Metro.	We will add another column to the "Example Adaptation Actions" Table in Chapter 3 that indicates the type of process the measure might fall under: Planning, Design & Engineering; Procurement; Asset Management & Maintenance; Operations; Emergency Management & Disaster Response.
6	March 14th Meeting*	3			Include outreach to adjoining agencies and other stakeholders throughout County/state. When thresholds are exceeded and action needs to occur, Metro will need money, so they should discuss with these outside entities so that money is ready and available when needed.	We will expand upon in Principle 2 within Chapter 4.
7	March 14th Meeting*	3			Absent from risks is drought and how that affects green infrastructure in transportation space. Heat impacts on air quality is also missing.	The limitations of both of those are addressed in Appendix B--Drought is embedded in the extreme heat section. We will add a sentence to the main body under the discussion of extreme heat risks to further emphasize: "Extreme heat often leads to reduced air quality, which further impacts health."
8	March 14th Meeting*	3			In assets listed, there's no green infrastructure - there's more "hard" assets that are listed.	We will edit the asset list in Chapter 3 to clarify that this list is imperfect and not comprehensive, and there is room for improvement on data management. Metro's asset management database contains almost 26,000 records of distinct assets, including landscaping. Green infrastructure is embedded in many of these assets as well, including for example almost 80 miles of bioswales and California native or drought tolerant landscaping. Risk analysis is limited to the availability of geospatial data which, does not distinguish the green infrastructure components from hard assets.
9	March 14th Meeting*	Overall			When meeting with other stakeholders, should make the purpose/overview of the report more clear.	The CAAP will be revised to clarify the purpose of the plan, and the executive summary and introduction sections will be edited to provide a better overview of the plan.
10	March 14th Meeting*	1	4		Will we get to see the rest of the bus survey results?	The Survey Results will be provided in a new appendix, Appendix E.
11	March 14th Meeting*	Overall			Interfacing this with SCAG or CTC plans?	Metro ECSD is coordinating closely with Metro Countywide Planning, specifically with Long Range Planning and the Federal/State Policy and Programming business units to ensure that we can leverage opportunities both in the preparation of the SCAG RTP/SCS and any revisions to CTC funding allocations. With SB 526 (Allen) under consideration this legislative session, there is now uncertainty in this process. Metro will adapt our approach to achieve our climate goals.
12	March 14th Meeting*	ES			Are the 8 mitigation measures in here?	The Executive Summary will be revised to clarify.
13	March 14th Meeting*	Overall			Does this plan break out any new initiatives or summarize what's already happening? What's different from existing policy? What is Metro self-initiating with this plan? Where are the new measures?	A column will be added to Table 2-7 that describes Metro's current progress in each area addressed by a mitigation measure. Existing or ongoing commitments, plans, studies, and pilot initiatives will be included here where relevant.

14	March 14th Meeting*	Overall			The battery electric buses have been approved by the Board, so how do we know which of these are new due to the CAAP?	A column will be added to Table 2-7 that describes Metro's current progress in each area addressed by a mitigation measure. Existing or ongoing commitments, plans, studies, and pilot initiatives will be included here where relevant.
15	March 14th Meeting*	2	19		Would these measures be in the future Energy Resources report and be tracked every year to make sure Metro is on track to meet these?	Formal reporting on CAAP initiatives will be included in annual sustainability reports beginning with 2020 Energy and Resource Report (approx. June 2020). Additional information will be added under Principle 4 (monitoring and evaluating) in Chapter 4.
16	March 14th Meeting*	ES			There should be a risk management matrix that says for each risk how it's graded, the mitigation actions, the triggers for engaging that action and what to do when those triggers are reached, etc. Table 3-1 gives the score, but each item should also list a way to mitigate that risk and/or respond to that risk if it becomes a reality. Recommend having the CAAP start out with this table, and then throughout plan go into those in more detail. Could put this in Executive Summary. Connecting actions to risks more can create thresholds that can be followed up on and lay foundations for next actions. Prioritize high risks in the actions.	The Executive Summary will be revised. Related to risk management, we are moving towards a culture of embedding risk in decision-making: information that's needed, metrics we should be tracking to know how to act, etc.
17	March 14th Meeting*	1	3	25-28	Add a Number 3 to the list; sentence most appropriate is on pg. 38: "The CAAP supports this goal by identifying ways the agency can increase its resiliency to climate risks while also aligning with agency goals and priorities set in the Equity Platform Framework, Vision 2028 Strategic Plan and the 2009 Long Range Transportation Plan." Make this a 3rd point or replace it with the 2nd point.	Statement of climate resilience will be refined in Section 3.3 to include this language.
18	March 14th Meeting*	1			CAAP talks about being aligned with local initiatives, but where is the Roadmap Initiative with LA Cleantech Incubator (LACI)?	Metro's committed goal of nearly 80% reduction in agency GHG emissions by 2030 outlined in the current version of the CAAP is consistent and greatly exceeds Metro's contribution to the TEP goal of 25% reduction in LA County transportation-sector GHG emissions and air pollution by 2028. The CAAP maintains Metro's commitment of a 100% ZEB fleet by 2030, consistent with the "Local transit" sector target in the TEP. CAAP goals for installation of employee commuting charging infrastructure and electrification of non-revenue and vanpool vehicles all contribute to the TEP's People Movement targets.
19	March 14th Meeting*	1			In response to above comment: LACI's Roadmap is not part of statutory mandate of state; LACI might make good recommendations but Metro should not be held accountable to that. Other state mandates do have funding behind them that Metro can be held accountable to.	Metro's committed goal of nearly 80% reduction in agency GHG emissions by 2030 outlined in the current version of the CAAP is consistent and greatly exceeds Metro's contribution to the TEP goal of 25% reduction in LA County transportation-sector GHG emissions and air pollution by 2028. The CAAP maintains Metro's commitment of a 100% ZEB fleet by 2030, consistent with the "Local transit" sector target in the TEP. CAAP goals for installation of employee commuting charging infrastructure and electrification of non-revenue and vanpool vehicles all contribute to the TEP's People Movement targets.
20	March 14th Meeting*	2	19		In mitigation measures list, add a column saying where we're at right now. This information can help stakeholders. Could have a color-coding approach saying if things are a recommitment, policy, etc.	A column will be added to Table 2-7 that describes Metro's current progress in each area addressed by a mitigation measure. Existing or ongoing commitments, plans, studies, and pilot initiatives will be included here where relevant.
21	March 14th Meeting*	ES			Is this document visionary? Are the measures enough?	This report aligns with the aspirations outlined in Motion 57 and provides a roadmap to address Metro's continuing efforts to reduce its own greenhouse gas emissions. Metro aligns these strategies with those of others that it can influence.
22	March 14th Meeting*	Overall			Would rather see a limited action plan that's implemented and can be held accountable, rather than a bold vision plan with many actions; need to find this balance. It is important to include that this report is visionary, but need to consider the cost.	Executive Summary will be revised to address this. Edits throughout the report will be made to keep consistent message.

23	March 14th Meeting*	ES			Need to incorporate information on the cost of these measures and when cost is important.	We will include a table in the Executive Summary that shows each of the measures, the NPV over the analysis period (2019-2050), and the annual emissions reduced from 2017 levels. We will also include annual emissions reduced from 2017 levels in table 2-11 (Mitigation Scenario Implementation Costs and Emission Reductions), and rename the columns for clarity.
24	March 14th Meeting*	2	16		Emissions inventory shows the biggest potential is from Metro's ability to decrease VMT. Crosswalk ridership projections with Metro's strategic plan?	We will add a paragraph in Chapter 2 in the Greenhouse Gas Mitigation at Metro "Approach" section to clarify.
25	March 14th Meeting*	2	16		Don't just look at Metro's positive impacts on VMT, but also see if Metro is increasing VMT.	Language in Chapter 2 will be included to identify areas of potential GHG impacts and benefits that are not currently addressed in this CAAP such as upstream emissions from purchased goods, waste disposal, and construction projects.
26	March 14th Meeting*	3	32		Transit-Dependent Vulnerability Map - is there an effort to connect this with equity framework?	Metro's Equity Platform is still being developed. The Equity Focused Communities mapping project is still underway and was not available to include in this CAAP. We will add tithe following note to Chapter 3 in the explanation of the map: "Metro is in the process of developing an Equity Platform, an additional tool to define a common basis for Metro and the community to build an agenda around improving equity."
27	March 14th Meeting*	ES			Major changes should be made to Exec Summary. Make it about the bold vision of Metro and what we're doing, where we're headed. Bring out the headlines--so they can say, look, here is what Metro is doing. What are the costs to Metro? Make recommendations for specific action to be more ambitious and specific. Make ES more advocacy. Detail measures, next steps, explain that adaptation approach is first time it's being embedded into a public agency in California--i.e. sell the approach.	Executive Summary will be revised accordingly.
28	March 14th Meeting*	ES			In ES, the resilience goals and the next steps are confusing--some are really similar, some are different. Look at them side-by-side, and how mitigation would fit in. Resilience Goal #6 seems similar to 4th implementation principal. Need clearer goal or principle around metrics/thresholds. Need clearer/upfront that establishing metrics is an essential step. Also, consider using language that talks about tying actions to something measurable. Metrics still need to be brought out more--best discussion of need for triggers is buried in case study, but it needs to be prominent.	Executive Summary will revised so that the discussion of thresholds is made more prominent.
29	March 14th Meeting*	ES			Not clear how we're thinking about engaging with other agencies. What is their role? SCAG, LA, Caltrans, etc.--list them specifically.	Will be listed under Principle 5 in Chapter 4.
30	Roy Thun	3	29	1	General comment the document does a good job of identifying risks based on vulnerability and criticality. However, there is no recognition of the wider societal impacts that are likely to occur within Metro's service area for the same, or related, climatic conditions that would effect Metro. This is very important to consider with respect to criticality of Metro's services in the face of civil unrest, emergency transportation needs and general state of panic. Suggest commenting on this topic in Chapter 3 and 4 with cross reference to Metro's operational integrity plan.	The Plan discusses Metro's critical role in creating a resilient LA, and mentions the All Hazard Mitigation Plan, which will take this broader lensed approach.
31	Yareli Sanchez	1	3	27	Metro needs to approach climate resiliency from a perspective that is less centered on Metro's assets. As a large agency in the Los Angeles region, Metro's action can contribute to regional resiliency as a whole.	Agree that a resilient Metro system is one piece of a larger resilient community. The call-out box (Resilience at Metro and Beyond) in Chapter 1 highlights this point.
32	Yareli Sanchez	1	2	6	In keeping with previous comment, an important next step, once we recognize that Metro can contribute to regional resiliency, is to coordinate with other government entities to amplify efforts, identify cost saving measures, and identify how Metro's assets can be used to respond to climate emergencies (evacuations). This can perhaps be done through a cross-cutting agency committee or workgroup and will require Metro to think regionally instead of a Metro Asset approach. Next step, better coordination with other regional and agency entities.	We will expand upon in Principle 2 described in Chapter 4.
33	Yareli Sanchez	3	39	4	Should recognize that riders are also critical partners in monitoring on the ground conditions and the efficacy of Metro's response/interventions	External communication is a major component of how Metro is planning around risk, and the CAAP includes a critical external communication component as outlined in principle #5 of Chapter 4, which highlights the value of rider input.

34	Yareli Sanchez	3	40	23	Protecting infrastructure does not necessarily have to be done through a hardening approach. Metro needs to recognize the value of both soft (natural), hard, and hybrid approaches and recognize when each is appropriate. Greening a bus station, for example, is a soft and low-cost approach to urban cooling. Add soft/natural infrastructure strategy into pathway approach and recognize in evaluation of a strategy that these are low cost and multi-benefit approaches	The Hardening/Protecting Infrastructure category of adaptation actions in Chapter 3 will be revised to include natural approaches, and we will add examples of natural infrastructure in several other places in the document.
35	Yareli Sanchez	3	40		Recognize that capacity building is also an adaptation action. Providing training, for employees, and resources, for both communities and employees, can ensure communities can respond to climate emergencies. Great you all identified communication with staff and ridership as being key!	Language will be revised so that the "operational" category of adaptation actions in Chapter 3 also includes "behavior modifications." We will discuss training and other modifications as an example.
36	Yareli Sanchez	3	40	23	Need to recognize the value of smart multi-benefit design here as well, not just engineering. Good design and better materials can increase dependability but also feeling of safety, aesthetic value, etc.	Principles #3 and #5 in Chapter 4 will be revised to note benefits of collaboration and co-benefits.
37	April 2nd Letter**				I.1.a. Metro should pledge to go ZERO CARBON for transportation, property assets, etcetera, by [X] date, and announce an upcoming Request for Information for same;	This CAAP includes an aggressive commitment to reducing GHG emissions by 87% from 2017 levels by 2050. While the CAAP does outline an opportunity to reduce emissions to zero through the purchase of carbon offsets, the CAAP does not include carbon offset purchases as a mitigation measure. However, the CAAP will be revised to adopt all 13 mitigation measures analyzed which will increase the GHG emissions reduction targets. Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.).
38	April 2nd Letter**				I.1.b. Metro should plan a pathway to become NET-ZERO for buildings and site-facilities which will include additional on-site distributed generation (DG) such as photo-voltaic system/solar thermal system/ inverter plus battery energy storage and micro-grids, By [X} date Metro should have a clear plan for onsite DG and resiliency measures; by [x} date Metro should have begun plans to install onsite DG and a microgrid at [X] these locations and by [X] date at these locations;	Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.). As part of advancing implementation for GHG strategies outlined in this CAAP, Metro will be developing updates to existing energy management plans that will specifically address opportunities for incorporation of net-zero building technology, distributed generation and microgrids, and renewable energy supply. Metro is also finalizing a Green Procurement Framework to address material and product selection.
39	April 2nd Letter**				I.2. Metro should plan to exceed Cal-Green via modifications/upgrades/retrofits: double glazed windows, low-E; building automation systems; roof and our wall insulations by [X} date;	Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.). As part of advancing implementation for GHG strategies outlined in this CAAP, Metro will be developing updates to existing energy management plans that will specifically address opportunities for incorporation of net-zero building technology, distributed generation and microgrids, and renewable energy supply. Metro is also finalizing a Green Procurement Framework to address material and product selection. Through the Metro Sustainability Plan Program (as related to construction of all Metro infrastructure), the most recent and most stringent requirements for CALGreen compliance and exceedance are included for Purple Line Extension 3. Metro will monitor how the mandatory and voluntary requirements are being applied and incorporate the lessons learned in the implementation of other projects.

40	April 2nd Letter**				I.3. Metro should convert to zero-emission for the non-contracted bus fleet by 2025, (Date and timeline for accountability);	Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.).
41	April 2nd Letter**				I.4. Creating Electrification of Metrolink rails for which LA Metro is the planning agency, which has been broadly discussed… Electrification of rail transportation, for which LA Metro is a transportation planning agency; and electrification of certain lines: It has been previously discussed in terms of the value of introducing electrified rolling stock (such as electric locomotives, electric multiple units, hybrid-electric units, or dual-mode electric units), among lines with higher frequencies of service. The capital investments could provide a platform upon which to implement electrification.	We are coordinating with our partner agencies such as Metrolink to plan for such an initiative.
42	April 2nd Letter**				I.5. Metro should determine and include which best practices to undertake to influence commuter behavior: In other words what should LA Metro / Metrolink's light rail consider in light of the top railways/bus systems in the world? Examples: free fares, cleaner trains and buses, free wifi, seamless fare systems (applications for Android and i-Phone users), timeliness (not having to wait more than 4 minutes in between trains)	Though not explicitly addressed in this CAAP, Metro constantly strives to provide a world-class transportation system that enhances quality of life for all who live, work and play within LA County. As such, the agency has initiatives around many of the items mentioned here. LA Metro is currently piloting Wi-Fi on Metro trains and buses. In addition, Metro is conducting a NextGen Bus Study, the goal of which is to create an attractive and competitive world-class bus system. To achieve this goal, all aspects of Metro bus service are on the table for study, including speed, distance, frequency, time of day, reliability as well as quality of service and safety. Additionally, at the Metro December 2018 Board Meeting, new mobility fees and congestion pricing were studied as part of Item 38. Receive and File of the Twenty-Eight by '28 White Paper. The Agenda item noted that a congestion pricing initiative could position the agency to offer free transit services in time for the 2028 Olympic Games. Metro is also in the early stages of developing a Customer Experience plan and indicators. Metro values timeliness, which is why it was a key component of the Metro Vision 2028 Strategic Plan. Metro is striving to improve wait times on lines like the Purple Line to achieve trains every 4 minutes. Lastly, Office of Extraordinary Innovation has an unsolicited proposal process, for which any new innovative partnership projects can be submitted for review.
43	April 2nd Letter**				II.a. Metro cannot wait 30 years to electrify the contracted bus fleet (BEB Deployment Contracted, as referred to on page 23) given that it has contracting authority for doing same. Metro can and needs to develop a time frame for turn over within 10 years, based on current contract obligations and not extending further contractual relationships with buses other than zero-emission buses.	Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.).
44	April 2nd Letter**				II.b. Similarly, Metro cannot wait 30 years to turn over the vanpool assets (Battery Electric Vehicle (BEV) Vanpool Deployment, as referenced on page 23). The useful life of the current vehicles is likely not 30 years, as such there should be a refusal to purchase any new vehicles that are not zero-emission).	Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.).
45	April 2nd Letter**				II.c. Any further investment in any fuels that will ultimately be replaced is wasteful of Metro and taxpayer resources. Existing gas infrastructure should be utilized as a redundant or emergency back-up system in the event of a natural disaster prior to Metro adopting needed resiliency technologies such as distributed generation, battery energy storage and microgrids.	Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.).
46	April 2nd Letter**				III.a. Three decades to replace existing heating, venting and air conditioning systems (Facility Heating, Venting and Air Conditioning Electrification) and replace appliances (Facility Appliance Electrification) is excessive.	Chapter 4 now includes an Emerging Issues section that identify acceleration strategies, where feasible. This section describes entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.). As part of advancing implementation for GHG strategies outlined in this CAAP, Metro will be developing updates to existing energy management plans that will specifically address opportunities for incorporation of net-zero building technology, distributed generation and microgrids, and renewable energy supply. Metro is also finalizing a Green Procurement Framework to address material and product selection.

47	April 2nd Letter**				III.b. Similarly, Facility LED lighting installation is “low-hanging fruit” and Metro can set a more actionable time frame of completion within 5 years, not a 2030 deadline.	Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.). As part of advancing implementation for GHG strategies outlined in this CAAP, Metro will be developing updates to existing energy management plans that will specifically address opportunities for incorporation of net-zero building technology, distributed generation and microgrids, and renewable energy supply.
48	April 2nd Letter**				IV.a. Metro will experience increased demand for electricity through the next 3 decades and the planned amount of distributed generation is insufficient for same. The annual planned amount of installed photovoltaic is insufficient given the needs and a division, by division, or line by line approach should be considered, and possibly a Request for Information issued regarding same.	Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.). As part of advancing implementation for GHG strategies outlined in this CAAP, Metro will be developing updates to existing energy management plans that will specifically address opportunities for incorporation of net-zero building technology, distributed generation and microgrids, and renewable energy supply.
49	April 2nd Letter**				IV.b. Metro should be focusing on becoming Net Zero which involves including battery energy storage as part of the planning for zero emission bus line and rail line (infra) electrification.	Chapter 4 will include an Emerging Issues section that will identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.). As part of advancing implementation for GHG strategies outlined in this CAAP, Metro will be developing updates to existing energy management plans that will specifically address opportunities for incorporation of net-zero building technology, distributed generation and microgrids, and renewable energy supply.
50	April 2nd Letter**				V.a. Misleading analysis as well in the context of GRID GHG impacts versus Transportation and Building Stock/ Property GHG impacts: This point concerns page 21, Measure ES-2 and the assertion “…greenhouse gas emissions benefits do not fully emerge until California’s electricity grid is less carbon intensive than the renewable natural gas Metro is currently supplying to our CNG fleet, approximately 2031.” There are Grid impacts and there are local air quality impacts in the urban cities that they service, (quieter, cleaner, safer) including no tail pipe emissions. In other words: if the grid is dirty, it’s okay if our buses are dirty, too; we don’t need to clean up our buses(?).	Metro recognizes the air quality benefits of vehicle electrification and as such has committed to a 100% ZEB fleet by 2030 (the full quote reads as follows: "While this transition provides **immediate air quality benefits**, the greenhouse gas emissions benefits do not fully emerge until California's electricity grid is less carbon intensive that the renewable natural gas Metro is currently supplying to our CNG fleet, approximately 2031."). However, it is important to note that currently projections for greenhouse gas emissions indicate an increase in greenhouse gas emissions if Metro were to continue to rely on grid-supplied electricity while transitioning to ZEB fleets. Despite this, the CAAP recommends transitioning Metro's fleets to ZEB and pursuing lower-carbon sources of electricity to mitigate a potential increase in GHG emissions from electrification. Figure 2-9 (Metro greenhouse gas emissions, by end-use category, all mitigation measures, 2019–2050) in the current CAAP outlines how pursuing lower-carbon sources of electricity can facilitate even greater reductions in GHG emissions. Additional language will be added in this section of Chapter 2 to ensure clarity and avoid any misrepresentations of the analysis.

51	April 2nd Letter**				V.b.A) The supply of what is actual renewable natural gas, is very small; so the idea of running Mero's buses on RNG is troubling;	Metro has contracting authority to provide up to 100% of its bus fuel requirements with RNG and there is no indication that supply is limited. Further, Metro's supply contracts for RNG in no way impact the availability of fuel for its bus fleet, so there is no impact or added risk to bus operations. Metro's RNG supply program is consistent with the agency's commitment to a ZEB fleet by 2030, with RNG acting as a transitional low-carbon fuel while ZEB implementation ramps up.
52	April 2nd Letter**				V.b.B) As well, tail Pipe Emissions matter: page 21, E-2; This text box negates harmful emissions from near zero or "low NOX" buses. It also fails to discuss the local air quality benefits from zero-emissions that are needed in communities that live in and around our transit corridors that these buses and trains service.	While the scope of the inventory and mitigation analyses is focused on GHG emissions, we will include text that acknowledges air pollution emissions from CNG buses within the Regional Context. Metro is in the process of procuring ZEBs in the fastest way possible. We are in the transition phase, with the goal of ensuring we maintain the level of service using the cleanest fleet and fuel possible and available to us.
53	April 2nd Letter**				V.b.C) Finally, a strategy that involves purchasing credits is not one that benefits Angelenos who live around or ride LA Metro transportation modalities.	In section 2.4 ("Getting to Zero" text box) we examine the potential for carbon offsets, but conclude that currently, though this strategy has been utilized as a viable option by other entities, Metro has chosen to instead focus on reducing emissions by investing in transportation infrastructure. We will provide additional text to further reinforce this point.
54	April 2nd Letter**				VI.a.i. The process for decision-making should include a discussion of the External Benefits Estimator (which includes the societal benefits to the region- including social costs of carbon, as well as job creation aspects, as well as projects that change the transit-rider's experience); as has been used by other transportation planning agencies. As opposed to just cost (implementation and otherwise) and feasibility as primary decision makers. Readers will want to understand the societal/environmental benefits inherent in some projects, while still others may want to better understand the costs and financial feasibility; all of which are important.	The current cost analyses are aimed at helping Metro understand the impact on Metro's bottom line and to provide a point of comparison between measures. Both readers and decision-makers should be informed about the marginal cost-abatement potentials for each measure. In a financial resource-constrained environment, the most cost-effective GHG mitigation measures may be prioritized over those that are not as cost-effective. Regardless, the CAAP will be revised to adopt all 13 mitigation measures analyzed which will increase the GHG emissions reduction targets. Additionally, Metro is exploring tools that integrate external benefits into decision making, such as the Triple-Bottom-Line tool being piloted for the Emergency Security Operations Center (ESOC) project. The goal is to conduct these assessments at the project-level.
55	April 2nd Letter**				VI.a.ii. Metro-Directed Control should not be as heavy of an analysis point. There are few areas for which Metro cannot exert influence with respect to sustainability. This is, if it determines to implement sustainability not via a business-as-usual approach. For example, because Metro enters into contracts for some of the buses it utilizes, it can exert control vis-à-vis the contracting process; similarly, the Battery Electric Vanpool deployment is also something within Metro direct control. Metro can make a determination as to which types of vehicles for which it will provide rebates and incentives. Additionally, Metro likely has domain over where it provides parking for its employees and can implement measures to incentivize employees to ride share or alternatively provide more vehicle chargers. The concept of direct control versus another kind of control is a means to delay sustainability planning.	Analyzing how and where Metro's influence can change outcomes is a critical part of determining feasibility and ultimately implementing the GHG measures outline in this CAAP. Taking the various Metro fleets as an example, there are different ownership models that need to be taken into account when determining how to implement the electrification strategy. Additional language will be included in the revised CAAP to clarify "direct control" and how this analysis was used to inform implementation timelines. Additionally, as of April 2019, Metro is in the process of developing a Green Procurement Framework, the goal of which is to exert influence in the contracting process as evidenced by the best practices cited in the Framework. The next phase of that initiative will explore additional ways beyond those best practices that Metro can influence the contracting community.
56	April 2nd Letter**				VII. Since Metro owns and controls a significant amount of property throughout the Los Angeles region, including buildings, parking lots, maintenance yards, and transit stops, the opportunity is ripe to enhance regional resilience by recognizing the multiple benefits of green infrastructure projects and prioritizing the implementation of these projects within the Climate Action and Adaptation Plan...Metro should recognize the opportunities associated with the Safe Clean Water program and all the momentum being built around green infrastructure as a tool to combat climate change and highlight and implement these strategies as part of its CAAP.	Metro values the multi-benefits of green infrastructure, and has been proactively incorporating such principles and strategies in all Metro infrastructure projects beginning with the Metro Orange Line. We realize that green infrastructure was inadequately emphasized in the CAAP. We will add several references to green infrastructure and its benefits in the CAAP.

57	April 2nd Letter**				VIII. MAINTAINING CONSISTENCY WITH LOCAL INITIATIVES IN WHICH METRO IS A PARTNER: LA Metro is a partner in Los Angeles Clean Tech Incubator's Transportation Electrification Pathway (TEP) and has been involved in developing the TEP from the inception. LA Metro's CAAP is inconsistent with these goals, which is concerning given that LA Metro helped develop these goals and yet, is now planning far less than what is an appropriate amount given the anticipated needs, as well as the GHG gains that can be achieved by encouraging LA Metro employees to switch to a zero-emission car or a hybrid.	Metro's committed goal of nearly 80% reduction in agency GHG emissions by 2030 outlined in the current version of the CAAP is consistent and greatly exceeds Metro's contribution to the TEP goal of 25% reduction in LA County transportation-sector GHG emissions and air pollution by 2028. The CAAP maintains Metro's commitment of a 100% ZEB fleet by 2030, consistent with the "Local transit" sector target in the TEP. CAAP goals for installation of employee commuting charging infrastructure and electrification of non-revenue and vanpool vehicles all contribute to the TEP's People Movement targets.
58	April 2nd Letter**				IX. CAAP STAKEHOLDER ENGAGEMENT: Opportunities for engagement regarding CAAP are lacking in LAMSC meetings. The LAMSC is a volunteer council, comprised of professionals employed by entities other than LA Metro, which means that volunteers need to have the opportunity to deal with the substance of the CAAP at the meetings. The process does not facilitate meaningful input by allowing explanation at the council meetings itself as well as tracking input from prior workshops to determine incorporation or lack thereof for different reasons. Our perception is that the majority of the feedback provided to the Metro team at the initial CAAP workshops has not been incorporated into the current draft, and we are left not understanding why. Our hypothesis is that an expedited project timeframe has made the team unable to adequately respond to feedback provided over the past few months. Considering that the CAAP only gets updated once every five years, this rushed approach does not give due importance to one of, if not the most pressing issue of our time.	The engagement strategy for the CAAP has been developed with guidance and concurrence from the LAMSC executive committee and consistent with the LAMSC Meetings ARC. However, as a result of meaningful feedback from the LAMSC, Metro augmented its engagement strategy to include additional touchpoints and add review time to the CAAP draft, which lengthened the overall project timeframe. Finally, the project timeframe is one that was committed to as part of the commitment to the Metro Board, specifically to the current Board Chair. Staff have provided regular reporting to the LAMSC on CAAP progress including two workshops that were designed specifically for LAMSC input. Following both workshops, staff presented to the LAMSC on how stakeholder input has been incorporated into the CAAP. A comprehensive comment review matrix has been developed to facilitate for stakeholder tracking of input received. This CAAP is designed to be updated as needed according to new information, to new technologies, or to new relevant statutes/regulations. A formal revisit of the whole CAAP is going to be done every five years.
59	April 2nd Letter**				X. GOVERNANCE ISSUES: In order to rise to the challenges of climate change, Metro needs leadership at the executive level to ensure that planning, construction and operations are all in alignment with CAAP objectives. We have been advocating for the creation of a Chief Sustainability Officer position at Metro, and we continue to do so with this letter as well. Per Motion 57, Metro has committed to utilizing a project-specific sustainability coordinator to guide and monitor all future highway and transit projects and report to a Sustainability Officer; however, such actions still lack the direction of quantifiable targets and metrics, are piecemeal in nature and do not signal a meaningful endeavor by the agency. Given the climate and sustainability goals inherent in Motion 57, this undertaking needs a Chief Sustainability Officer and coordinating staff to not only lead these initiatives, but follow through to execute the implementation. Currently, it appears environmental and sustainable efforts occur as sporadic pilot projects and vary widely among the different departments within Metro. ECSD has done much of this work, but there is a long ways to go yet in terms of institutionalizing these goals, which calls for additional leadership, a CSO, and team to effectuate these efforts.	Metro staff are delivering on the current CAAP strategies using existing resources and are expected to do so moving forward. This comment is going to be carried forward to address the implementation of Metro's overall sustainability and environmental program, including the CAAP.
60	April 2nd Letter**				XI. BARRIERS: Further discussion of the CAAP can and should mention any significant constraints to implementation, such as State of Good Repair issues, maintenance issues, operations issues and budgetary issues. Rather than just sticking with the low-hanging fruits, this CAAP should be an opportunity to identify higher-ambition areas of opportunity. Such information would provide necessary talking points to understand how to provide support to Metro adopting and implementing bold climate and sustainability goals.	Chapter 4 will include an Emerging Issues section that identify acceleration strategies, where feasible. This section will describe entry points where these aspirations fit within the work Metro is undertaking, potential barriers to accelerated implementation, and how the annual review of progress on CAAP initiatives will be used to adjust targets and goals with new information (technology, lessons learned, policies, etc.).

*March 14th meeting attended by: Jennifer J. Kropke, Esq., Bryn Lindblad, Michael Kadish, Wendy Nystrom, Patty Menjivar, Lorena Palacios, and Mark Kempton.

**April 2nd Letter submitted by: Jennifer J. Kropke, Esq., Bryn Lindblad, John Harriel, Jr., Will Wright, Hon., Big John Cares, Bruce Reznik, Caryn Mandelbaum, Michael Kadish, Joel Levin, and Yareli Sanchez.

61	Bryn Lindblad	1	4	Text box	The text box mentions one of the results of the Metro survey re. climate adaptation. Please make the rest of the results available, too.	The Survey Results will be provided in a new appendix, Appendix E.
62	Bryn Lindblad	2	13	table 2-4	Please explain why contracted bus GHG/VRM has increased 22% from 2010 to 2017. This is a move in the wrong direction.	As reported in Table 2-3, emissions from Metro's contracted bus fleet have increased slightly from 2010 to 2017 (7%). We don't have the full dataset from 2010 and cannot pinpoint the driving factor behind this minor trend, but believe this increase could be a result of better reporting practices and not indicative of a change in operations. At the same time, Metro's contracted bus service measured in vehicle revenue miles (VRM) has decreased by roughly 12% from 2010 to 2017 (although actual levels of service measured in vehicle revenue hours have decreased by only 2%). The slight increase in emissions and decrease in the corresponding normalization factor (VRM) exaggerate the overall change in emissions from this source. Although normalization factors are a useful way of measuring and comparing performance, this section has been removed from the final version of the CAAP.
63	Bryn Lindblad	2	12	table 2-3	Please explain why facility electricity has increased 70% from 2010 to 2017. We were told the former includes CNG whereas the latter doesn't, so if comparing apples to apples the increase would be even larger than 70%, which is troubling (a move in the wrong direction).	Based on the available data, overall electricity consumption from facilities has increased by 119% since 2010. While we are developing a normalization factor that takes into account building square footage in order to better assess this indicator. Metro has constructed or significantly expanded over a dozen maintenance facilities, 30 rail stations, and many more ancillary facilities that support 6 new or extended rail and BRT lines during that timeframe. Despite this increase in electricity consumption, GHG emissions from this sector only increased 70% due in large part to lower emissions factors from grid electricity and marginally from Metro's own on-site renewable generation.
64	Bryn Lindblad	2	16	figure 2-5	The biggest thing Metro can do for reducing GHGs is to reduce more VMT. Please consider at least mentioning that here as something that Metro could look to include more robustly in the next CAAP update.	Chapter 2 will be revised to address the importance of VMT reduction and add a connection to other Metro efforts.
65	Bryn Lindblad	2	16	4&5	Please include a commitment in this CAAP that the ridership gains projected herein will be consistent with the forthcoming LRTP.	Ridership gains projected in the CAAP were developed given planning data that was available to staff during the analysis and modeling period. The methodology and sources for this information are elaborated in Appendix A of the CAAP. Ridership projections from planned rail and BRT projects could change pending environmental review, Board approval, funding availability, and the modification or addition of new projects. GHG and ridership projections may be revised to remain consistent with the best available data and methodologies and reported out during interim reporting opportunities (e.g. annual sustainability reporting).
66	Bryn Lindblad	2	16	4&5	It would also be helpful to include what the current ridership is, so that the projections have more context.	Chapter 2 will include the 2017 Metro ridership numbers utilized in the methodology.
67	Bryn Lindblad	2	19-20	table 2-7	All of these mitigation measures are directed at Metro's own emissions, and none at displacing emissions (aka. reducing VMT). It would be good to include congestion pricing & LRTP investments as strategies that should aim to reduce GHGs through decreasing VMT.	Chapter 2 will be revised to address the importance of VMT reduction and add a connection to other Metro efforts. The CAAP looks at strategies to minimize the agency's operational emissions, while the agency's Strategic Plan and LRTP address Metro's role in regional VMT reductions, which have an impact on regional greenhouse gas emissions. Additionally, at the Metro December 2018 Board Meeting, new mobility fees and congestion pricing were studied as part of Item 38. Receive and File of the Twenty-Eight by '28 White Paper, and the agency is continuing research and development related to potential congestion pricing models.
68	Bryn Lindblad	3	30		The risk assessment approach is primarily aimed at assessing "assets", and so it has rather clumsily here had more people-centric statements added onto asset-centric assessments. Metro should rather apply a more people-centric approach that focuses on how riders are affected by climate change (e.g. in extreme heat, people need shade and access to drinking water).	We have attempted to highlight the importance of a resilient Metro system for surrounding communities and ridership and the relationship to ridership. For example, the CAAP includes a critical external communication component as outlined in principle #5 of Chapter 4, which highlights the value of rider input. We will continue to keep ridership and surrounding communities at the forefront of the work we do in this CAAP, particularly throughout implementation.

69	Bryn Lindblad	3	32	figure 3-2	How has this map of transit-dependent areas been developed? Instead, I suggest using the Equity Focus Communities map that is currently being developed.	Metro's Equity Platform is still being developed. The Equity Focused Communities mapping project is still underway and was not available to include in this CAAP. We will add tithe following note to Chapter 3 in the explanation of the map: "Metro is in the process of developing an Equity Platform, an additional tool to define a common basis for Metro and the community to build an agenda around improving equity."
70	Bryn Lindblad	3	35	15-23	Please include the impact that wildfires have in deteriorating air quality, and how that may affect people's propensity to use active transportation modes.	We will add clarifying language to the Wildfires discussion in Chapter 3, under the Key Risk Assessment Findings section.
71	Bryn Lindblad	3	37	17-25	Absent from the risks listed are: 1.) the increased likelihood and severity of drought, and how that impacts green infrastructure; 2.) how hotter days causes increased ozone/smog formation, and how that impacts active transportation.	The limitations of both of those are addressed in Appendix B--Drought is embedded in the extreme heat section. We will add a sentence to the main body under the discussion of extreme heat risks to further emphasize: "Extreme heat often leads to reduced air quality, which further impacts health."
72	Bryn Lindblad	3	38	text box	What does "under a broader, all-hazards lens" mean, and what will this 'Resiliency Indicator Framework' be used for?	We will add language clarify the All Hazard callout box in Chapter 3.
73	Bryn Lindblad	3	41-42	table 3-2	These sort of actions for adaptation are what the adaptation plan should consist of, and yet they're only included here as examples, not a plan for action. Metro should do the work to arrive at a list of actions like this and that's what should be in the CAAP. As it is now, the adaptation section reads like a concept framework (describing the concept of flexible pathways), not an action plan with clear next steps.	All of these actions have been partially implemented or studied. Language throughout Chapter 3 will be revised to make it clear that adaptation actions are already being implemented at Metro, and that Metro is open to exploring all available adaptation actions beyond those in this table as part of the adaptation pathways approach.
74	Bryn Lindblad	3	46		This example (of how to deal with an increase in elevator outages) is again a great example of what the adaptation plan should consist of. We need more of these, not just the one example.	At this point, we are not planning on adding more examples pathways into the CAAP, but will be developing them during implementation, and can provide additional examples in our annual sustainability reporting.

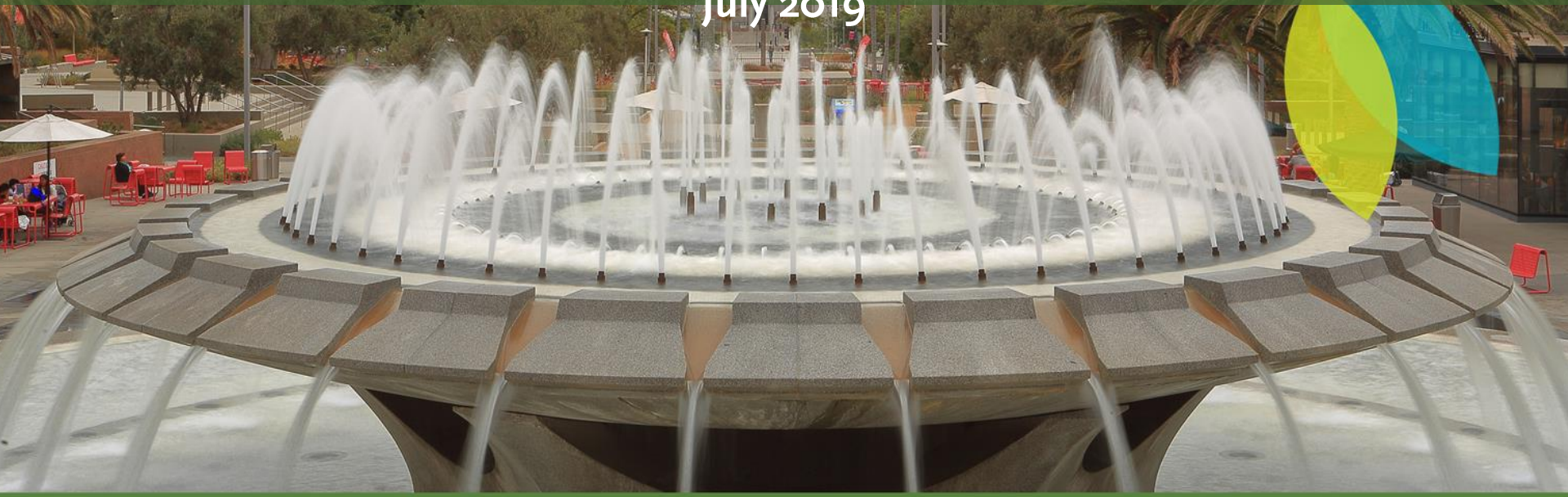
Sustainability Council Comments and Responses for the Draft Final 2019 Metro CAAP July 12th, 2019

#	Reviewer	Chapter #	Page #	Sustainability Council Comment	Response
1	Roy Thun	2	16	Going forward you may want to talk in terms of 14 mitigation measures rather than 13. The CAAP somewhat discretely notes (p. 16) that it will take additional TBD mitigation measures to achieve the last 4% reduction of emissions by 2050.	The CAAP outlines 13 specific measures the agency could take to reduce GHG emissions to 96% by 2050. However, as highlighted, additional measures will be needed to achieve zero emissions by 2050. As the CAAP is implemented and further measures are explored, those additional measures will be included. As no specific measures were identified to account for that remaining 4%, no additional measures were added to the CAAP's GHG reduction measures list.

Metro Climate Action and Adaptation Plan

Presentation to the Metro EMC

July 2019



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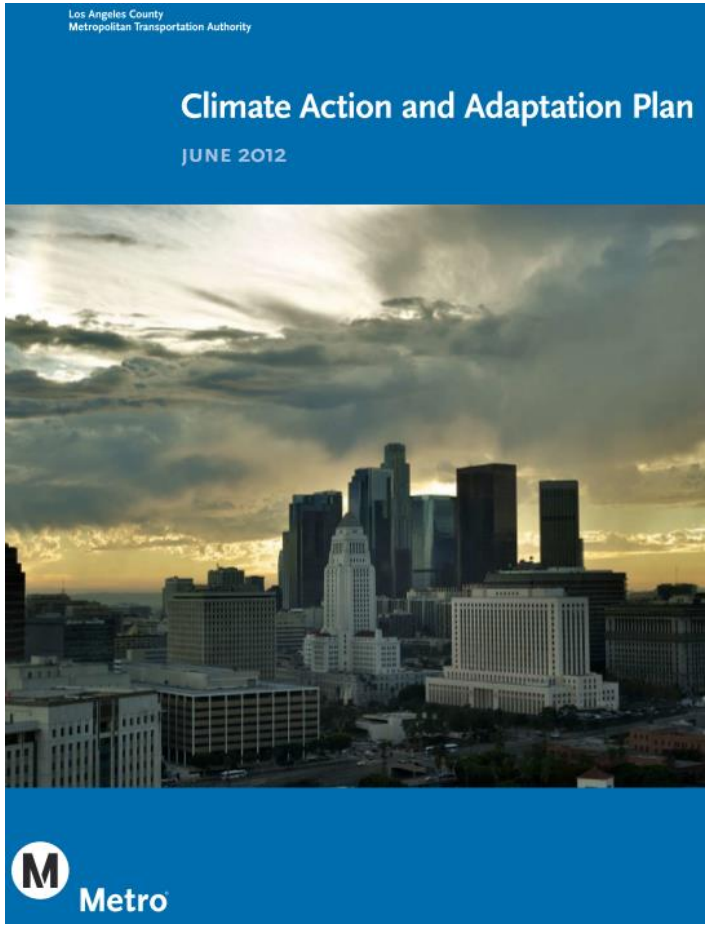
2019 Climate Action & Adaptation Plan

Overview

- 2012 CAAP established a framework for Metro projects, programs, and facilities to:
  - Reduce GHG emissions from operations
  - Prepare for the impacts of climate change on Metro's systems
- 2019 CAAP provides:
  - Updated GHG emissions forecast thru 2050
  - Identifies new GHG goals and reduction strategies
  - Identifies Metro's approach to climate resilience
  - Outlines strategic implementation principles



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2019 Climate Action & Adaptation Plan

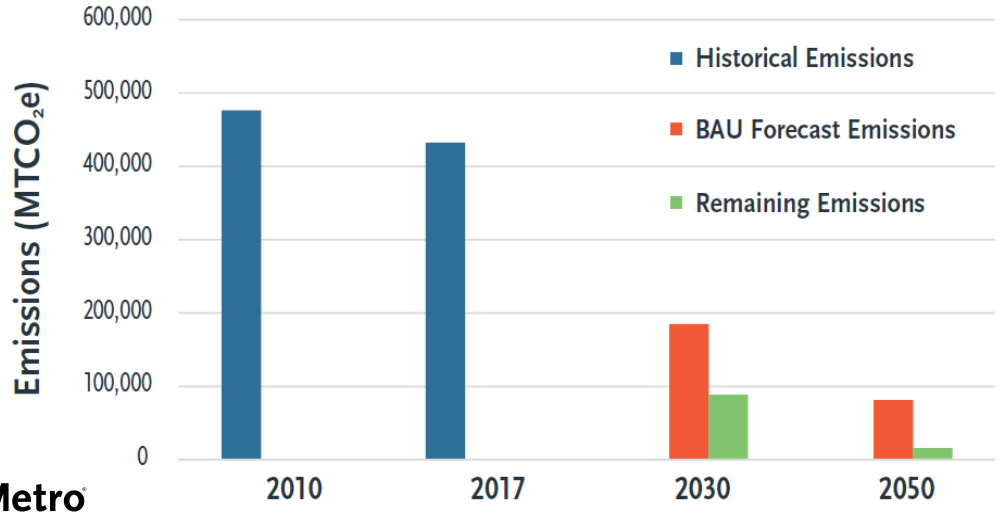
Metro reduced GHGe by **12%** from 2010 to 2017, despite ~4% increase in service

Mitigating GHG Emissions

Goals

- 2030: 79% reduction relative to 2017 levels
- 2050: 100% (zero emissions) relative to 2017

Forecasted emissions with Metro's 13 reduction measures versus Business as Usual (BAU) emissions.



GHG Mitigation Measures

- Zero emission fleets
- Renewable energy supply
- Green buildings
- EV employee commuting

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2019 Climate Action & Adaptation Plan

Building Climate Resilience

Metro increased the number of climate hazards analyzed from 3 to 7 and considered far more assets than just Metro owned assets.

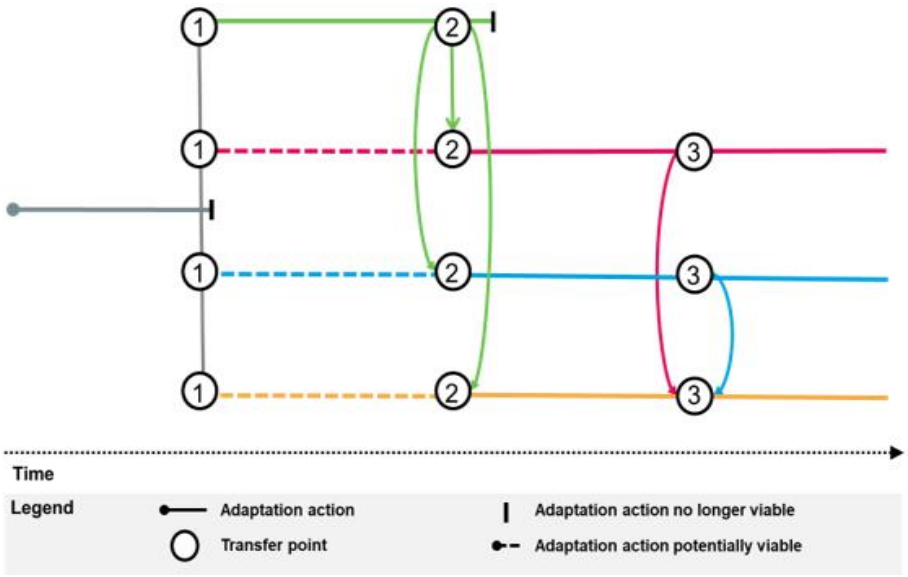
Goal

- Create a climate-resilient organization and transit system: prepared, ready and able to provide consistent services to the people of LA County

Resiliency Strategies

1. Make climate resilience an organizational priority
2. Establish a flexible approach to adaptation

Flexible Adaptation Pathway Model



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2019 Climate Action & Adaptation Plan

Stakeholder Engagement

- Metro Staff interviews
  - 9 bus and rail divisions
  - Over 18 Gateway headquarters teams
- Rider Survey
  - January-February 2019
  - Advertised online via emails, the Source, and Twitter
  - Tabled at NextGen public workshops
  - Received nearly 400 responses
- Metro Sustainability Council
  - Presentations and workshops from October 2018 through July 2019
  - *CAAP endorsed by Sustainability Council in its July 12, 2019 meeting*

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Looking Ahead

- Five implementation principles
  - Principle 1: Embrace Climate Leadership
  - Principle 2: Secure Funding and Prioritize Resources
  - Principle 3: Integrate Climate Knowledge into Existing Decision-Making Processes
  - Principle 4: Monitor and Evaluate Progress
  - Principle 5: Engage with Community Stakeholders
- Next Steps
  - Metro ECSD continues to act as implementation facilitators to monitor, track, and evaluate progress and outcomes
  - Report out on an annual basis through sustainability reporting mechanisms
  - Develop projects to implement strategies

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