

March 22, 2018

California State Legislature, Members
State Capitol
Sacramento, CA 95814

RE: Update on Status of Our Engagement with the California Air Resources Board on the Proposed Innovative Clean Transit Regulation (Zero-Emission Bus Rule)

Members of the California State Legislature:

On behalf of the California Transit Association, I would like to update you on the status of the Association's engagement with the California Air Resources Board (ARB) on the proposed Innovative Clean Transit (ICT) regulation. The proposed regulation, as initially drafted, would require transit agencies with more than 100 vehicles to begin to purchase zero-emission buses beginning 2020 and would require California's transit fleet to be 100 percent zero-emission by 2040.

In a letter addressed to ARB Chairwoman Mary Nichols, dated January 22, 2018, the Association voiced several serious concerns with the proposed ICT regulation (see Attachment A). These concerns addressed the aggressiveness of the proposed regulation's purchase mandate; its funding structure, which would limit access to state incentives to agencies that exceed baseline purchase requirements; the lack of available funding for charging infrastructure; and, the application of the regulation to cutaway buses and over the over-the-road coaches. Our concerns, while viewed *at the time* by some stakeholders as unwarranted, were shared by transit agencies across the state, including several agencies that have committed to fully zero-emission bus fleets (see Attachment B).

Since raising these concerns, the Association has been developing a counterproposal to ARB, which we hope would receive buy-in from transit agencies, environmental and environmental justice groups and the ARB. **The counterproposal, which is still in draft form, calls for regulatory action by ARB in 2018 (consistent with the proposed ICT regulation), requires each transit agency in the state to develop and submit zero-emission bus deployment plan to ARB by 2020, requests targeted new investments in disadvantaged communities and federal non-attainment areas of the state, and commits n each transit agency to operating bus fleets that are 100% zero-emission by 2040 (consistent with the proposed ICT regulation; see Attachment C).**

The draft counterproposal was developed by a group of Association members, appointed by our Executive Committee, including:

- Alameda-Contra Costa Transit District (Oakland)
- Central Contra Costa Transit Authority (Concord)
- Gillig, LLC. (Hayward)

- Los Angeles County Metropolitan Transportation Authority (Los Angeles)
- Monterey-Salinas Transit (Monterey)
- Orange County Transportation Authority (Orange)
- San Joaquin Regional Transit District (Stockton)
- Santa Cruz Metropolitan Transit District (Santa Cruz)
- San Diego Metropolitan Transit System (San Diego)
- Victor Valley Transit Authority (San Bernardino)

Some stakeholders favoring the current ARB approach have brought, and will undoubtedly continue to bring, to your attention a handful of transit agencies that have made a commitment to zero-emission buses – as a way to undercut our call for a different approach; in fact, some of those agencies are part of the group that developed this counterproposal.

The counterproposal was shared with ARB staff on February 20, 2018; Earthjustice, Sierra Club California, and the Union of Concerned Scientist on February 20, 2018; and, the American Lung Association on March 2, 2018. We have not yet received formal feedback from ARB on our proposal and we have heard from these environmental and environmental justice groups that there are elements of our counterproposal that they like and others for which they believe more work is necessary. Additionally, these groups recently shared with us that they believe there are errors in our cost model – these concerns are being taken seriously and we are updating our cost estimates, as appropriate.

We understand these environmental and environmental justice groups are now readying their own proposal to ARB, to be released soon. When that is ultimately shared with you, we hope you will see that there is significant overlap between their proposal and ours.

In the meantime, this letter is meant only to clarify that we are engaging with ARB, and with other stakeholders, on the proposed ICT regulation. As always, we welcome the opportunity to engage with you and your staff on the importance of public transit and how best to support the deployment of zero-emission buses. We look forward to your continued support for incentives that reduce the cost of zero-emission buses and charging infrastructure as well as dedicated funding for the baseline costs of implementing this regulation; and, for SB 1434 (Leyva), Association-sponsored legislation, which would seek to establish electricity rates that support widespread transit electrification.

Sincerely,

Joshua W. Shaw
Executive Director

cc: Members and Staff, California Air Resources Board
Richard Corey, Executive Officer, California Air Resources Board
Steve Cliff, Deputy Executive Officer, California Air Resources Board
Jack Kitowski, Division Chief, Mobile Source Control, California Air Resources Board
Alice Reynolds, Senior Advisor, Office of the Governor



January 22, 2018

California Air Resources Board, Members
1001 I Street, Suite
Sacramento, CA 95814

RE: Proposed Innovative Clean Transit Regulation

Chair Nichols and Members of the California Air Resources Board:

On behalf of the California Transit Association, I write to you today to express our **significant** concerns with your body's regulatory approach to electrifying California's public transit bus fleet. This approach, first presented to us in December 2017 as the proposed Innovative Clean Transit (ICT) regulation and now being offered for adoption in June 2018, would compel transit agencies with more than 100 vehicles to purchase zero-emission buses (ZEBs) upon their next procurement, beginning 2020. This "purchase mandate" would initially require that a quarter of new buses procured by these larger agencies be zero-emission, and would increase every three years until all buses procured by an agency, no matter its size, are zero-emission, beginning 2029. We know the proposed ICT regulation, like the proposed Advanced Clean Transit (ACT) regulation that preceded it, will be costly, yet it is being pushed by ARB staff without a validated account of its total costs to the state or to individual transit agencies, and without regard to the various funding and/or operational constraints these agencies face.

As we have expressed to you in written communications dating back to 2015, countless public workshops, and one-on-one conversations with you and your staff, we support an incentive-based approach to integrating additional ZEB technology into transit fleets; we believe a purchase mandate is the wrong approach for an industry such as ours, which has limited resources and a primary objective of providing mobility. With that in mind, we have taken various steps to bolster demand for ZEB technology and to reduce the cost of ZEB deployment for transit agencies. More specifically, we have successfully advocated for increased state and federal funding to offset the upfront capital costs of ZEBs, become an active party to a proceeding at the Public Utilities Commission to advocate for investments in heavy-duty charging infrastructure, and are funding research on a new electricity rate structure that would be truly supportive of widespread transit electrification.

We believe that to be successful and to avoid predictable impacts, such as cuts to transit service, as well as currently unknowable impacts to transit operations, any shift to ZEB technology must be done:

- **Methodically**, with full consideration of, and clear solutions to, barriers outside the control of transit agencies (e.g. the high upfront capital costs of zero-emission buses and

charging infrastructure, the excessive costs of electricity relative to conventional fuels, and the untallied costs of retraining maintenance workers and bus operators);

- **Iteratively**, evaluating cost and operational data as it is collected from real-world ZEB deployments as well as changing funding landscapes, and allowing for adjustments to long-term targets based on budgetary, operational and technology feasibility; and,
- **In a Manner That Retains Local Decision-Making** to allow the public servants who manage and operate our transit agencies to make operational investments and procurement decisions that avoid the operational impacts that could result from an overly-prescriptive and forced transition to ZEB technology.

With the introduction of the proposed ICT regulation, you are ignoring these recommendations, which represent the collective thinking of Chief Executive Officers, General Managers and Chief Operating Officers of public transit agencies across the state and which have been shared with you in various communications and forums, in favor of a framework developed by ARB staff and supported by environmental organizations who, respectfully, lack the depth of our members' knowledge and experience in transit operations.

We believe strongly that proceeding with the ICT regulation, as currently proposed, would: prove to be costlier and more onerous than is suggested by your staff; undermine efficient transit operations, possibly leading to service cuts; and/or, require the diversion of existing transit funding, such as the recently-enacted funding from Senate Bill 1 (Beall and Frazier) from its intended purpose. Additionally, due to the inclusion of several poorly thought-out and new provisions, the proposed regulation could harm ADA-compliant service to elderly and disabled populations, and limit the effectiveness of transit agencies in responding to natural disasters and emergencies. Moreover, at a time when vehicle miles traveled is rising, transit funding is being threatened with repeal and transit agencies are losing ridership to upstart transportation companies, the notion that the state would elect to saddle transit agencies with added capital and operational costs that detract from funding transit frequency, reliability and safety is counterproductive and wildly out-of-step with the state's objective of inciting mode shift. We posit that, while investments in cleaner vehicle technologies are vital to reducing emissions and improving air quality, our communities and our air are better served by transit improvements that expand mobility options and encourage Californians to forego single-occupancy car travel.

The comments that follow, while not an exhaustive account of all the questions and concerns that our membership has about the proposed regulation, are intended to demonstrate the significant flaws in staff's proposal. Because these comments require different forms of response and/or corrective action, we separate our comments between those pertaining to the presentation of facts in the Discussion Document and those related to the design of the proposed regulation.

The following comments pertain to the presentation of facts in the Discussion Document.

The Discussion Document Misleads on the Total Cost of Ownership of ZEBs: In December 2015, the ARB-convened Transit Agency Subcommittee established a Lifecycle Cost Modeling Subgroup (LCMSG), comprised of members of the subcommittee, to research and estimate the costs of the then-proposed Advanced Clean Transit regulation. The goal of the subgroup was to develop objective, data-driven estimates of the regulation's costs to inform a

cost/benefit analysis of the regulation in comparison to alternative strategies. To that end, the subgroup was populated with transit professionals representing a broad swath of industry expertise ranging from small to large transit agencies and agencies that have experience with a variety of vehicle fuel strategies – natural gas, diesel, diesel-electric hybrid, hydrogen fuel cell, and both slow and fast charge battery-electric.

Although the Subgroup worked closely with ARB staff for two years to estimate the total cost of a statewide transition to ZEB technology, **ARB staff chooses to ignore the Subgroup’s findings which suggest a required investment of \$3.2 billion to \$6.5 billion to achieve full electrification by 2040. It should also be noted that, if hydrogen fuel cell technologies are pursued, the cost of electrification could be higher. These findings are broadly substantiated and corroborated by independent scientific study and empirical data collection by entities such as the National Renewable Energy Laboratory (NREL) and the University of California Institute of Transportation Studies (ITS), among others.**

Rather than affix a total cost to the regulation, the Discussion Document evaluates the cost of ZEB technology over conventional technologies on a per-vehicle-basis. In doing so, the Discussion Document misleadingly makes the case that total cost of ownership (TCO) of battery-electric buses is less than that of the conventionally powered fleets currently in service by consistently understating the values for the primary cost drivers of transit electrification. For example, fuel and maintenance are primary cost drivers for any transit fleet, regardless of propulsion strategy. The most recent empirical study by NREL¹ indicates that maintenance costs are 4.5% lower for electric versus compressed natural gas (CNG) buses and a recently released ITS study² indicates that maintenance costs for electric buses could be as much as 10% lower in some circumstances, but equal to conventional technologies in others. Page 9 of the ARB Discussion Document claims a \$10,000 per year savings in maintenance cost for electric buses. This figure, normalized to a bus that costs \$0.85 per mile to maintain and travels 40,000 miles per year, indicates that the Discussion Document assumes a 29.4% maintenance cost savings by switching to electric over CNG, even though all evidence contradicts such wildly optimistic assertions.

The Discussion Document similarly understates the cost of electricity as fuel, a key component of transit bus TCO. In the NREL study², the per mile cost for electricity was \$0.41 per mile, compared to \$0.25 per mile fuel cost for the CNG control fleet, yet the Discussion Document claims a \$5,000 per year savings in fuel costs *before fuel subsidies (LCFS) are accounted for*. The Subgroup’s work found that, while operation and maintenance costs may be lower for electric buses in some cases and higher in others depending on local utility rate structures and usage patterns, they are not significantly low enough in any case to offset the upfront capital investment in more expensive buses, more buses to meet service needs, and costly infrastructure.

As we have suggested previously, we strongly urge ARB to retain an independent third party to evaluate and reconcile the wildly divergent TCO conclusions reached by ARB

¹ NREL Technical Report 5400-67698 June 2017

² *Exploring the Costs of Electrification for California’s Transit Agencies*, Ambrose, et. al., University of California Institute of Transportation Studies, October 2017

staff and the Subgroup. This analysis must be completed before ARB institutes a ZEB purchase mandate.

The Discussion Document Misleads on Potential Funding and Incentive Opportunities: Pages 7, 8 and 9 of the Discussion Document present potential funding and incentive opportunities that support ZEB deployment.

The breadth of this section is intended to demonstrate that funding to support the proposed purchase mandate is readily available. A reader who tallied the funding available in the programs listed, could be left with the impression that approximately \$4.4 billion is available in Fiscal Year 2017-18 for the purchase of ZEBs and charging infrastructure.

In actuality, \$2.4 billion of the \$4.4 billion total is dedicated to a competitive grant program that heavily favors rail and other fixed guideway projects (Transit and Intercity Rail Capital Projects); \$250 million is dedicated to a competitive grant program that is designed to relieve congestion (Solutions for Congested Corridors); \$250 million is overseen by air quality management districts to fund projects, at their discretion, that reduce air contaminants and criteria pollutants (AB 617); and, \$120 million is dedicated to a formula program designed to increase transit service (Low Carbon Transit Operations program).

A clear majority of the remaining funding opportunities identified, inclusive of the \$750 million for the SB 350 transportation electrification proceedings and the \$423 million in the Volkswagen Environmental Mitigation Trust do not yet clearly support ZEB deployment. As noted in the Discussion Document, the \$750 million earmarked for charging infrastructure must first be approved by the PUC and then transit agencies would need to be selected, among competing heavy-duty applications, by the investor-owned utilities for investment. None of the \$750 million is specifically set aside for transit electrification. Additionally, while transit electrification is an eligible use for the \$423 million in the VW Mitigation Trust, ARB has not yet released its funding plan for the Mitigation Trust.³

Only the \$188 million in the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Program (HVIP), with a minimum required investment of \$35 million in zero- and near-zero buses, specifically supports ZEB deployment. Importantly, funding for HVIP fluctuates wildly year-over-year and is subject to an annual appropriation by the State Legislature.

We recommend that ARB staff revise this section to separate the funding that is earmarked specifically for ZEB deployment, the funding for which ZEB projects can apply, and funding on the horizon that has not yet been appropriated or directed.

The Discussion Document Misleads on Transit Agencies' Commitments to ZEBs: Page 5 of the Discussion Document states the following: "Seven transit agencies with over 3,400 buses, representing 25 percent of all buses in California, have committed to fully electrify their fleets. Six of these agencies have set a goal of making the transition long before 2040."

The inclusion of this language is intended to suggest to you and the public that ZEB technologies are ready for deployment in most contexts, and that transit agencies that have failed to commit to electrifying are doing so despite evidence of the viability of ZEB

³ The California Transit Association has formally requested that 75% of funding in the VW Mitigation Trust be invested in the deployment of zero-emission buses and trucks. To date, we have heard only that a priority for this Board is investment in zero-emission school buses.

technologies. We believe it is important to clarify that at least two of the agencies cited, representing 2,555 of the 3,411 ZEB commitment, have stated plainly that their commitments communicate long-term and aspirational targets, and do not detail specific plans to electrify. One of these agencies, the Los Angeles County Metropolitan Transportation Authority (LA Metro), will begin testing ZEB technology on two fixed-guideway routes in 2020, and will decide on the appropriateness of electrifying their other 160 routes, following an evaluation of the operational performance of ZEBs and based on a ZEB technology assessment completed in 2020. LA Metro has made clear that complicating their long-term plans are a lack of charging infrastructure, the need to negotiate with utility companies and the PUC an electricity rate structure supportive of ZEB deployment, the absence of battery ranges that meet, on average, a range of at least 250 miles, and the lack of clear funding and/or financing for the project.

We recommend that ARB staff revise this section of the Discussion Document to better represent the status of transit agencies’ commitments to ZEBs, and acknowledge that nothing in the proposed regulation addresses the barriers to electrification identified by the agencies most committed to ZEB technology.

The following comments pertain to the design of the proposed regulation in the Discussion Document.

The Proposed Regulation’s Purchase Mandate Begins Too Soon After the Proposed Adoption of the Regulation: Page 12 of the Discussion Document outlines the purchase mandate schedule that would be instituted if the regulation is adopted. It is as follows:

| Starting January 1 | Percent of Bus Purchases | Fleet Size as of 2019 |
|---------------------------|---------------------------------|------------------------------|
| 2020 | 25% | >100 buses |
| 2023 | 50% | >30 buses |
| 2026 | 75% | All Fleets |
| 2029 | 100% | All Fleets |

Because the purchase mandate would begin in 2020, just 18 months after the proposed adoption date of the regulation, an agency that has already begun a procurement that is scheduled to be executed in 2020, would be forced to abandon or rescope it, if it does not include an adequate ZEB component. This process would waste limited staff resources, and would require the agency to identify new funding to support ZEB deployment, including for the purchase of the ZEB, charging infrastructure, electricity demand management technologies, and workforce development and training. For some agencies, ZEB deployment will require the diversion of existing federal, state and local funding from its intended purposes, such as capital replacement, maintenance and rehabilitation and operations. The inability to identify such funding because of a lack of availability or access (see below) would delay procurements, impacting the provision of transit service.

We recommend that ARB staff further engage with transit agencies on establishing a more appropriate mechanism and timeline for encouraging the deployment of ZEBs.

The Proposed Regulation Would Prohibit the Use of Incentives to Meet Compliance: Page 12 of the Discussion Document, in outlining various procurement paths that a transit agency could take to comply with the purchase mandate, states unequivocally that HVIP and “other

incentive programs,” which ARB controls, would not be available to agencies to purchase buses that meet only baseline ZEB purchase targets. In other words, if an agency is procuring four buses and is required to purchase one ZEB as part of that procurement (under the 25% purchase mandate that begins 2020), the agency would have to bear the full cost of the ZEB and would be disallowed from using incentives to offset the incremental cost of the more expensive technology.

ARB staff has stated that this provision to bar the use of incentives to meet regulatory compliance is consistent with ARB policy, and has stated that incentive programs will remain available to agencies that take early actions on ZEB deployments or that exceed their baseline ZEB purchase targets. That is, the agency in the scenario we presented above could access incentives to purchase a second, third or fourth ZEB, or to purchase ZEBs before the 2020 requirement.

We fully understand that this provision is intended to encourage early and/or more aggressive ZEB deployment, while still adhering to ARB’s policy of not using incentives to fund compliance. However, its fatal flaw is that it presumes flexibility in the procurement timelines and decisions of a transit agency. In truth, these timelines and decisions are dictated by factor such as the useful life of an agency’s transit fleet – per Federal Transit Administration guidelines, buses purchased with federal funding must remain on the road for twelve years – and funding availability. If this provision remains, we foresee a possible complication where a transit agency is unable to begin a procurement until, for example, 2024 as is the case with one of our members, County Connection, and they are precluded from accessing incentive funding to comply with any aspect of the purchase mandate. In this scenario, the agency’s late procurement date occurs due to forces beyond the transit agency’s control, and they are penalized arbitrarily by the state. This may mean that the transit agency will find itself either out of compliance with the purchase mandate, or forced to redirect the limited fungible resources they have from other worthwhile purposes.

Beyond this complication, we have concerns that ARB’s policy on the use of incentives to meet regulatory compliance may undermine transit agencies’ access to other state funding sources, like those outline on pages 7, 8 and 9 that fall outside the control of ARB.

We recommend that ARB staff strike this provision, recognizing the importance of maintaining incentive funding for transit agencies to avoid the diversion of limited transit funding from their intended purposes. Regardless of ARB staff’s ultimate position on our recommendation, we request that ARB staff clarify in writing – and with input from the administering agencies – what, if any, impacts the purchase mandate and ARB’s policy on incentives would have on access to state funding sources outside of ARB’s control.

The Proposed Regulation’s Applicability to Cutaway Buses and Discounting of Electric Trolley Buses is Problematic: Page 11 of the Discussion Document states the following: “The regulation would apply to all public transit agencies that own, lease or operate buses with a gross vehicle weight rating greater than 14,000 lbs. Buses subject to the regulation include cutaway buses, transit buses (including rapid transit buses), articulated buses, double-deckers, commuter coaches, trolley buses and vintage trolley buses.”

While we have myriad concerns about the purchase mandate at the center of the proposed regulation, its applicability to cutaway buses is surprising and problematic. Battery-electric cutaway buses are a nascent technology and, to the best of our knowledge, have not yet been

approved for purchase with federal funding. Cutaway buses are critical to providing service in low-density rural areas and to persons with who qualify for paratransit service under the Americans with Disabilities Act. Additionally, unlike fixed route operations, FTA regulates the paratransit operating environment providing explicit requirements for pick up windows, denial of service as well as acceptable travel times. In the dynamic operating environment of paratransit services these unproven new buses could result in unintended violations of ADA law. Therefore, if the regulation is adopted as proposed, ARB risks undermining service to vulnerable populations.

Additionally, we will note that the applicability of the regulation to cutaways is a new feature, which was not previously discussed between ARB and transit agencies in the more than two years of meetings, discussions and workshops we have engaged in.

Finally, a footnote on page 12 of the Discussion Document states the following: “Trolley buses operated on fixed guideway are ZEBs but would not be counted towards ZEB purchase requirements.” While this issue impacts few of our transit agency members, we see no justifiable reason for ARB staff to take this position. The use of electric trolley buses clearly and unequivocally advances ARB’s goal of reducing GHG emissions and improving air quality, and help navigate difficult topography, which cannot yet be managed by battery-electric technology.

We recommend that ARB staff eliminate the proposed regulation’s applicability to cutaway buses and engage in a larger conversation with transit agencies about the types of buses that would be subject to the regulation.

The Proposed Regulation’s Must Institute an Initial Review of Technology Readiness and Funding Availability and Establish a Schedule for Constructive Periodic Reviews: The Executive Summary of the Discussion Document states that ARB would “...conduct periodic informational updates to the Board. The first informational update to the Board would be around 2022 to assess zero emission technology, fleet experiences, costs, and to evaluate the regulatory structure for achieving mobility improves and a complete transition to a zero-emission future. The informational updates to the Board would provide an opportunity to discuss any needed adjustments.”

We have long-stated that data collection and review should be the hallmark of any regulatory action on ZEBs. We stand by this assessment, and believe that an initial review of technology readiness and funding availability is necessary – before the purchase mandate goes into effect – to determine the appropriateness of proceeding with the regulation. Additionally, we believe the schedule for period reviews must be established alongside transit agencies, so that these events provide useful insight into the continued viability of the regulation. For example, the proposed date of 2022 for an informational update to the Board may too early to give an accurate and complete picture of transit agencies’ experience with ZEBs. At that point in time, few, if any, ZEBs procured because of the purchase mandate will be delivered and on the road, and the data that will be in hand would provide only limited utility. Finally, we believe each period review must also examine any changes to the funding landscape.

We recommend that ARB staff further engage with transit agencies on establishing an appropriate timeline for an initial review of technology readiness and subsequent informational updates to the Board.

The Proposed Regulation's Off-Ramp Provision Requires Further Development: Pages 13 and 14 of the Discussion Document outline conditions faced by a transit agency that could result in a temporary delay of the purchase mandate. These conditions broadly speak to challenges, outside of an agency's control, related to electrical power, hydrogen refueling infrastructure, local permitting and vehicle availability.

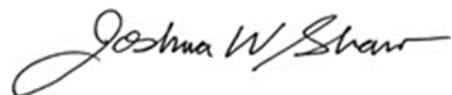
We have long-supported off-ramp provisions that provide relief for transit agencies facing extraordinary circumstances. We, therefore, maintain our general support for this provision, while arguing that, if the proposed regulation is implemented, there are likely to be other circumstances that require administrative intervention and clemency. These circumstances may include a transit agency's financial position, the unavailability of cost-effective ZEB technology to meet service needs, and space constraints for charging infrastructure. The last of these is, for example, dismissed by ARB staff on page 14 of the Discussion Document with the statement that "concerns about space constraints for charging infrastructure in the depot may not be an issue for smaller or larger deployments because of overhead charging solutions that have minimal impact on congested yards." At this time, overhead charging solutions are a *theoretical concept* that transit agency representatives have discussed as a potential solution to the daunting and yet unanswered question of how to manage the footprint of the sizable electrical infrastructure required for broader deployments. To our knowledge, no one has performed a feasibility study, much less designed or built an overhead charging system for electric bus charging, yet, we see it offered in this document as a ready solution.

We recommend that ARB staff further engage with transit agencies on identifying circumstances that may need to exercise the off-ramp provision. Additionally, we believe that the off-ramp process must be clearly defined, with input from transit agencies, before any regulatory action is taken.

Given the absence of validated total cost for the proposed Innovative Clean Transit regulation, the precarious nature of funding to support the transition to ZEBs, and myriad issues with ARB staff's proposal, we respectfully request that this body table consideration of the proposed regulation in June 2018. As we have done before, we will emphasize that a purchase mandate is not an appropriate mechanism for encouraging ZEB deployment, and will invite ARB to work with us on identifying, and advocating for solutions to, the barriers to transit electrification. Should ARB proceed with the ICT regulation against our advisement, it should do so only after validating its costs and working through the issues we have identified as well as the various issues that our individual member agencies bring forward.

Please contact Legislative and Regulatory Advocate Michael Pimentel at 916-446-4656 or at michael@caltransit.org, if you have any questions or comments about the Association's position on this regulation.

Sincerely,



Joshua W. Shaw
Executive Director

cc: Alice Reynolds, Senior Advisor, Office of Governor Edmund G. Brown, Jr.
Richard Corey, Executive Officer, California Air Resources Board
Steve Cliff, Deputy Executive Office, California Air Resources Board
Jack Kitowski, Chief, Mobile Source Control Division, California Air Resources Board
Tony Brasil, Branch Chief, Heavy Duty Diesel Implementation Branch, California Air Resources Board
Shirin Barfjani, Air Pollution Specialist, Mobile Source Control Division, California Air Resources Board
Yachun Chow, Manager, Zero Emission Bus Truck and Bus Section, California Air Resources Board
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Members, Executive Committee, California Transit Association
Members, Zero Emission Bus Task Force, California Transit Association



Metro

Los Angeles County
Metropolitan Transportation Authority

One Gateway Plaza
Los Angeles, CA 90012-2952

Attachment B

213.922.2000 Tel
metro.net

January 22, 2018

Tony Brasil and Shirin Barfjani
California Air Resources Board
1001 I Street, Suite
Sacramento, CA 95814

Dear Tony and Shirin:

On December 15, 2017, California Air Resources Board (CARB) conducted a public workshop on the proposed Innovative Clean Transit (ICT) Regulation. As part of the materials for this workshop CARB released a discussion document¹ that provides an overview of CARB's current understanding of the Zero Emission Bus (ZEB) technology and the elements of the proposed ICT regulation. On behalf of Los Angeles County Metropolitan Transportation Authority (LACMTA), we present the following comments on CARB's discussion document that express our concerns on CARB's assumptions about ZEBs and the proposed regulatory language:

1. CARB's discussion document presents an overly positive picture of the status of battery electric bus (BEB) technology. Statements throughout the document indicate that BEBs have been demonstrated successfully to cover the same range as a conventional bus, and can provide significant cost savings compared to conventional buses. This is contrary to our recent experience with operating BEBs. LACMTA acquired five BEBs from BYD in 2015. Due to major issues with performance, reliability, and maintainability, BYD bought these buses back in 2016 and issued LACMTA a credit to be used in future procurements of BEBs from them. The following sub-bullets highlight these issues, and demonstrate that LACMTA's experience is at odds with CARB's assessment that this technology has already been proven in service and is ready for mass scale deployment as early as 2020:
 - a. BYD's BEBs had an advertised daily range of 155 miles. This range was never achieved in practice. In fact, the average in-service daily range across all five buses was only 50 miles, which is less than a third of the advertised daily range. The longest daily range achieved in service on these buses was 132 miles. In order to achieve this range, constant coordination between the operator, dispatchers, and maintenance staff was required, and the operator had to continue driving while the low battery power light was illuminated on the dashboard.
 - b. At the time of delivery, only depot overnight chargers were available. Each bus received its own charger which required setting aside limited yard space to pour five concrete pads and protection bollards for each charger. Additionally, the chargers required new electrical service (switch gear, fuse panel, trenching, and junction box) that resulted in an additional expense of over \$300,000 for just five buses (\$60,000 per bus).
 - c. The BEBs were built with a powertrain of 90Kw, which wasn't powerful enough to meet the requirements of our service. Specifically, the buses couldn't climb the short hills on

¹ Available at: <https://arb.ca.gov/msprog/ict/meeting/mt171215/171215ictconcept.pdf>. Accessed: December 2017.

our downtown routes. This resulted in vehicles becoming stuck on the hills during high traffic periods, and at times necessitated backing into an intersection to gain enough momentum to crest the hill.

- d. Integration of new technology resulted in very poor reliability. The BEBs lost excessive days of operation, having a mean miles between road calls of less than 400 miles as compared to an average of 3,700 miles for the rest of the fleet.
2. On Page 2 of the discussion document CARB states that, "Several manufacturers now offer BEB with a nominal range exceeding 200 miles and at least one with 300 miles per charge." These data on Battery Electric Bus (BEB) ranges are based on claims made by BEB manufacturers for future models and have not been verified in practice. As stated in Comment #1, our recent experience with the BEBs clearly shows that advertised ranges such as these are rarely achieved in practice. Hence, it is misleading to state such data without appropriate caveats. Furthermore, based on manufacturer-stated gross vehicle weight rating these buses with higher range have limited passenger capacity compared to diesel and CNG buses. For heavily-used routes, the use of these buses would require agencies to put more buses on the street to carry the same passenger load, thus increasing cost. CARB's discussion document fails to mention this fact.
3. On Page 2 of the discussion document CARB states that, "Despite their higher capital costs, today, when BEBs (with a nominal range of 150 miles) are replaced on a one-for-one basis in California, the operational savings can make the total cost of ownership comparable to conventional buses even without incentives." CARB's assertion that the cost of BEBs is lower than conventional buses is based on the incorrect assumptions that conventional buses can be replaced on a one-for-one basis by BEBs, and that the maintenance costs for BEBs are 29% lower than CNG buses². As stated in the September 2016 version of Zero Emissions Bus Options Analysis ("ZEB Analysis") for the LACTMA fleet³ and the memorandum submitted by Ramboll and M. J. Bradley & Associates to CARB on June 23, 2017 ("June 2017 Memo")⁴, if we assume that BEBs have a range of 161 miles (which is around 11 miles greater than CARB's assumption of 150 miles), the BEB replacement ratio for the depot charging-only scenario would be 1.08 for the LACTMA fleet. Ramboll and M. J. Bradley & Associates have been working on an updated version of the ZEB Analysis, which assumes the nominal range for BEBs would be 160 miles in 2015 increasing to 210 miles by 2045⁵. Even with these assumptions, the draft results show that projected total LACTMA fleet costs from 2018-2055 would be \$0.2 to \$0.6 billion higher for electric bus scenarios⁶ as compared to the baseline⁷. As for the maintenance costs,

² Available at: <https://arb.ca.gov/msprog/ict/meeting/mt170626/170626costdatasources.xlsx>. Accessed: January 2018.

³ Available at: <http://metro.legistar.com/gateway.aspx?M=F&ID=dc25674f-e42f-41ab-b433-76988b3abe81.pdf>. Accessed: December 2017.

⁴ M. J. Bradley & Associates and Ramboll Environ. Response to Questions Received During the Transit Agency Subcommittee Cost Sub-Group and California Air Resources Board Meeting Dated April 28th, 2017. Submitted via electronic email to Tony Brasil and Shirin Barfjani on June 23, 2017.

⁵ 160 mile for model year 2018 to 2024, 190 miles for model year 2025 to 2034, 200 miles for model year 2035 to 2044, and 210 miles for model year 2045 to 2054.

⁶ Battery electric bus scenarios include depot charging only and in-route charging only scenarios. For each scenario, electric bus purchased begin in 2018 and the fleet is converted into all electric fleet by 2035.

⁷ The baseline includes the following assumptions: use of 100% RNG as of 2018, all new natural gas buses to have "low NOx" engines and electric accessories, existing natural gas buses re-powered to low NOx engine at mid-life, and 128 electric buses purchased for delivery 2018 – 2020.

the analysis presented in the June 2017 Memo clearly shows that BEB maintenance costs are expected to be only 12% lower than CNG buses, as opposed to the 29% reduction assumed by CARB. Further, our recent experience with BEBs (Comment #1) indicates that the initial models of the BEBs would require a lot of troubleshooting and maintenance that could effectively eliminate any estimated maintenance savings. Hence, we believe that CARB's statement on cost of ownership for BEBs is incorrect and misleading.

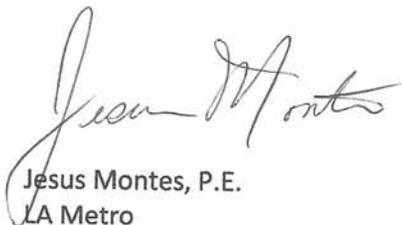
4. CARB discussion document does not address issues with the existing electrical infrastructure. If transit agencies convert their fleet to BEBs they would be dependent on the power grid and infrastructure provided by the utilities. CARB should assess whether there are areas where secondary distribution systems will need to be upgraded to accommodate electric buses.
5. There is currently no standardization for BEB charging stations. Even if standardization occurs in the future, there may not be interoperability between charging stations for BEBs from different manufacturers. This is a potential issue for transit agencies choosing to convert to a BEB fleet with in-route charging. It could drive up infrastructure costs and create operational issues for fleets that operate BEB buses from different manufacturers.
6. In Table 2 (Page 6) of the discussion document CARB provides production capacities for various Zero Emission Bus (ZEB) manufacturers. These capacities do not represent actual production rates and are merely projections for the future. For example, the production capacity for the BYD manufacturing facility in Lancaster is shown as 1,500 buses per year; however, this BYD facility has produced less than 500 buses in the entire time it has been operational and is having issues meeting delivery deadlines. It could take manufacturers several years to achieve maximum capacity at their manufacturing plants, as they go through the process of obtaining sufficient orders and troubleshooting issues with production in early years of plant operation.
7. Section IV (Page 7 through 10) of this discussion document provides a series of funding/incentive opportunities for ZEBs. Unfortunately, most of these funding opportunities (Transit and Intercity Rail Capital Program (TIRCP), Low Carbon Transit Operations Program (LCTOP), Congested Corridors Program under SB 1, Volkswagen Environmental Mitigation Trust, AB 617, and SB 350) have uses that extend beyond ZEBs and do not have a firm commitment for even a portion of their funds being directed specifically towards ZEBs. The dollar amounts shown in CARB's discussion document represent the total funding available under these programs and do not represent actual funding for ZEBs. It is also important to note that funds for Volkswagen Environment Mitigation Trust and SB 350 have not been appropriated, so funding from these sources is currently not available. It would be helpful if CARB provides further analysis of actual funds most likely to be available for ZEBs in the timeframe anticipated by the rulemaking, to include only funding that would be available for ZEB purchases that are required by CARB regulation.
8. The proposed ICT regulation (Page 10 of discussion document) fails to define what the implementation dates in the regulation represent. Do these dates represent the date on the purchase contract, the date of issue of the purchase order, or the date of delivery of the buses? We propose that these dates represent that date of the purchase contract as dates of issuance of the purchase orders and bus delivery dates could vary with delays in bus production.
9. On Page 12 of the discussion document, CARB states that only early ZEB purchases would be eligible for funding/incentive programs like the Clean Truck and Bus Vouchers (HVIP + Low NOX Engine Incentives). As stated in item # 8 of the proposed ICT regulation, the implementation schedule for the proposed regulation begins in 2020. This means that for large transit agencies like LACTMA early purchases would have to be completed within two years, by December 31st, 2019. Starting in 2020, ZEBs required by the regulation will not qualify for the funding/incentives. Only purchases of

additional ZEBs beyond those required by the regulation would qualify for funding/incentives. This defeats the purpose of the funding/incentive programs that have been set up to assist transit agencies with the high capital costs involved in ZEB purchases.

10. On Page 13 and 14 of the discussion document, CARB lists a series of proposed conditions that would be approved for temporary delays. We suggest that a simple and efficient mechanism such as an online submission portal be established for the implementation of the same.
11. On Page 14 of the discussion document CARB states that, "concerns about space constraints for charging infrastructure in the depot may not be an issue for smaller or larger deployments because of overhead charging stations that have minimal impact on congested areas." This statement is not accurate. We believe that overhead charging stations would also need additional space, which may not be available in congested depots. Further, transit agencies that chose to implement in-route charging would have to purchase or lease property for installation of in-route chargers.
12. As stated in the Executive Summary, CARB has proposed an information update to the board in 2022. During this update, CARB propose to assess zero emission technology, fleet experiences, cost and the regulatory structure for achieving mobility improvements and a complete transition to a zero emission future. 2022 seems too early for this update, it will be only two years since the purchase requirement goes into effect and many transit agencies may not have operated the ZEBs for more than a year.
13. The discussion document does not address enforcement actions for non-compliance with proposed ICT regulation. We request that CARB provide information about the same.

We appreciate the opportunity to submit comments on the proposed ICT regulation and are available for further discussion with CARB on the issues raised in this comment letter. LACTMA has also reviewed the comments submitted by the California Transit Association and is in concurrence with the same.

Sincerely,



Jesus Montes, P.E.

LA Metro

Sr. Executive Officer, Vehicle Acquisition

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February 9, 2018

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Ms. Mary D. Nichols, Chair
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812-2815

RE: Proposed Innovative Clean Transit Regulation

Dear Ms. Nichols:

Thank you for the opportunity to provide comments on the proposed Innovative Clean Transit (ICT) regulation recently unveiled by California Air Resources Board (CARB) staff. The Metropolitan Transportation Commission (MTC) is the metropolitan transportation planning and funding organization for the nine-county San Francisco Bay Area. MTC is also the designated recipient of federal formula funds in the region, and distributes Federal Transit Administration funds to 22 independent transit operators to help achieve and maintain a state of good repair by, among other things, procuring new buses when fleets are due for replacement.

MTC shares CARB's goals of reducing GHG and other emissions through electrification of transit fleets, and is supportive of constructive policies that would accelerate the transition to zero-emission buses (ZEBs). The transition is already underway in the Bay Area: SFMTA has long operated the largest fleet of zero-emission electric trolley buses in the nation, AC Transit has been the national leader in the development and deployment of hydrogen fuel cell electric buses (FCEBs), and several other agencies in the region now have battery electric buses (BEBs) in service or on order.

MTC has been working with the operators and the Bay Area Air Quality Management District to identify policies and funding options that would fast-track greater deployment of ZEBs in the region. Our agencies recognize that the state of the art in ZEB technology has come a long way in recent years, and there is a general – but not complete – consensus that the barriers to more widespread ZEB deployments are primarily financial, not technical.

To help overcome the financial obstacles, later this month the MTC Commission will consider adopting a policy for new SB 1 programs that prioritizes ZEBs for funding from the new State Transit Assistance State of Good Repair program. The STA funds would be used to pay for the cost increment of ZEBs over diesel or hybrid vehicles or for charging or hydrogen infrastructure to support ZEBs in the Bay Area. Staff is working with the Air District in an effort to leverage this investment with their funding to be able to accelerate the conversion of the transit fleet toward zero emission. With a 1:1 leverage, the region could replace roughly 65 buses with ZEBs annually based on current ZEB costs; while this is progress, it is insufficient to fully fund the incremental costs of replacing the entire Bay Area transit fleet with ZEBs.

In MTC's view, a ZEB purchase requirement as proposed in ICT may be an effective way to accelerate ZEB adoption, but only if:

- ZEB capital costs come down;
- Lower electrical rates for charging ZEBs are approved;
- Reliable funding is available to help operators meet the mandate; and
- Bus service requirements can be achieved (range, hill-climbing, reliability, durability).

Therefore, we urge CARB to consider several issues before adopting the ICT regulation.

1. Cost Issues

The ICT proposal acknowledges that ZEBs have higher capital costs than conventional buses, especially for charging/fueling infrastructure. We have several concerns related to ZEB costs. First, prices will drop as production volumes increase, but how much and how fast is unknown.

Second, CARB's ICT presentation includes an analysis of the total cost of ownership – capital and operating – of a BEB that concludes that operating cost savings would more than offset the higher capital cost of the bus and charger over the life of the bus. However, transit operator staff working together in CARB's Transit Agency Subcommittee used data from actual Bay Area ZEB deployments to develop a detailed cost model that reaches the opposite conclusion, in large part because of differing assumptions on electricity costs, which several transit agencies have identified as the largest barrier to BEB implementation.

Third, although the ICT proposal acknowledges that the capital costs of FCEBs and hydrogen fueling infrastructure are even higher than for BEBs, and provides extra credits for FCEB purchases, this provision extends only through 2022.

To help address these valid concerns about costs, MTC recommends:

- Commission an independent third party to evaluate the costs and savings of the ICT proposal, using real world data from actual ZEB deployments to the extent possible, and use the results of the analysis to inform potential revisions to the proposal;
- Partner with the California Transit Association in their efforts to develop more affordable electric rates for charging BEBs;
- Extend the bonus credits for FCEB purchases until 2040 or the point where FCEB costs are comparable to BEB costs, whichever comes first.

2. Funding Issues

Throughout the long development of the ICT proposal, MTC staff has suggested a basic funding framework for ZEB implementation: use FTA formula funds for the cost of replacing buses with conventional buses, and seek other sources for the incremental costs of ZEBs and for charging and fueling infrastructure. This approach would avoid diverting limited FTA funds, which are already heavily oversubscribed, and negatively impacting the state of good repair of transit fleets and infrastructure.

CARB staff's proposal identifies several funding programs that could be used for incremental ZEB costs. However, most of the funding sources, e.g., the Transit & Intercity Rail Capital Program (TIRCP) and the Low Carbon Transit Operations Program, can be used for a variety of transit capital and operating purposes, so using those sources for ZEBs would compete with other critical needs.

In addition, most of the cited funding sources, such as TIRCP, the Solutions for Congested Corridors Program, and CARB's Heavy Duty Zero Emission Commercial Deployment Program (Heavy Duty Program), are

discretionary programs with projects selected for funding by state agencies, not transit operators. Operators need a predictable and reliable source of funds for recurring costs such as ZEB procurements. Moreover, mandating the procurement of ZEBs may make ZEB projects less competitive for discretionary funding programs, which tend to reward voluntary initiatives to expand or improve services.

Two of the funding sources cited in the ICT proposal are or could be focused on ZEB procurements – CARB’s Hybrid Voucher Incentive Program (HVIP) and the Volkswagen Environmental Mitigation Trust. MTC commends CARB for pursuing increased appropriations for HVIP, which allowed the program’s waiting list to be eliminated and voucher amounts to be increased. However, under the ICT proposal, HVIP cannot be used for the cost of complying with the purchase mandate, only for the cost of exceeding the requirements. Our understanding is that the terms of the VW consent decree put similar limitations on the Environmental Mitigation Trust funds. The result of these restrictions is that the act of mandating ZEB procurements takes funds off the table that otherwise would be the best sources for ICT compliance.

In order to avoid negatively impacting transit services and state of good repair by diverting funds from these core functions, CARB should partner with regions and transit operators to develop a predictable funding strategy for the costs of ICT. The SB 1 ZEB funding proposal discussed above illustrates MTC’s good faith efforts to support ZEB implementation, even before CARB adopts its regulation. To support CARB’s participation in the funding plan, MTC recommends that:

- HVIP rules be revised to allow use of vouchers for ZEBs that are mandated under ICT;
- CARB seek funding levels for HVIP that are sufficient to provide vouchers for all ZEBs procured in the state; MTC would support CARB’s advocacy in the Legislature;
- CARB redirect funding from its discretionary Heavy Duty Program to HVIP or a new formula ZEB funding program to provide a reliable, non-discretionary source for ZEBs and related infrastructure;
- CARB make ZEB purchases that exceed ICT requirements a priority for VW Environmental Mitigation Trust funds, and explore whether the VW funds can be used for charging and fueling infrastructure (which would not be directly mandated under ICT), and if so, also make ZEB-related infrastructure a priority for the VW funds;
- If funding levels for HVIP or other CARB funding programs are insufficient to provide vouchers or equivalent funding for all ZEB procurements, provide waivers or deferrals from the ICT purchase requirement.

3. Start Date for ZEB Purchase Requirement

MTC supports CARB’s goal of transitioning all transit buses in the state to zero emission by 2040, but the 2020 start date for the ICT purchase requirement is too soon given the long lead times required to develop specifications and conduct procurements, for both ZEBs and charging/fueling infrastructure. Purchases for 2020 are likely already underway at transit agencies. The schedule for phasing in the purchase requirement should be revised to reflect these realities.

4. BEB Range Limitations

While the range of battery-electric buses has improved considerably in recent years, for most models it is still below that of a conventional bus, and too short for some longer commuter and rural routes. In some cases, it would take two BEBs to replace a single diesel or hybrid bus. Recently announced models with claimed long ranges are unproven and more expensive. In-route charging is costly and difficult to implement on long routes. Fuel cell buses have sufficient range, but their high cost puts them out of reach for many transit operators. Therefore, waivers or deferrals of the purchase requirement should be granted if an operator cannot procure ZEBs that could be used on long-mileage routes.

5. Other Issues

Emergency Response. In last year's North Bay fires, transit buses played a vital role in evacuations despite a power failure at a bus yard caused by the fire. If the operator had been using BEBs, they would have been unable to recharge their buses and continue to provide emergency services. The ICT proposal should address this concern. Providing funding for back-up power supply may be an option.

Cutaways. The ICT proposal applies to all buses and cutaways with a gross vehicle weight over 14,000 pounds, but there are currently few if any proven and FTA-approved zero emission cutaways on the market. Cutaways are often used for paratransit service required by the Americans with Disabilities Act. To avoid harmful impacts on services to senior and disabled riders, the purchase requirement should not apply to cutaways and smaller buses until such vehicles are commercially available.

SFMTA Electric Trolleys. San Francisco's electric trolley buses powered by overhead catenary provide the same or greater GHG benefits compared to other types of ZEBs, but the ICT proposal specifies that "Trolley buses operated on a fixed guideway are ZEBs but would not be counted towards the ZEB purchase requirements except when expanding the existing fleet from a 2015 baseline." Under this provision, replacing existing trolleys with new trolleys would not count toward the ICT requirement. The use of electric trolley buses clearly and unequivocally advances CARB's goal of reducing GHG emission and improving air quality, and helps SFMTA navigate steep and hilly terrain, which cannot yet be managed by battery-electric technology. Counting trolleys as ZEBs for ICT purposes would allow SFMTA to continue to invest in ZEBs while battery-electric technology continues to develop until it can operate in SFMTA's difficult topography.

Joint Procurement Option. MTC supports the ICT provision that would allow multiple transit operators in a region to implement a joint compliance plan and meet the purchase requirements as a group. If ICT is adopted, MTC likely would work with the region's transit operators to develop a joint compliance plan for the Bay Area. However, the proposal includes several requirements for joint plans that do not appear to apply to individual operators, such as providing services in disadvantaged communities. Joint procurements should not have additional hurdles to jump as long as the total number of ZEBs procured in the region is at least as many as would be procured if the operators were complying individually.

MTC looks forward to continuing to work with CARB and the Bay Area transit agencies to support the transition of the region's transit fleet to zero emission. If you have any questions about our comments, please contact Glen Tepke at gtepke@bayareametro.gov or 415-778-6781. Thank you for your consideration.

Sincerely,



Steve Heminger
Executive Director

CC: Bay Area State Legislative Delegation

SH: GT

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Darrell Johnson
Chief Executive Officer

January 22, 2017

Ms. Mary Nichols
Chairman
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Subject: **Comments on Innovative Clean Transit Regulation Discussion Document**

Dear Chairman Nichols:

The Orange County Transportation Authority (OCTA) Board of Directors appreciates the opportunity to offer comments on the California Air Resources Board's (ARB) Innovative Clean Transit Regulation Discussion Document (ICT Proposal), dated December 15, 2017. Since the postponement of the initial zero-emission bus purchase requirement in 2009, OCTA has taken significant steps to integrate new technology within its fleet in an economically sustainable manner, while also allowing for emission reductions and the testing of new technology. This includes obtaining over ten hydrogen fuel cell buses, exclusive use renewable natural gas for the existing fleet, and integration of low nitrogen oxide (NOx) engines, with about 20 percent of the fleet utilizing near-zero emission engines. These actions are over and above the significant emission reductions achieved when OCTA initially converted its fleet to natural gas. Transit agencies throughout the state are taking similar steps towards the integration of new technology. OCTA is therefore hopeful that through collaboration between the ARB and transit agency stakeholders, revisions can be formulated which allow the rule to be implemented in a fashion that is economically feasible, and allows for dependable technology to be developed.

The current ICT Proposal seeks to enact several new requirements which could jeopardize not only existing transit service levels, but present challenges in meeting fleet operating needs. These implications directly contradict the ARB's goals in pursuing the ICT, namely improving transit service and reducing emissions. The comments included on the attached document should be considered as revisions are made to the ICT Proposal.

OCTA appreciates the time and effort ARB staff has taken to meet with all transit agencies statewide to discuss the ICT proposal. Going forward, OCTA hopes to continue discussions with the ARB and develop collaborative solutions that will help reduce emissions and improve transit service statewide. As previously

Ms. Mary Nichols
January 22, 2017
Page 2

discussed, this could include efforts to create a performance-based standard, similar to what was proposed by the California Transit Association. If you or your staff have any questions regarding OCTA's comments, please contact Kristin Essner, Manager of State and Federal Relations, at (714) 560-5754 or kessner@octa.net.

Sincerely,



Darrell Johnson
Chief Executive Officer

DJ:ke
Attachment

c: Members, California Air Resources Board
Richard Corey, Executive Officer, California Air Resources Board
Steve Cliff, Deputy Executive Office, California Air Resources Board
Jack Kitowski, Chief, Mobile Source Control Division, California Air Resources Board
Shirin Barfjani, Air Pollution Specialist, Mobile Source Control Division, California Air Resources Board
Yachun Chow, Manager, Zero Emission Bus Truck and Bus Section, California Air Resources Board
Platinum Advisors

Orange County Transportation Authority Comments on the California Air Resources Board's Innovative Clean Transit Regulation Discussion Document

1. Funding is not identified to bridge the gap between existing technology and zero-emission buses, which could directly impact existing transit service.

The Innovative Clean Transit Regulation Discussion Document (ICT Proposal) would create a new unfunded mandate for transit agencies, without the identification of sufficient resources to compensate for the increased costs that would be needed to implement the proposed purchase requirement. For the Orange County Transportation Authority (OCTA), it is estimated that it would cost an additional \$442 million, at current cost estimates, to convert its fleet to zero-emission technology. This does not include other costs for new fueling infrastructure or increased fuel costs. This estimate assumes not only the cost differential between existing compressed natural gas (CNG) buses, but also the need to increase the fleet size to integrate zero-emission buses (ZEB). OCTA's buses must meet a 300 mile range. Replacing a CNG bus with a ZEB is not a straight one-to-one comparison. Instead, because ZEBs cannot meet existing fleet range requirements, transit agencies will have to expand their fleet to comply with the purchase requirement and maintain existing service.

Already, OCTA has budgeted funding from existing sources, including the Transportation Development Act, State Transit Assistance, cap-and-trade, SB 1 (Chapter 5, Statutes of 2017) and federal transit sources, to maintain existing service levels. Any requirement put in place by the ICT Proposal would have to identify new funding sources, beyond those identified, to bridge the funding gap. Otherwise, transit agencies like OCTA would have to analyze potential service reductions. In order to meet the \$442 million funding gap, OCTA would have to look at reducing service by more than 20 percent; a level surpassing what was done during the last recession. This would not only immediately impact the most transit dependent areas of the state, but may also lead to an increase in vehicle miles travelled, which is counter-productive to other California Air Resources Board (ARB) environmental initiatives.

Most of the funding sources the ARB does identify in the ICT Proposal are either one-time funding pots or have not yet been identified as eligible for ZEB purchases. Furthermore, ARB has stated many of these sources cannot be used once the purchase requirement is enforced. It is unclear which provisions of state law prevent this, or why ongoing sources of funding like the Low Carbon Transit Operations Program, cannot be used.

2. New zero-emission technology has not been implemented at a scale which adequately demonstrates its technological ability to meet existing fleet requirements.

The ICT Proposal cites the availability of ZEBs that would meet a 300-mile range requirement, however, such vehicles have not yet been tested in actual operation. Rather than state that range is no longer an issue for ZEBs, the ICT Proposal should include

evidence of where such vehicles have been put in service and met those range requirements over an extended period of time. It is also unclear whether existing ZEBs will be able to meet the useful life requirements and whether the warranties for parts will be filled later in the vehicle's use. If unable to meet many of these requirements, this could put federal funding into jeopardy.

The ICT Proposal also does not include a discussion about the potential for impacts from increased bus axle weight. State law includes explicit bus axle weight limitations that transit buses must meet to operate on state highways and local streets and roads. The ICT Proposal fails to discuss these impacts, as required under existing state law. This discussion should also include details about the weight of electric buses and the associated range of the buses. Currently, the range cited by ZEB manufacturers do not account for the weight of the bus loaded with passenger, nor the use of air conditioning which greatly reduces the range.

There also is no discussion about electricity costs and how that will vary based on time of day, based on various fleet fueling requirements. Currently there is no certainty about the future of these costs, or what rates will be imposed for transit agencies. Many of the previous demonstrations of this technology were operating under special rate provisions which should not be held as the standard to determine costs for this regulation.

3. The ICT Proposal dramatically expands its application, without clearly demonstrating the existence of the technology being commercially available.

In previous iterations of the ICT Proposal and of a ZEB purchase requirement, the ARB limited its scope of application to urban buses. The current ICT Proposal significantly expands the scope to now include cutaway buses. This expansion was never previously discussed, and it is unclear that there is a commercially available cutaway bus to meet this requirement. On page six of the ICT Proposal, there is a statement that affirms that while some of these vehicles are in use today, none have been Altoona-tested and are not eligible for federal funding. Furthermore, often these buses are used to fulfill critical American with Disabilities Act (ADA) paratransit services. If transit agencies are not able to find buses to meet the ICT Proposal purchase requirement, this may not only lead to impacts to paratransit service, but could impact a transit agency's compliance with ADA.

4. The timeline for implementation does not allow for sufficient opportunities to assess the technology availability or economic implications prior to enforcement.

The timeline for the ICT Proposal only includes one opportunity for an economic and technological assessment of the regulation's provisions in 2022, which occurs after the first requirement is mandated. Under OCTA's existing procurement process, OCTA will potentially be looking at replacing 58 percent of its fleet by 2023. Currently, it is unclear whether the timing will require either 25 percent or 50 percent of the purchase to be ZEBs, pending regulatory interpretation. This procurement will begin before the 2022 assessment. Pending the assessment by ARB in 2022, these procurement requirements may be deferred or changed based on the findings. However, OCTA will still be required

to abide by the purchase requirement even if the findings by the ARB demonstrate that the technology is not viable in larger operation, or it is not economically viable. The ICT proposal should ensure that technology and economic assessments are done before any requirement is enforced, including prior to 2020. In addition, if at any time a requirement is found to be technologically or economically infeasible, a grace period should be applied for all transit agencies, including agencies undergoing previous procurements.

5. The ICT Proposal fails to account for each transit agency's unique procurement process, potentially impacting certain transit agencies more than others.

As stated above, OCTA's procurement process is unique in that, unlike in the hypothetical scenario presented on page 12 of the ICT Proposal, OCTA does not procure vehicles every three years, and its procurements are for much larger portions of its fleet. Acknowledging that not every transit agency's procurement process is the same, or useful life requirements, the ICT Proposal should include flexibility to address each agency's process. This includes cost assessments, technology capabilities, bus availability and manufacturer warranty standards.

6. Early action credits should be granted in a manner that takes into account all transit agency actions taken prior to any new requirement taking effect.

OCTA supports ARB efforts to recognize those agencies that have taken steps to implement advanced technologies prior to any new regulatory requirements. Currently, the ICT Proposal provides for different credit levels depending on whether the bus was put into service before or after January 1, 2018 for hydrogen buses. It is unclear why that differentiation is made. Instead, the two credits should be awarded for all hydrogen buses procured prior to the regulation taking effect. In addition, credit should be awarded for all battery electric buses procured prior to the regulation taking effect, rather than no credit being awarded for buses put in service after December 31, 2017.

7. The proposed conditions that would allow for temporary delay fail to take into account situations where service cuts may result or the technology fails to meet its stated capabilities

OCTA appreciates efforts to include scenarios where the ARB Executive Director may approve extensions for compliance with the requirements when certain conditions are present. While each of the scenarios presented are valid, this type of extension should also be granted in other situations, including (but not limited to) situations where:

- additional new funding is not identified to cover the increased costs associated with this regulation
- transit funding is reduced or cut by the state or federal government
- the new technology is unable to comply with state or federal requirements and/or does not pass the new Altoona testing requirements
- the costs of complying with the regulation would result in a reduction in transit service

- the buses are unable to meet a transit agency's range or useful life requirements
8. The ACT Proposal must consider infrastructure transition and facility requirements that will be required for a technology transition.

ARB's ICT Proposal will require a complete re-assessment of current operating infrastructure to include a revamp of the existing power grid for battery powered buses, sources of hydrogen for fuel-cell buses, electrical charging outlets throughout the facilities, high voltage connectors, individual controllers intended to monitor energy dispensed on as a per bus basis, among other updates. This will all require expanded right of way at the transit bases, which may not be available. This will also necessitate additional funding investment, which is not contemplated in the current ICT Proposal. As an example, currently, one of the largest OCTA facilities has a peak electricity consumption for a 200-bus operation in the range of ~1.6 MWhr. Based on today's requirement for charging battery-powered buses, this amount of energy is only capable of charging about 26 electric buses. In order to support 200 electric buses, this capacity needs to be multiplied by about eight times.

Within each base, the infrastructure will also need to be updated. Existing fueling practice includes a location for fuel dispensing, with each bus only requiring five to seven minutes for fueling. Fueling for ZEBs would entail multiple sources/locations for vehicle tracking, fuel dispensing, recording of consumables, etc. Additionally, plug-in battery powered buses are required to be "plugged-in" for several hours which extends fueling time and requires facility capacity. For each fueling station, installation of electrical conduits, electric plugs, individual charging and monitoring stations will also be required. These updates should be covered in the ICT Proposal.

9. Personnel training will be required for any technology transition, which is not currently addressed in the ICT Proposal.

Traditionally, the work-force found in the transit industry includes a high degree of expertise with diesel engines, with transition now occurring because of the introduction of natural gas engines. With high demand for this knowledge in fields outside of transit, there are also numerous existing issues in attracting talent to fill maintenance and operations roles. ARB's ICT Proposal will create an added level of difficulty, by requiring a completely new type of staff knowledge, without any identified training opportunities.

A transition to ZEBs would require complete retraining on not only the technological operating elements of a bus, but also the safety aspects. Without any existing large operations of ZEBs at transit facilities, many of the implications of the technology change are unknown. Gradual implementation of the technology would allow transit agencies to mitigate these risks and prepare and protect their staff.

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January 22, 2018

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1001 I Street
Sacramento, CA 95814

SUBJECT: Proposed Innovative Clean Transit (ICT) Regulation

Dear Chair Nichols and Members of the California Air Resources Board:

The San Diego Metropolitan Transit System (MTS) appreciates the opportunity to comment on the proposed Innovative Clean Transit (ICT) Regulation. Our agency supports the State's efforts to pursue a comprehensive strategy to meet air quality standards and greenhouse gas and petroleum reduction targets as well as the goal to achieve zero emissions bus fleets in the future. However, we ask that the Board delay a decision on this proposed regulation and allow MTS and other transit agencies to continue to work with staff to propose a more effective urban bus strategy than the one included in the ICT Discussion Document.

The December 15, 2017 Discussion Document provides a synopsis of a regulation that would have significant negative impacts on urban bus service like ours. The approach, first presented to us in December 2017 as the proposed ICT regulation and now being offered for adoption possibly as soon as June 2018, would compel transit agencies with more than 100 vehicles to purchase zero-emission buses (ZEBs) upon their next procurement, beginning 2020. This "purchase mandate" would initially require that a quarter of new buses procured by these larger agencies be zero-emission, and would increase every three years until all buses procured by an agency, no matter its size, are zero-emission, beginning in 2029. CARB staff indicates intent to extend this purchase mandate to all transit buses, including cutaway style, smaller buses. Below are MTS' major concerns with the proposed regulation and the discussion document. As well, MTS supports the forthcoming communication from CTA that provides a more detailed discussion and analysis.

MTS staff is concerned that the ICT as currently written will have significant negative financial and operational impacts on transit agencies. The ICT could result in the unintended consequences of forcing reductions in transit service and/or fare increases, since the costs associated with implementing the regulation are underrepresented in the draft. For almost two years, transit agencies have been working on a cost analysis with CARB staff and the cost analysis and assumptions included in the ICT are not consistent with the outcome of those efforts. Specifically, the discussion document's ZEB costs are grossly understated and inconsistent with the analyses of the transit agency advisory group and CTA. Bus purchase prices, infrastructure costs, and electricity rates are all underestimated, and the projected possible maintenance savings are overstated and not sufficiently proven within current ZEB pilots. The differences in cost models are stark. While the discussion document infers that ZEB costs are somehow similar or less than conventional technologies, our transit agency CTA model projects an



increased cost to California transit systems of at least \$3 billion to achieve the proposed regulation by 2040.

In addition, while MTS appreciates that staff has previously indicated it would seek ways to help fund the purchase mandate, guarantees of funding are not in the proposal. Under the proposed ICT, State-provided bus purchase incentive funding and sources could not be used to meet base bus compliance purchase requirements, and there is no indication that Cap and Trade or settlement monies would be made available either. The result of this proposal leaves the entire burden for the major cost increases of meeting the regulation on the backs of transit systems – at a time when transit systems are already trying to balance decreasing ridership and corresponding funding losses.

The trade-offs to accommodate these enormous added costs to implement the ICT proposal would have the greatest impact on low income, minority and disabled communities. MTS's customer base is 71 percent transit dependent, and 80 percent low income and/or minority. A full two thirds of passengers live in households with annual incomes less than \$30,000. San Diego's disadvantaged communities rely on MTS to get to jobs, medical appointments, religious services and school. Reduced service, delayed light rail expansion (using zero emission vehicles) and other cost offsets would have a compounded, quality of life impact on these populations.

Another major area of concern for MTS is the sudden inclusion of cutaway style / smaller size buses in the proposed regulation and purchase requirement. This aspect has not even been in the discussion until now. No analysis or evaluation of this aspect of the ICT has been completed, there is no industry track record for a ZEB product in this type of transit fleet, and no Altoona-tested vehicles are available on the market. Extended daily range capabilities on these buses are also required, frequently exceeding fixed route bus requirements. Paratransit buses provide critical service to our most vulnerable population. In light of these major concerns, unknowns and requirements, at the very least, we request that the Board consider removing the smaller buses from the regulation, or defer this for several years to allow the technology to catch up.

Lack of standardization of charging equipment, connections and on-board technology and controls continue to be significant roadblocks to ZEB deployment. Standardization and interoperability by all manufacturers should be included as a requirement in the regulation prior to enforcement of a purchase mandate. Interoperability is critical for agencies to be able to ensure that duplicative infrastructure is not required for operation of different fleets, and to allow transit agencies to competitively procure from all manufacturers. Competitive procurement is essential for driving improvements in this technology, and significantly, competitive procurement is required by local, state and federal regulations. The lack of standardization or interoperability, combined with the competitive procurement requirements, will almost guarantee that transit fleets will be required to increase fleet sizes beyond their current levels, further exacerbating the increased costs of ZEB ownership.

CARB staff recognizes that electricity rates are inconsistent throughout the state yet the ICT regulation does not include participation from the utilities as a requirement prior to the proposed regulatory implementation. For agencies like MTS the much higher electricity rates in Southern California further erode the rosy, misleading financial calculations incorporated in and relied upon for the proposed ICT. In addition, the ICT seems to assume that utilities will help fund the electrification infrastructure, yet this has not been indicated by SDG&E. We suspect that as with most infrastructure projects associated

with SDG&E, MTS will be required to shoulder much if not all of the cost -- infrastructure costs that are not appropriately considered in the discussion document. Contemplating full ZEB fleet deployments and the corresponding required infrastructure at existing transit operating facilities is a complicated, costly proposition. It raises major concerns about whether it is even feasible to equip some existing operating facilities with this much electricity. It also raises major concerns about how daily recharging of an entire fleet could be accomplished. In the discussion document, page 14, CARB staff states, "... concerns about space constraints for charging infrastructure in the depot may not be an issue for smaller or larger deployments because of overhead charging solutions that have minimal impact on congested yards". This approach is not in existence, and we believe that this is a gross generalization of this major, unanswered issue.

Finally, we request that the ICT further define what might be off ramps or provisions for delay of the purchase requirements. MTS and several other transit agencies are currently or soon to begin operating pilot ZEB programs. The objective information gleaned from these pilots should be used to determine if the purchase requirement should go into effect. For instance, delays could be triggered by the failure to achieve specific metrics for range, reliability, bus cost, electricity costs and interoperability. Specifying performance standards and then relying on real world experience rather than manufacturers' promises would make for a more effective transition to all-ZEB fleets. We also are interested in hydrogen fuel cell technology and we encourage CARB to continue to include this as a viable technology to continue to be explored and contemplated. It is also important to note that MTS continues to be an aggressive leader in reducing emissions:

- Our bus fleet uses renewable natural gas, we are committed to 100% low NOx engines, and we are committed to a propane powered paratransit and cutaway bus fleet.
- Our zero emissions light rail system carries over 40% of our total system ridership, and MTS is in the construction phase of a major expansion of our light rail system

MTS is committed to continuing to work with CARB staff to create an ICT regulation that will achieve the goals of improved air quality, reduced reliance on petroleum, and reduced greenhouse emissions. MTS wants an approach that will achieve these goals and transition us to ZEB's in the future, without the very real risk of reducing the level and quality of public transit currently provided to San Diego. If transit is significantly reduced to achieve the ICT, and auto VMT's increase as a result, the goals of the ICT and the advantages of public transit will not be realized. We ask that you reconsider the Discussion Draft in light of our comments and those of the CTA and our fellow transit systems and allow the appointed transit advisory team to work through these essential issues and avoid unintentional consequences like transit service reductions impacting our most vulnerable riders.

Respectfully Submitted,



Paul Jablonski
Chief Executive Officer

Cc Richard Corey, Executive Officer, California Air Resources Board
Jack Kitowski, Chief, Mobile Source Control Division, California Air Resources Board

Shirin Barfjani, Air Pollution Specialist, Mobile Source Control Division, California Air Resources Board
Yachun Chow, Manager, Zero Emission Bus Truck and Bus Section, California Air Resources Board



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February 13, 2018

Ms. Mary D. Nichols, Chair
California Air Resources Board
1001 I Street
Sacramento, CA 95814

RE: Proposed Innovative Clean Transit Regulations

Dear Chair Nichols and members of the Board:

On behalf of the San Mateo County Transit District (District) I am writing to comment on regulations recently unveiled by the California Air Resources Board (CARB) staff. The District operates SamTrans, San Mateo County's bus and paratransit service. The District strongly supports policies that will shift the California bus fleets to zero-emission buses (ZEBs). However, the policies currently being proposed are beyond what is reasonable for our agency and others to meet. We are writing in support of the letter submitted by the Metropolitan Transportation Commission (MTC) and to add our own comments.

The District is in the early stages of determining the feasibility of a fleet conversion. We have received grant funding for a pilot for 10 battery-electric buses and associated infrastructure. Though this is a major first step for our organization, with over 300 buses many of which are well within their useful life, a full conversion is a very long process that we hope to approach methodically.

The upfront cost of fleet conversion is extremely high. The buses themselves are more expensive than conventionally-powered vehicles. Additionally, installing electric charging infrastructure is a high cost up front capital investment and the cost of electricity as a fuel are unknown. The District, like most bus operators, serves a number of transit dependent populations and operates on very thin financial margins. Though we are working towards electric conversion, the timelines being proposed as mandates may not be financially feasible without significant external funding sources. Local agencies should be given the flexibility to convert on a timeline that works within their own budgetary constraints and does not force cuts to critical services that some of the State's most vulnerable populations are dependent on.

Though the technology on ZEBs has improved dramatically in recent years, any mandate should be based on existing technology and not on predictions of what may be viable in the future. Currently, several of our bus routes are longer than the distances that electric buses can run for on a single charge, and charging mid-route is logistically complex, has the potential to delay service, and would require additional equipment that is extremely costly. The District is also exploring implementing multiple long-distance express routes. Operating these with electric buses would require additional infrastructure to charge on either end of the route unless the technology improves dramatically. Though we hope the technology will one day allow for a feasible transition to all-electric bus operations it currently does not.

SAN MATEO COUNTY TRANSIT DISTRICT
1250 San Carlos Ave. – P.O. Box 3006
San Carlos, CA 94070-1306 (650)508-6200

We are also extremely concerned about the application of these regulations to cutaway buses, which are used for paratransit service. At this point there are few if any proven and FTA-approved zero-emission cutaway buses available on the market. As the operator of the San Mateo County Redi-Wheels program we believe it is imperative that there are proven vehicles in service prior to any consideration of regulating cutaways.

The District strongly supports exploration and implementation of electric vehicle fleets. However, we are concerned that these regulations may cause financial hardship for our and other agencies. The proposed timeline may not be financially feasible to implement. We ask that CARB work with the California Transit Association to develop a set of guidelines and funding sources to make the fleet conversion a reality.

Please feel free to contact Casey Fromson, Director of Government and Community Affairs, at (650) 508-6493 or via email at fromsonc@samtrans.com if you need any additional information.

Sincerely,



Jim Hartnett
General Manager/Chief Executive Officer

cc: San Mateo County Transit District Board of Directors
San Mateo County Transit District State Legislative Delegation



Regional Transit

Sacramento Regional
Transit District
A Public Transit Agency
and Equal Opportunity Employer

Administrative Offices
1400 29th Street
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1225 R Street
Sacramento, CA 95811

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916-321-BUSS (2877)
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sacrt.com

Public Transit Since 1973

January 30, 2018

California Air Resources Board, Members
1011 I Street
Sacramento, California 95814

RE: Concerns Proposed Innovative Clean Transit Regulation

On behalf of the Sacramento Regional Transit District (SacRT), I write to provide comments and express our profound concerns with the milestone timeframes the California Air Resources Board (CARB) board has outlined in the Draft Innovative Clean Transit Regulation Discussion Document published on December 15, 2017.

SacRT supports CARB efforts to achieve zero-emissions transit fleets and believes investment in zero-emission buses (ZEBs) will enhance the Capital region's connections to public transit and advance achievements in delivering real improvements towards the state's clean energy and transportation goals. Yet, the draft investment timeframe is significantly aggressive and would add to SacRT fiscal mandates without sufficient funding to meet the mandated timeframe CARB aspires to establish.

The majority of public transit agencies in California operate under limited resources. Currently, SacRT is fiscally restrained due to our limited local dedicated transit funding and the proposed CARB timeframe would also add operational constraints without the ability to leverage competitive funding. Providing enhanced regional mobility is SacRT's mission and to make sure SacRT and transit agencies in California have the appropriate heavy-duty electric bus charging infrastructure in place we respectfully request consideration of a more flexible timeframe that would support the electrification of public transit.

In addition to the funding constraints that are challenging to overcome, an operational impact and barrier to implementation would be the ability to procure and manufacture the necessary proposed percentage of electric bus vehicles for all transit agencies in the State in the same timeframe.

SacRT looks forward to the transformational opportunities in zero emissions and has supported zero-emission vehicle (ZEV) investment with Sacramento as a designation first Green City. Along with our region's collaborative partners is ready to help implement the use of ZEV technology innovations. The Sacramento region is an exemplary location to demonstrate the successful implementation of both ZEV and ZEB. SacRT current all CNG bus fleet connects regional light rail, transit, Amtrak routes in addition to future Streetcar and high speed rail.

We stress that the draft regulation timeframes should allow more time for California's transit agencies to successfully create the foundation necessary to support innovative clean transit technologies and assist in efforts in this transformational change.

Thank you for your thoughtful consideration. Should you have any questions, please contact me at (916) 556-0441 or by email at HLi@sacrt.com.

Sincerely,

Henry Li
General Manager/CEO

*Santa Cruz Metropolitan
Transit District*



January 19, 2018

California Air Resources Board Members
1001 I Street
Sacramento, CA 95814

Dear Chair Nichols and Members of the California Air Resources Board:

Santa Cruz Metropolitan Transit District (METRO) is responding with comments to the Draft Innovative Clean Transit Regulation Discussion Document (ICT) published December 15, 2017.

In general, and subject to the comments contained in this letter, METRO is supportive of CARB's goal to achieve zero-emissions transit fleets. In fact, as identified on page 5 of the ICT, METRO's Board adopted a resolution in May 2017 setting a goal to achieve a Zero Emissions Bus (ZEB) fleet by 2040. **However**, we should be clear that the METRO Board has adopted this as a **goal** and **not a mandate**.

As discussed in this letter, achieving METRO's ZEB goal is subject to resolution of a number of challenges in the years to come. Those challenges include areas of funding, technology, horsepower, axle-weight, and battery density innovation, just to name a few. **These challenges are significant** and cannot be overcome today. In contrast, the ICT establishes prescriptive milestones that must be met in order to achieve mandatory 100% ZEB purchases by 2029 and with only four qualifying scenarios in which "temporary delays" can be considered. On page 14 of the ICT, CARB staff goes on to say "At this time we do not believe off-ramp provisions are needed..." METRO believes that CARB staff is mistaken in their perception of the current state of ZEB evolution. METRO's response today will shed some light on our concerns in this respect.

METRO Comments about the ICT

Fleet Size and Paratransit

- a. As currently drafted, it may be difficult for a transit agency to determine their fleet size.
 - i. Are cutaway buses that are used for paratransit service and weigh more than 14,000 pounds considered heavy duty vehicles for the purposes of determining fleet size?
 - ii. Are buses used temporarily in demonstration or pilot projects included in the fleet size?
 - iii. If an agency leases buses, regardless of the lease duration, are those buses included in the fleet size?

- b. METRO requests that cutaways used for **paratransit vehicles be excluded from the zero emission regulation** and not counted towards fleet size due to the unknown availability, lack of field testing and the unknown performance of such electric vehicles for ADA paratransit service. As the paratransit community is heavily reliant on this service, and the most vulnerable population, ZEB's in paratransit must be proven before implementing. Consider the following complications:
- i. Opportunity charging (mid-day or in-route recharging) is not an efficient way to run paratransit service: Lifts and ramps needed to board mobility devices use battery power which is needed for propulsion, thereby limiting the vehicle range between recharges. METRO does not wish to build an ADA paratransit operating model that requires mid-day recharging. Such mid-day recharging will result in higher electricity cost (peak-hour recharging); a need to purchase more vehicles; and a need to add additional driver personnel.
 - ii. Expected range limitations: Paratransit cutaways are much smaller than fixed-route buses and therefore have physical limitations on how many batteries they will hold. Increasing the number of batteries (battery volume) on paratransit vehicles to eliminate in-service recharging is not a viable solution with today's technological limitations. Greater battery volume will also diminish the passenger capacity of the vehicle and require more vehicles to carry the same number of passengers. **ADA paratransit vehicles should be excluded from the Regulation until such time as battery density technology improves significantly.**
 - iii. METRO has had to use paratransit vehicles for formally declared emergency evacuations due to topographical constraints in rural areas. Disruption of power in these situations could limit METRO's ability to adequately respond.
 - iv. METRO is aware of only one zero emissions paratransit vehicle manufacturer. The market is simply not sufficiently developed to provide suitable vehicles and a variety of models which will meet the range of differing paratransit operating parameters across the state.

Infrastructure Assistance

- a. CARB must work collaboratively with the PUC to establish mandatory and streamlined processes with electric utilities to mitigate the high cost of yard recharging facilities.
- b. Currently, utility companies impose minimum electricity usage to recapture the capital cost of new transformers and they are not inclined to provide larger transformers up front for fleets that are phasing-in ZEBs over time. Instead, they will require the transit agency to upgrade transformers multiple times throughout the phase-in of ZEBs.
- c. The Regulation is silent on the costs associated with **opportunity recharging (in-route recharging)**. Transit agencies may have to fund additional significant capital costs for in-route recharging equipment and facilities, and it may be difficult to locate such facilities within the public right-of-way.

Potential Funding and Incentive Opportunities

CARB staff lists a number of funding sources that they view will enable transit agencies to purchase ZEBs at nearly the cost of a non-ZEB vehicle. The discussion on funding is misleading.

- a. A vast majority of funding sources cited in Potential Funding and Incentive Opportunities are **competitive grant programs** which do not offer any funding certainty or predictability for an agency to use in their ZEB funding analysis, yet the ICT is prescriptive, date-certain and structured without a funding “*off-ramp*.”
- b. Smaller agencies are at a disadvantage in competitive programs because a large transit agency in a dense urban area typically scores higher on a cost/benefit basis because the emission reductions are greater, especially if they are located in a federal air quality non-attainment district. In contrast, Santa Cruz METRO is located in a federal attainment district. Therefore, **a proposed Regulation should provide additional time to phase-in ZEBs when the transit agency is located in a federal attainment district.**
- c. The Volkswagen Environmental Mitigation Trust Fund should be used to support deployment of zero-emission buses. This fund can help stabilize funding to achieve our collective goal.
- d. CARB itself does not provide any unique **formula funding** to help offset the incremental additional cost of ZEBs.
- e. The Potential Funding section does not include funding assumptions for certain infrastructure costs. Electric infrastructure costs are not limited to the yard recharger, as implied on page 9 of the ICT, Table 4. Electric infrastructure cost assumptions must include all capital costs associated with taking the power from the pole through a transformer, switching and distribution networks throughout the bus yard. At times when these concerns have been raised, CARB staff have dismissed them citing the ongoing SB 350 Transportation Electrification proceedings at PUC. Let us be clear: the funding for infrastructure that PUC is considering has not yet been approved, and the funding is not specific to public transit electrification.
- f. Page 14 of the ICT states “...*concerns about space constraints for charging infrastructure in the depot may not be an issue for smaller or larger deployments because of overhead charging solutions that have minimal impact on congested yards.*” This statement is in gross error as it relates to METRO. Regardless of choosing underground or overhead approaches, an electrical distribution network being added to METRO’s bus yard will be both complicated and expensive and there is no simple and inexpensive overhead solution, as implied in the ICT.
- g. The ICT does not include any assumptions for the capital costs associated with in-route recharging facilities (Opportunity recharging).
- h. Cap and Trade sourced funding comes with requirements that there be minimum expenditures in Disadvantaged Communities (DAC). Some communities do not have DACs and others, like Santa Cruz County, may have only one DAC. **The ICT should**

not include any additional mandates related to DACs and CARB should work with the legislature to develop legislation that will provide much needed relief from Cap and Trade DAC requirements.

- i. HVIP early emissions benefit: See ICT page 12, second bullet - The phasing out of HVIP qualification when a transit agency purchases the number of ZEBs required in a particular milestone year as opposed to “early” is unreasonable. **HVIP funding must be available at all times** for agencies purchasing ZEBs, irrespective of the purchases being made ahead of mandated milestones or on-time.
- j. Today, HVIP funding is only accessible if there is funding available at the time the ZEB order is placed, and the ZEB manufacturer must apply for the HVIP money. CARB needs to appreciate that well in advance of placing a ZEB order, a transit agency will have struggled mightily to identify the dollars with which to fund the ZEB order, especially small transit agencies such as METRO. **The HVIP program must change.** A transit agency needs to be **guaranteed** the HVIP dollars when cobbling together the capital funding for the ZEB order. To that end, CARB needs to modify the program such that an agency can obtain a **firm commitment** for the HVIP dollars in advance of placing the ZEB order. This **simple change** will significantly enhance a small transit agency’s ability to identify the funding resources for their ZEB purchase.

The 2029 mandate is far too aggressive given the current state of ZEB technology.

- a. Contrary to information contained in the ICT, battery capacity (energy density) industry-wide has not advanced much beyond 200 miles except in test track controlled conditions and what appears to be limited to one manufacturer. As discussed earlier, METRO does not wish for its ZEB operating model to include opportunity recharging. Instead, METRO’s operating model seeks to run ZEBs all day on an overnight charge. With numerous routes that exceed 200 miles/day, ranging up to 282 miles/day, and based on current ZEB non-test track range, METRO may not be able to run ZEBs purchased today on all routes. METRO believes that the stated or manufacturer marketed ZEB vehicle range is potentially far higher than the actual vehicle range. This is due to a number of obvious factors that impact how rapidly the battery power is drawn-down. **This is a significant problem.** When all buses in the fleet cannot run on all routes, the result is a dedicated fleet. Dedicated fleets are difficult to manage and to make morning rollout, especially in space-constrained yards such as the one METRO operates. **Dedicated fleets are not cost efficient or operationally effective.**
- b. METRO operates buses on Highway 17 from Santa Cruz to San Jose. Based on METRO’s recent experience, the current ZEB over-the-road buses or commuter bus ZEB technology is underdeveloped. Therefore, ZEB replacements on commuter bus routes would likely not be a 1:1 replacement. METRO’s best modeling indicates that three commuter ZEBs will be required to perform the work of two conventional CNG buses on its Highway 17 Commuter Express service due to the incline of the roadway and traffic conditions. The BYD over-the-road ZEB prototype recently tested by METRO performed poorly and could not provide enough horsepower to keep up with traffic,

topping out at 30 – 35 mph on some stretches of the highway. Any ICT Regulation crafted should **specifically exclude from the ZEB mandate commuter bus services** operating on mountain roads such as Highway 17.

- c. The ICT must be inseparably linked with a **PUC Regulation requiring that public transit agencies operating ZEBs receive a much lower electricity rate** from the utilities. With the current rate structure and infrastructure costs, propulsion costs may be much higher than the equivalent Compressed Natural Gas costs, especially if opportunity recharging is required. Such will likely negate the operating cost savings projected in Table 4 on page 9 of the ICT.
- d. Contrary to assertions made in the ICT, there is no evidence that ZEB prices are falling as the technology advances and demand increases.
- e. CARB staff states on page 4 of the ICT that “*nearly 1,000 transit buses are purchased in California annually.*” CARB staff includes in the assumption three ZEBs for Santa Cruz METRO. At this time, METRO has not placed an order for three ZEBs due to the challenges noted in ‘b’ above.
- f. Using the numbers contained on page 5 of the ICT, and extrapolating the bus assumptions, California alone will need to purchase 13,600 ZEBs to become a state with 100% ZEB fleets. Assuming that it will take through 2040 to fully retire non-ZEBs, this will equate to approximately 618 ZEBs/year. Surely CARB is aware that one particular major ZEB manufacturer has been struggling to fulfill its current contract commitments and transit agencies across America are reporting delayed deliveries from all ZEB manufacturers. **The ZEB manufacturers are not yet ready for an aggressive ZEB mandate.**
- g. California transit agencies are not the only transit agencies in America purchasing ZEBs.
- h. **Battery degradation** and the consequent decline in full-charge capacity are currently unknown. Neither of the two major ZEB manufacturers’ have provided anything more than battery degradation **estimates** and both are struggling with how to measure battery degradation. Some manufacturers claim 80% remaining capacity at twelve years, but no California agency has operated a ZEB for twelve years. Some manufacturers are guaranteeing the batteries for twelve years and others are not. Also, under the new federal Transit Asset Management program, the life expectancy of buses should now be upgraded to fourteen years.
- i. Batteries constitute one-fourth to one-third of a ZEB’s cost, which is not included in the lifecycle cost comparison in Table 4 on page 9 of the ICT. How many batteries will need to be replaced over the fourteen year life of the ZEB? What is the environmental impact of disposing these batteries?
- j. A ZEB purchased to run on a 200 miles/day route will not be able to run all-day without recharging when the batteries degrade to 80%. How soon will the batteries degrade to 80%? No one knows the answer today. There has not been sufficient ZEB experience with which to answer this question, and to make matters more complicated, different ZEB manufacturers are each using different battery technology. Further, if the answer is to replace the batteries when they degrade to a certain percentage, where will that money

come from and why aren't such costs incorporated into the ICT ZEB lifecycle cost analysis?

- k. Current longer range ZEBs, like the Proterra E2, may be able to cover all METRO routes today, however, the E2 appears to not meet the California axle-weight restrictions, as set forth in AB 1250 (ZEBs – 25K lbs. down to 22K lbs. by 2022). Proterra's website shows the curb weight of the E2 as 29,849 – 33,061 lbs. **No ICT Regulation should be implemented until such time as the ZEB manufacturers can certify all of their ZEBs as AB 1250 compliant.**

This letter raises serious and substantial concerns about the Innovative Clean Transit Regulation. It appears that in crafting this draft Regulation, CARB staff has not fully considered a host of concerns generated by transit agencies earlier with the Advanced Clean Transit Regulation. ZEB technology has not yet matured to a point where it is practical to implement an aggressive ZEB purchase mandate. Furthermore, CARB staff's schedule for adopting the ICT does not provide adequate time for transit agencies to respond. Comments communicated by METRO to CARB via this letter are representative of only a small number of concerns METRO has identified with the ZEB mandate.

METRO recommends that the ICT Regulation be placed on hold and a new review date be established, and that CARB work with transit agencies across California to debate and discuss the many ZEB challenges. METRO believes that transit agencies working collaboratively with CARB on the timing and composition of a ZEB mandate to identify a better approach than the one identified in the current proposed ICT Regulation will benefit all.

Sincerely,



Alex Clifford
CEO/General Manager

cc: Richard Corey, Executive Officer, California Air Resources Board
Steve Cliff, Deputy Executive Officer, California Air Resources Board
Jack Kitowski, Chief, Mobile Source Control Division, California Air Resources Board
Shirin Barfjani, Air Pollution Specialist, Mobile Source Control Division, California Air Resources Board
Yachun Chow, Manager, Zero Emission Bus Truck and Bus Section, California Air Resources Board
Jennifer Lee, Mobile Source Control Division, California Air Resources Board Member, Executive Committee, California Transit Association
Members, Zero Emission Bus Task Force, California Transit Association



TRANSIT DISTRICT MEMBERS:

*City of Carmel-by-the Sea • City of Del Rey Oaks • City of Gonzales • City of Greenfield
City of King • City of Marina • City of Monterey • City of Pacific Grove • City of Salinas
City of Sand City • City of Seaside • City of Soledad • County of Monterey*

February 15, 2018

TO: California State Delegation

State Senator Bill Monning
State Senator Anthony Canella
Assembly Member Mark Stone
Assembly Member Anna Caballero

RE: ARB Innovative Clean Transit (ICT) Regulation

Honorable California State Delegation,

Monterey-Salinas Transit District (MST) is a small public transit operator providing transit and mobility services to the residents and visitors throughout the Monterey Bay region including communities, employment centers, medical facilities, educational institutions and military installations in the counties of Monterey, San Luis Obispo, Santa Cruz and Santa Clara.

We learned today that the Union of Concerned Scientists and the IBEW are circulating a letter to legislators for their signature urging the California Resources Board to immediately adopt regulations regarding the procurement of zero emission buses (ZEBs) through a series of steps that would ultimately lead to all buses in California be zero-emission by 2040. MST respectfully **requests your office abstain from signing on to this letter at this time** for the following reasons.

MST has **significant** concerns with the California Air Resources Board regulatory approach to electrifying California's public transit bus fleet. This approach, first presented to us in December 2017 as the proposed Innovative Clean Transit (ICT)

Advocating and delivering quality public transportation as a leader within our community and industry.

Transit District Members Monterey County • Carmel-by-the-Sea • Del Rey Oaks • Gonzales • Greenfield • King City • Marina • Monterey
Pacific Grove • Salinas • Sand City • Seaside • Soledad **Administrative Offices** 19 Upper Ragsdale Drive, Suite 200 Monterey, CA 93940

PH 1-888-MST-BUS1 (1-888-678-2871) • FAX (831) 899-3954 • WEB mst.org

regulation and now being offered for adoption in June 2018, would compel MST and all other transit agencies with more than 100 vehicles to purchase zero-emission buses (ZEBs) upon their next procurement, beginning 2020. This "purchase mandate" would initially require that a quarter of new buses procured by these larger agencies be zero-emission, and would increase every three years until all buses procured by an agency, no matter its size, are zero-emission, beginning 2029. We know the proposed ICT regulation, like the proposed Advanced Clean Transit (ACT) regulation that preceded it, will be costly, yet it is being promoted by ARB staff without a validated account of its total costs to the state or to individual transit agencies, and without regard to the various funding and/or operational constraints these agencies face.

MST does not oppose the ARB's desire to regulate the reduction of GHG emissions in order to improve the health and quality of life in our state. As a matter of fact, our governing board, consisting of all of the jurisdictions comprising the county of Monterey, has adopted a goal that directs its staff to "promote policies and practices that encourage environmental sustainability and resource conservation and implement economically sound and environmentally-friendly resource conservation policies that reduce dependence on scarce natural resources and the potential for negative impacts on our environment." As a result, MST has a history spanning several decades of testing and implementing award winning emission reduction programs in pursuit of this goal. In recent years we have been experimenting with electric zero emission buses by being the first transit operator in the state to demonstrate the ability to charge an electric bus en route - wirelessly, through the air - using inductive charging technology, and we have two new ZEBs on order which will be operating later this summer within disadvantaged communities of the city of Salinas. To date, our experience and operating data have shown that the current state of ZEB technology is not as reliable, or cost effective as some would lead the public to believe and that the infrastructure required to power a fleet of over 100 buses is prohibitively expensive impacting our ability to maintain existing levels of service to the communities we serve. From our experience to date we can reasonably predict that the proposed CARB regulation as currently written are unachievable in the near term and would likely have the unintended consequence of reducing transit services to those members of the community who depend upon it.

MST is working with our peers transit operators around the state and partners in the bus manufacturing industry through the California Transit Association, in developing a series of recommendations to ARB that we believe could result, pending acceptance by ARB, in a workable framework to support widespread transit electrification. I want to be absolutely clear that MST and the California Transit Association are **NOT** trying to stop ARB from regulating. We are simply trying to work with ARB to develop a regulation that will be successful, achievable and limit knowable and unforeseen impacts to transit operations.

The California Transit Association is continuing to emphasize in meetings with ARB and the Legislature, the need for flexibility, dedicated funding to address upfront capital costs (buses and charging infrastructure) and relief from high electricity rates. We

believe that good governance dictates that for the state and local public transit operators to be successful partners; and to avoid predictable impacts, such as cuts to transit service, as well as currently unknowable impacts to transit operations, any shift to ZEB technology must be done:

- **Methodically**, with full consideration of, and clear solutions to, barriers outside the control of transit agencies (e.g. the high upfront capital costs of zero-emission buses and charging infrastructure, the excessive costs of electricity relative to conventional fuels, and the untallied costs of retraining maintenance workers and bus operators);
- **Iteratively**, evaluating cost and operational data as it is collected from real-world ZEB deployments as well as changing funding landscapes, and allowing for adjustments to long-term targets based on budgetary, operational and technology feasibility; and,
- **In a Manner That Retains Local Decision-Making** to allow the public servants who manage and operate our transit agencies to make operational investments and procurement decisions that avoid the operational impacts that could result from an overly-prescriptive and forced transition to ZEB technology.

Signing the letter that is currently being circulated suggests that ARB should move forward with its current approach. However, it would be better if the negotiation process were allowed to work; therefore, **MST respectfully requests your office abstain from signing on to this letter at this time.**

Sincerely,



Carl G. Sedoryk
General Manager/CEO

C: Josh Shaw, Michael Pimentel -- California Transit Association



February 16, 2018

Yachun Chow, Ph.D.
Manager, Zero Emission Truck & Bus
Mobile Source Control Division
Air Resources Board
1001 "I" Street
Sacramento, CA 95814

RE: Innovative Clean Transit Proposal Comments

Dear Dr. ^{Yachun}Chow,

I want to again thank you and your colleague, Shirin Barfjani, for taking the time to meet with me and nine other rural and small urban Northern California transit operators in Marysville on Monday, February 5th to discuss the Innovative Clean Transit (ICT) proposal. I very much appreciate the opportunity to meet with you on this landmark initiative. As promised, my specific comments and suggestions are provided below for your consideration.

1. One Size Does Not Fit All – Especially in California:

Like other rural and small urban transit operators, Yuba-Sutter Transit does has neither the financial capacity or technical expertise to effectively implement the proposed regulation on the proposed schedule and would benefit greatly from allowing the larger operators to proceed with a more substantial head start so that the smaller operators can glean from their experience.

For this reason, I would suggest that all small operators (under 100 buses) be placed in the 100 percent group with an effective date of 2029. It will be easier and much more cost effective to convert in one step with the benefit of more information and time available to leverage expected ZEB technology and reliability improvements than it will be to piecemeal the conversion (which for Yuba-Sutter Transit would begin in 2023) with substantially less information and time. The financial incentives for early adoption will be even more meaningful and realistic as well during this interim period.

2. Facility Readiness is Largely Unknown for Rural & Small Urban Operators

Rural and small urban transit fleets are often housed either in partnership with a local jurisdiction's corporation yard or in small facilities that have been leased and/or renovated for transit use. Few have purpose-built facilities that were designed and constructed specifically for transit operations and fewer still have available land or capacity to quickly expand their facility's footprint to accommodate additional functions or operating limitations that are likely to result from a change in how vehicles are fueled and parked.

The feasibility/cost to retrofit, expand or possibly replace existing rural and small urban transit facilities is potentially significant and largely unknown. Yuba-Sutter Transit has received an estimate of \$75,000 - \$85,000 from a qualified consultant just to evaluate the feasibility and/or cost of converting our existing facility to allow for the operation of zero emission buses. Until the feasibility and cost of making the necessary improvements to our facility is known, we cannot even start to establish a scope of work and secure the necessary funding to retrofit or replace our facility.

Even more important, once a specific direction is known, it is likely to take at least five years (much longer if property acquisition and new construction is required) to finance and substantially retrofit or replace an existing transit facility assuming that funding and environmental hurdles are easily satisfied.

For this reason, in addition to the above suggestion for a 100 percent compliance date of 2029 for small operators, I would also suggest the establishment of a specific funding source to assist transit operators in the assessment of their existing facilities to inform decisions regarding the conversion or replacement of those facilities for ZEB operation. I am not aware of any GHG or ZEB related funding sources that can be used for planning purposes.

3. Drop Cutaway Buses from this Regulation or Establish a Completely Different Track

There is a huge difference between a cutaway bus (typically between 14,000 and 20,000 GVWR) with a useful life of 7 to 10 years costing \$75,000 to \$125,000 and a heavy duty transit bus (typically over 20,000 GVWR) with a useful life of 12 to 15 years costing \$400,000 and up. Besides the fact that there is no commercially available ZEB alternative for these smaller buses that are typically used for paratransit and rural transit service, the relative life cycle cost of converting these vehicles to zero emission vehicles is dramatically different. In addition, these small vehicles are typically operated in low-productivity services (paratransit and rural/small urban routes) resulting in relatively little benefit in terms of GHG emission reductions further reducing the cost/benefit ratio of including these buses in this regulation.

For this reason, I would suggest that cutaway transit vehicles under a certain weight be dropped entirely from the proposed ICT regulation. Alternatively, lighter weight vehicles could be placed on a completely separate track that recognizes the current lack of a commercially available ZEB vehicle in this weight class because immediately including them in the proposed implementation schedule will significantly affect our compliance planning process.

4. Commit to an Early & Often Review Cycle – Not a “Set it and Forget It” Regulation

The proposed 2022 informational update is completely inadequate given the potential impact of the proposed regulation on the cost and availability of public transportation especially in the rural and small urban areas of California. Despite enormous gains in this area, ZEB technology is still evolving so regular reviews are important to assess the practical impact and limitations that may exist or become known over an implementation period of the 10 plus years and to make mid-course corrections or adjustments as necessary.

For this reason, I strongly suggest that CARB commit to an annual review of this regulation beginning in 2019 at least through 2029. These regular reviews and updates will assure public transit operators that the ARB will remain an active and informed partner throughout this process.

Thanks again for the opportunity to provide input into this important initiative and please feel free to contact me if you have any questions regarding these comments.

Sincerely,



Keith Martin
Transit Manager

CC: Senator Jim Nielsen, District 4
Assemblyman James Gallagher, District 3
Chairman Manny Cardoza, Yuba-Sutter Transit Board of Directors
Jacklyn Montgomery, CalACT
Joshua Shaw, California Transit Association
Shirin Barfjani, CARB



December 26, 2017

Mary D. Nicols, Chair
Attn: Shirin Barjani
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Dear Ms. Nicols:

The Napa Valley Transportation Authority (NVTA) appreciates the opportunity to comment on the Innovative Clean Transit (ICT) Regulation Discussion Document. NVTA is a joint powers authority comprised of the cities of American Canyon, Napa, St. Helena, Calistoga, the Town of Yountville, and County of Napa serving as the congestion management agency and operator the Vine public transit system in the Napa Valley. NVTA supports the California Air Resource Board's efforts to pursue innovative strategies to meet the State's greenhouse gas (GHG) reduction targets and improve air quality.

While NVTA fully understands the importance of reducing harmful emissions, the agency is also familiar with some of the pitfalls associated with procuring and deploying new, unproven technologies. In 2009 NVTA purchased eight (8) New Flyer gas electric hybrid buses for its fixed route system. Shortly after delivery, the manufacturer of the drivetrain went bankrupt and the performance and reliability of these vehicles was a miserable failure forcing NVTA to spend hundreds of thousands of dollars to keep the vehicles running – dollars that could have been better spent on expanding transit service. This experience has made NVTA more cautious pursuing new vehicle technologies .

Nevertheless, NVTA continues to acquire clean technology vehicles both because the organization is anxious to green its fleet, but also because the communities where the Vine operates embrace the agency's efforts to reduce emissions. In that vein, NVTA pursued and was awarded Federal Transit Administration (FTA) Low and No Emission 5339c Grant Program funds to purchase five (5) Zero Emission Battery (ZEB) electric buses. The buses will be deployed into shuttle service in the smaller jurisdictions within Napa County. NVTA has partnered with the Center for Technology and the Environment (CTE) to determine the best way to integrate and deploy the vehicles so as not to disrupt current service levels. CTE further has helped with mitigating risk so that some of challenges that occurred with the gasoline-electric hybrid vehicles can be avoided. While this model of procuring and deploying ZEBs has helped immensely navigating towards a cleaner fleet, it is costly and limits the services that NVTA can deploy to serve the many diverse communities in the Napa Valley.

Cost and Funding Concerns:

The Innovative Clean Transit Regulation proposal requires NVTA to begin purchasing ZEB at a rate of 50% of bus procurements beginning in 2023. In 2026, 75% of NVTAs procurements would need to be ZEBS and this would increase to 100% of all procurements in 2029. Based on NVTA's current fleet size and replacement cycle, the regulation would result in the purchase of ninety-five (95) ZEBs through 2040.

NVTA's main concern is funding. Based on the Vine's existing replacement schedule and the current cost differential of Battery Electric Buses compared to standard diesel buses, the projected cost to NVTA would be an additional \$21.4 million through 2040. That is more than twice the agency's current annual budget (both operating and capital combined). Additionally, NVTA would need to spend approximately \$4.8 million on chargers and other EV enhancements over the same time period.

Further, under the proposed ICT Regulation, HVIP funding would not be an eligible fund source for buses mandated under the regulation. The only way that NVTA would be able to meet the currently proposed ZEB procurement schedule is if CARB relaxed ZEB bus eligibility rules for all the grant funding that it currently administers – at least until ZEBs, (inclusive of factoring the cost of building new compatible infrastructure cost) are on par with traditional transit vehicles.

Safety and Federal Regulations:

NVTA also has a concern about the class of vehicles covered by the proposed ICT Regulations. By setting the lower limit of GVWR at 14,000 lbs. the regulation will encompass paratransit vehicles. Currently, there are no Altoona tested zero emission paratransit vehicles for sale. NVTA cannot risk carrying its most vulnerable riders in vehicles that have not been adequately tested. Many of NVTA's Vine Go paratransit riders have compromised health, and given the inclement and frequently extreme weather that the vehicles operate, the agency risks compromising the wellbeing and potentially, the lives of its riders should a vehicle breakdown.

Additionally, NVTA uses federal funds to acquire and maintain its fleet – so not only are untested vehicles a serious safety concern, the agency would be in violation of federal regulation to introduce non-tested vehicles in its fleet. NVTA recommends deferring this element of the proposed ICT Regulation until such time there is a proven technology introduced in the marketplace.

Once again, NVTA appreciates this opportunity to comment on the proposed ICT Regulation. The agency is committed to working with CARB staff to create an Innovative Clean Transit Regulation that will achieve reduced GHGs and other harmful emissions, but also ensures adequate safety for riders and minimal financial risks to the agency.

Please contact me at kmillers@nvta.ca.gov or 707-259-8634 or NVTA Policy Analyst, Justin Paniagua (jpaniagua@nvta.ca.gov or 707-259-8781) should you have any questions or require additional information.

Sincerely,



Kate Miller
Executive Director, NVTA

San Luis Obispo Regional Transit Authority

Dear Ms. Barfjani –

I am writing to you to express my concerns about the proposed new Innovative Clean Transit Regulation, and its potential operational and financial impact on the San Luis Obispo Regional Transit Authority (RTA). The RTA is the regional public transportation operator that connects cities within San Luis Obispo County, as well as regular service to Santa Maria in northern Santa Barbara County. We primarily operate fixed route buses along the SR1 corridor between San Luis Obispo and San Simeon, and along the US101 corridor between San Miguel and Santa Maria – including the very steep and long US101 Cuesta Grade just north of the city of San Luis Obispo. Many of our buses operate greater than 275 miles per day.

Please that I formerly oversaw the Hydrogen bus demonstration program when I managed the Unitrans bus system in Davis, CA. I know from first-hand experience the challenges of this technology, and it was only the partnership with the Fuel Cell Partnership in nearby West Sacramento and the assistance of campus researchers that we were able to keep things (barely) moving forward. We ended up removing the “first Hydrogen station on the CA Hydrogen Highway” from our operating facility in 2010. I do not believe it is the appropriate technology for us based on the RTA’s remote location and lack of support staff. This leaves only Battery Electric Buses (BEBs) as the remaining technology that could allow us to meet CARB’s proposed new rule.

Because our agency operates fewer than 100 buses and our service area is currently not in a NOx non-attainment area, we would not be subject to the proposed new rule until the 50% ZEB bus purchasing requirements impact us beginning in 2023. We are concerned that the steep terrain along our highways, as well as the very high summer temperatures and low winter temperatures in North County, will severely impact the usable range of a BEB and will require complex/expensive mid-route charging stations and/or additional fleet (the latter will not only increase capital costs, but also increase operating costs to switch-out buses). Based on conversations with Gardena Transit officials, driver abilities and especially weather can reduce the range of a BEB by 30%, which makes even BYD’s purported 300 mile range buses infeasible in our operating environment (add in the 10% Cuesta Grade and the range would likely plummet even further). We are currently working with Proterra to loan us a BEB to verify; even they are concerned about our operating environment and long-distance bus runs.

Another issue that affects range is operating BEBs at highway speeds. I personally own a 2015 Chevrolet Volt, and speeds above 50 mph drastically reduces the battery range of my vehicle. From what I have researched, this is even more of an impact with BEBs. I ask that CARB consider exempting transit agencies that regularly operate intercity routes that are longer than current and projected BEB single-charge range limits. An alternative is to delay the 2023 and 2026 requirements to purchase 50% and 75% (respectively) ZEBs by six years to 2029 and 2031 for small and medium-size transit agencies in counties that do not have a countywide sales tax initiative; those of us in non-self help counties do not have access to the level of capital and operating funds necessary to fully and effectively implement ZEBs.

On another front, I would also ask that CARB work with Caltrans and the Legislature to incentivize transit operators in rural and small urbanized areas that implement ZEBs to obtain relief from the Transportation Development Act farebox recovery ratio requirements. The current 10% and 20% farebox recovery ratio requirements are difficult for many of us to achieve, and this will only get worse as planned increases to California minimum wage levels put pressure on us to raise our agency’s wages. Maybe a 5% “credit” could be applied to small transit agencies that get on the leading (bleeding?) edge of this ZEB technology.

San Luis Obispo Regional Transit Authority

I am cc'ing Andrew Mutziger from the SLO County APCD, as well as Pete Rodgers from the SLO Council of Governments, so that they are aware of my concerns. I look forward to hearing from you on how our unique challenges could be addressed in the final rule.

Geoff Straw
Executive Director
San Luis Obispo Regional Transit Authority
179 Cross Street
San Luis Obispo, CA 93401
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California Transit Association's INITIAL DRAFT Zero-Emission Bus Deployment Proposal

Highlights:

The California Air Resources Board (ARB) shall, in 2018, adopt a regulation containing the following elements –

- All transit agencies operating in California are required to transition their transit bus fleets to 100% zero-emission by 2040
- The ARB, working alongside transit agencies, directs initial funding to deploy zero-emission buses (ZEBs) (equal in # to the ZEBs that would have been purchased under the draft ICT mandate, from 2020-2023) in disadvantaged communities and non-attainment areas of the state
 - This ensures communities most impacted by poor air quality, and agencies with the dirtiest fleets, are first in line for ZEB deployments
- By 2020, each transit agency is required to develop and submit an individualized ZEB deployment plan to ARB that details its strategy for reaching 2030 and 2040 ZEB deployment targets (with the 2040 target required to be 100% zero-emission)
 - This approach provides transit agencies with the opportunity to plan for their transition to a ZEB fleet, similar to LA Metro in their [Strategic Plan for Metro's Transition to Zero-Emission Buses, adopted October 2017](#) and King County METRO (Seattle) in their [Feasibility of Achieving a Carbon-Neutral or Zero-Emission Fleet, finalized March 2017](#)
- ARB monitors each transit agency's progress toward fulfilling its ZEB deployment plan, and may impose an agency-level purchase mandate, under specified conditions beginning 2025, ensuring the 2040 ZEB deployment target is met

To reach these goals, each transit agency shall:

1. Beginning 2018, apply for funding to support the guaranteed deployment of approximately 350 ZEBs throughout the state from 2020 to 2023, consistent with the estimated deployment of ZEBs under the draft ICT's proposed purchase mandate in this timeframe
 - Access to funding shall be made available first and foremost, and with equal consideration, to: transit agencies serving disadvantaged communities and/ or Federally-designated non-attainment areas of the state; and/or, transit agencies with experience in the deployment of ZEBs and the potential to demonstrate the scalability of the technology
 - This preference for disadvantaged communities and/or Federally-designated non-attainment areas of the state, and transit agencies with experience in the deployment of ZEBs shall end in 2023
 - Wherein "funding" means: for the *incremental additional cost* of ZEB technology compared to available baseline non-ZEB technology
 - Wherein "funding" means: VW settlement funding or other new sources, and does not mean the redirection of, or the application of new requirements to, the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP), Transit and Intercity Rail Capital Program (TIRCP) or Low Carbon Transit Operations Program (LCTOP)
2. By 2020, develop and submit a transit electrification plan to ARB that details its individualized strategy for reaching its 2030 ZEB deployment target, and, a fully electrified bus fleet by 2040

California Transit Association's INITIAL DRAFT Zero-Emission Bus Deployment Proposal

- This plan shall be updated in 2022 and 2024, and as necessary
- 3. Beginning 2021, submit data annually to ARB on ZEB deployments and purchases, as well as ZEB cost and performance
 - By 2019, transit agencies shall work with ARB to define the data and metrics necessary for reporting costs and performance, as well as the procedures for submitting the data to ARB, so ARB is able to measure agency performance against the benchmarks called for in number 5, below

To ensure progress toward these goals, ARB shall:

- 4. In 2018, estimate the through-2023 incremental additional cost to transit agencies of the regulation, and develop and secure a 5-year funding plan (covering 2018-2023) necessary to deploy approximately 350 ZEBs plus charging infrastructure from 2020 to 2023
 - Wherein “funding” means: for the *incremental additional cost* of ZEB technology compared to available baseline non-ZEB technology
 - Wherein “funding” means: VW settlement funding or other new sources, but does not mean the redirection of, or the application of new requirements to, HVIP, TIRCP or LCTOP
- 5. In 2018, establish, in coordination with transit agencies and manufacturers, benchmarks for future ZEB cost (including purchase costs, and, electricity rates), performance and weight, compared to future non-ZEB vehicle cost, performance and weight (i.e. so any remaining incremental additional cost increase of ZEBs above the baseline cost for non-ZEBs can be identified)
- 6. In 2018, adopt a commitment to require interoperability between the ZEBs and charging infrastructure offered by different manufacturers
 - The specific standards and protocols for interoperability shall be developed by ARB, transit agencies and manufacturers, in coordination with academic experts
 - Interoperability shall include depot charging infrastructure, including overhead charging, and in-ground inductive charging
- 7. Beginning 2021, monitor the compliance of each transit agency with its transit electrification plan
- 8. In 2023 and every two years thereafter, initiate an independent and/ or peer-reviewed analysis of key measures, including, but not limited to:
 - The status of statewide ZEB deployment relative to statewide goals
 - Bus technology, including upfront capital costs (i.e. ZEB, charging infrastructure and necessary utility upgrades), total cost of ownership (i.e. upfront capital costs, operational costs and maintenance costs), battery density (BEB)/range, battery degradation, operational performance, weight, relevant advances and market availability
 - These measures will be compared against benchmarks established in the initial rulemaking process (see number 5, above)
 - Barriers to electrification, including funding, infrastructure and utility rates
 - These measures will be compared against benchmarks established in the initial rulemaking process (see number 5, above)

California Transit Association's INITIAL DRAFT Zero-Emission Bus Deployment Proposal

9. In 2023 and every two years thereafter, report to the Board on the findings of the report, as part of a public hearing
 - The Board may alter the regulation based on report findings
10. Subject to the independent/peer-reviewed findings, in 2025 and every two years thereafter, if ARB finds that expected costs, performance and weight benchmarks are being met, adequate funding is available statewide (and to the transit agency, specifically), but, an agency has nonetheless not yet made appropriate progress to reach its 2030 ZEB deployment target and/ or a fully electrified bus fleet by 2040, as outlined in accordance with its transit electrification plan, ARB shall institute a purchase mandate for that agency to ensure these targets are met

Other provisions:

Funding

11. All current funding programs shall continue, pending appropriation, to provide financial support to transit agencies for ZEB purchases
12. Utilities shall be wholly responsible for upgrading and providing sufficient electricity to transit agencies to begin deployments in 2020 and to achieve 100% deployment in 2040
 - Electric companies shall not charge transit agencies for such upgraded services

Vehicle Specifications

- The regulation shall apply only to transit buses above 26,000 lbs. gross vehicle weight (GVW), and shall defer its applicability to cutaways and over-the-road coaches
 - Applicability to cutaways and over-the-road coaches shall be revisited in 2030
- The regulation shall not require turnover of electric trolley buses to battery-electric or hydrogen fuel cell
- A ZEB shall be considered commercially available only if it meets the curb weight schedule established by current law
- All transit agencies operating in Federally-designated non-attainment areas shall purchase low NOx engines, if available, at the time of otherwise-allowable conventional bus purchase
- For otherwise-allowable conventional bus purchases, all transit agencies must purchase renewable fuels when diesel or natural gas contracts are renewed, pending availability

Compliance

- Maintains the ability for transit agencies to submit a joint-compliance plan (i.e. as in the draft ICT)
- Maintains credit for innovative mobility options, which must be approved the ARB Executive Officer (i.e. as in the draft ICT)