

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

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