



AFFILIATED AGENCIES

*Orange County
Transit District*

*Local Transportation
Authority*

*Service Authority for
Freeway Emergencies*

*Consolidated Transportation
Service Agency*

*Congestion Management
Agency*

September 12, 2022

Ms. Liane M. Rudolph
Chair
California Air Resources Board
1001 "I" Street
Sacramento, CA 95814

Subject: Innovative Clean Transit Regulation Update and Comprehensive Review on 2023 Program Readiness

Dear Chair Rudolph:

The Orange County Transportation Authority (OCTA) appreciates the opportunity to offer comments on the Comprehensive Review of California's Innovative Clean Transit (ICT) Regulation: Phase I Summary Report (Report), to be presented to the California Air Resources Board (CARB) on September 22, 2022. As directed in CARB Resolution 18-60, adopted concurrently with the ICT regulation in 2018, the ICT Report offers the first chance to review how zero-emission technology has worked in practice statewide, in various operating conditions, since the adoption of the ICT. This type of analysis is critical for agencies to have, not only to inform any purchase mandate being implemented, but also for each transit agency to understand the challenges and benefits any technology may offer. In addition, the data from the ICT Report helps ensure the technology is meeting the expectations of CARB when the ICT was adopted, including that related to cost and reliability, and the prevention of any negative impacts on a transit agency's ability to maintain essential transit service. OCTA welcomes follow-up reports of this kind moving forward, including the Phase II report to be delivered in 2024.

Prior to the adoption of the ICT, OCTA already operated one of the cleanest transit fleets in the State, operating almost entirely on renewable natural gas, and with repowers utilizing low oxides of nitrogen engines. Since the adoption of the ICT, OCTA has proactively sought to secure detailed experience operating zero-emission buses of various technologies. OCTA submitted its ICT roll-out plan to CARB, on schedule, on June 30, 2020. This roll-out plan represented OCTA's best understanding, at the time, of how the agency planned to phase to a zero-emission fleet by 2040. Because of the unique operating environment OCTA's transit service operates within, it was determined that testing both hydrogen fuel-cell and battery-electric buses would afford the opportunity to determine which technology works best in various bus routes, services, and operating environments before committing to either, or both, technologies.

Recognizing the policy direction of the State towards zero-emission technology, prior to the adoption of the roll-out plan, OCTA worked with various private and public partners, and CARB, to secure funding to help implement a pilot of hydrogen-fuel cell technology. This included the construction of the largest hydrogen fuel-cell fueling station for transit purposes in the country and the purchase of ten hydrogen fuel-cell buses. OCTA is also scheduled to start testing battery-electric technology later in 2022, with the arrival of ten electric battery buses. In order to inform later requirements of the ICT, OCTA was also recently awarded funding from the federal Low or No Emissions Program, to procure ten zero-emission cutaway buses to test for paratransit service. These technology pilots will ensure that OCTA is able to have the data necessary to expand its zero-emission fleet as funding becomes available, and pursuant to the timeline in the agency's roll-out plan.

As an early adopter of zero-emission technology, OCTA appreciates the early inclusion of transit agencies in the development and drafting of the ICT Report. Each transit agency, including OCTA, has more robust experience in the operation of zero-emission technology to inform such report through real-life experience. While OCTA understands CARB will be moving forward in implementing the 2023 purchase requirement, the ICT Report highlights the continued challenges associated with zero-emission technology. Through OCTA's own experience this includes:

- **Procurement Cost:** The cost of procuring a zero-emission bus is still as much as twice the cost of existing natural gas buses. Cost parity has been mitigated little, if at all, since the adoption of the ICT, although as the ICT Report notes, the costs have come down from the early 2000s. The ICT Report cites several funding sources to assist in bringing down these costs. While those funding opportunities have proven valuable, almost every program is discretionary in nature and vastly oversubscribed, which prevents agencies from relying on them long-term. In addition, many of these programs will not allow continued eligibility for agencies seeking to comply with regulatory requirements.
- **Availability:** OCTA strives to maintain a standard of 80 percent bus availability to sustain operations. When compared to OCTA's current compressed natural gas (CNG) fleet which currently averages 78 percent availability, the hydrogen fuel cell buses (FCEB) are averaging 57 percent. Without significant improvements, such availability would prevent OCTA meeting its daily operation needs if FCEBs were expanded.
- **Miles Between Road Calls (MBRC):** OCTA's standard for its transit fleet is to maintain 14,000 MBRC. The FCEBs are currently averaging 8,961 MBRCs and holding steady. In their initial year in operation, the FCEBs experienced

several issues that were resolved with software adjustments. Battery and fuel cell failures began to appear approximately 18 months later, and now account for 20 percent of total failures. While some of this issue may be explained due to these buses being some of the first of its technology built by the manufacturer, this will be necessary to improve over time. Otherwise, this will increase overall costs of the technology transition. In comparison, OCTA's CNG fleet, which composes a significantly larger percentage of OCTA's fleet, currently is averaging 35,461 MBRC.

- **Fuel Economy:** The FCEB fuel economy is 2.3 times better than that of the CNG bus, helping to offset the high cost of hydrogen fuel. The cost per mile for hydrogen fuel is \$0.99 compared to CNG fuel at \$0.45.
- **Cost Per Mile:** Total cost per mile (CPM) considers the cost for parts, labor and fuel, divided by miles traveled. CPM for FCEB parts and labor is 16 percent lower than CNG buses, \$0.71 versus \$0.82. However, when fuel cost is added, FCEBs are 15 percent higher than CNG buses, \$1.70 versus \$1.27.
- **Range:** As the ICT Report notes, zero-emission technology still does not afford a 1:1 comparison in regards to range. While FCEBs have better results related to range, the overall costs of such technology, may be a deterrent. For agencies such as OCTA, who require buses to meet much longer range requirements, up to 300 miles in some circumstances, this could lead to overall higher costs to meet the ICT mandates.

If parity is not achieved between zero-emission technology and existing natural gas buses in all of the above metrics, this will require transit agencies to expand their fleets to ensure service is not disrupted. This will not only have significant cost implications, but also will have potential ramifications on an agency's federal spare ratio and useful life requirements. In addition, as the ICT Report acknowledges, unanticipated challenges associated with the coronavirus pandemic have also injected new variables into how transit agencies may ultimately roll out zero-emission technology, as agencies project future funding resources, seek to attract ridership, and restructure services to meet current demands. While OCTA will continue to implement its ICT rollout plan, the ARB should consider several recommendations as enforcement of the ICT continues, to prevent any unintended consequences on transit service:

- **Regular reporting.** While the ICT Report does indicate a Phase II of the ICT Report in 2024, more regular reporting after that would be helpful in not only understanding the status of the technology, but also in analyzing recommendations for improvements in the regulation and policies to allow

for more seamless transition. It can also be used to allow advance warning of continued issues that may exist related to cost, reliability and performance. This should continue to be done in consultation with transit agencies to ensure real-world data.

- **Needs Assessment.** The ARB could lead efforts to better understand the funding differential for agencies to meet ICT requirements. By having more data on the delta that exists, this could inform future funding asks at both the state and federal levels.
- **Streamline Funding Programs.** As the ICT Report acknowledges, there is a complex maze of funding programs for the transition to zero-emission technology, some of which are either not allowed to be layered, are required to be the last funding in, or preclude agencies from seeking funding if used to meet regulatory requirements. Improved coordination between funding programs and clearer eligibilities could assist agencies in obtaining necessary fundings. This could include consistency in eligibilities, a singular application process, and the ability to layer programs and maintain eligibility throughout the ICT. Further, CARB should work with transit agencies to seek more formula-based programs to allow predictability for transit agencies in future procurements.
- **Expand Existing Programs to Cover Battery-Electric and FCEBs.** Many current incentives, including the low-carbon fuel standard and federal alternative fuel tax credit, should be clarified to explicitly allow agencies to be eligible for these incentives for all fuel types. Currently, there are limits to how an agency can implement these programs, which may deter agencies from certain technologies.
- **Fuel Cost Structures.** More work is needed to ensure that transit agencies can obtain existing tariff structures for electricity costs, and lower cost hydrogen fuel. As an essential public service, transit should receive priority for these incentives. Currently fuel cost is the second largest capital cost driver for FCEBs, beyond the initial upfront capital cost.

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OCTA looks forward to partnering with the ARB on the continued implementation of the ICT and discussing these recommendations for improvement and those recommended by the California Transit Association. If you or your staff have any questions regarding OCTA's feedback on the ICT Report, please contact Kristin Jacinto, Manager of State and Federal Relations, at (714) 560-5754 or kjacinto@octa.net.

Sincerely,



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Chief Executive Officer

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