



Foothill Transit

June 5, 2018

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

Re: Foothill Transit Comments on Innovative Clean Transit Regulation

Dear Chair Nichols and Members of the Air Resources Board:

On behalf of Foothill Transit, I very much appreciate the opportunity to submit to you these comments on the California Air Resources Board (CARB) proposed Innovative Clean Transit Regulation (ICT). Foothill Transit was the first transit operator to place heavy-duty fast-charge electric buses into service and we continue to pioneer the deployment of electric buses. We have committed to electrifying our entire fleet of 373 buses by the year 2030 and we are very excited about the future of this technology!

By way of background, Foothill Transit provides transit service to the San Gabriel Valley region in eastern Los Angeles County. We are the leader in electric bus deployments statewide. Today, we have 30 Proterra electric buses on the road, moving passengers every day, and since 2010 have logged over 1.5 million electric miles. In our experience with these vehicles, we have learned tremendously and have had to overcome some challenges as one of the pioneers of this technology. We believe that our experience can greatly inform the efforts of CARB to move the entire transit industry toward the deployment of electric transit buses.

We have been engaged with staff at CARB for more than two years as it has worked to craft the ICT regulation, formerly named Advanced Clean Transit. We value the efforts of CARB staff in engaging transit agencies, the California Transit Association (CTA), and other stakeholders on the topic, and hosting workshops across the State. We also appreciate this opportunity to provide feedback on the proposed regulation.

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Our experience over the past eight years has given us insights into electric bus deployment that we encourage CARB consider to ensure the proposed regulation is implementable:

Regulation start date and schedule: Through hard-learned lessons, we have seen that rolling out an electric bus program takes time, and can encounter roadblocks outside the control of transit agencies that can delay a project. For example, we are currently working through unexpected challenges in deploying depot chargers to support our extended range buses, including finding the right depot solution. We are working to address these issues, but it takes time. The proposed regulation asks transit agencies to march in lockstep, increasing electric bus deployments on a set schedule through 2030. This approach does not adequately take into account the reality that each agency in the State is different and will inevitably face issues that are agency-specific. Based on our experience, we would argue that this approach does not give agencies the flexibility, or planning horizon, they will need to successfully deploy an electric fleet.

We recommend that the regulation should afford agencies as much flexibility as possible, while meeting CARB's statewide target for 2040.

Vehicle Range and Performance: Foothill Transit initially deployed a fleet of 15 fast-charge, short range buses. These buses require costly on-route charging infrastructure and have required us to completely redesign our timetable on the lines in which these vehicles operate to accommodate frequent charge cycles. This has proven to be a fairly complex and complicated task.

Most recently, we have taken delivery of 14 extended range buses. While we are very early in the deployment of these coaches, the initial range of the buses is ranging from 150 to 190 miles on a charge. This is significantly less than the 350 mile range we are able to achieve with our CNG powered coaches. Thus, today, it is not a one-to-one replacement with this new technology.

We are working closely with our bus manufacturer to improve range and performance, we are optimistic that range will increase to the point where an electric bus will be able to perform in service similarly to a CNG or diesel powered coach. We are not there today. We are more than willing to provide you with any of our real-world performance data as that information could be valuable as you prepare the regulation. We believe that it is critical to look at actual data, to ensure that the data is unbiased in way, and that it achieves University research standards.



We strongly encourage CARB to recognize the current state of vehicle performance in your rulemaking. We further encourage CARB to require independent research, analysis and information sharing to support the industry wide development of electric transit buses. Further, we strongly urge CARB to assist in providing the resources and the "risk capital" so that transit operators and manufacturers can continue to advance electric buses toward real-world performance that is comparable to CNG and diesel powered coaches.

Availability of incentive funding: As we grew our electric program, we have been very fortunate to receive support from State programs like HVIP. These programs have been very helpful in partially offsetting the incremental cost of electric buses. However, our understanding is that once electric buses become required under the proposed regulation, transit agencies may no longer be able to access HVIP and other state sources unless they are exceeding their baseline requirements. This would be a double-whammy for transit agencies – first, they would be put on an accelerated electric bus path for compliance, and second, they would lose access to a tool they would use to meet that compliance requirement.

We recommend that CARB allow HVIP and other State programs to be accessible by agencies to meet regulatory compliance.

Electric Infrastructure costs: At this phase of our electric bus deployment, we are finding that the greatest challenge is not the vehicles, but the infrastructure needed to charge them. These high-power electric infrastructure projects are extremely complex, and currently there are no existing operational models for how to successfully design and manage a full depot of bus chargers, particularly in more densely developed urban and suburban settings. We are making progress on overcoming this challenge, including launching an infrastructure feasibility study and working closely with our local electric power utility. However, it is clear that the infrastructure component will add cost, complexity, and possible delays to an electric bus rollout.

We encourage that the rulemaking includes a focus on technical support for and funding to allow for early initial installations of electric bus charging infrastructure. A key emphasis of these deployments should be to determine best practices for electric bus charging infrastructure and to disseminate this early learning throughout the California transit industry.

Resiliency in Unexpected Conditions: One of the areas that we believe requires significant further exploration as we expand the statewide fleet of electric buses is resiliency, particularly in the event of natural disasters. Our current fleet of CNG powered buses can be fueled without the need for electric power. Further, the



nature of the natural gas pipeline is such that if a part of the pipeline is damaged, there are backup connections to get fuel in our transit buses. Thus, we should be able to maintain some level of operations in the face of a natural disaster.

With electric buses, if the power grid goes down for any reason, the buses quickly become unusable. We believe that this is an area that has not been explored or evaluated fully.

One of the projects that we are in the very initial stages of working on is to establish alternate electric power creation opportunities that could be employed in the face of a natural disaster or power outage. We are just beginning to explore the possibility of using a stationary fuel cell as a backup electric power source. While fuel cells have been used in a wide range of applications, we do not know of an application where they have been used to support an electric bus fleet.

Again, we are in the very early stages of this project and we are not sure what challenges we will encounter. We expect there will be some, which is part of the learning process.

We urge CARB as part of this regulation take into account the issue of resiliency and operation during events like natural disasters. We further urge CARB to provide funding and technical support to explore these issues and implement real world solutions.

Electric Power Rates: One of the biggest challenges we have faced in the deployment of our electric bus fleet is the cost of energy. We have worked with the National Renewable Energy Laboratory (NREL) to do a head-to-head comparison of the electric bus fleet compared to our existing CNG buses¹. What NREL independently and objectively determined was that the scheduled maintenance costs of our electric bus were 36 percent lower than our comparable CNG fleet. At the same time, the cost for energy was 64 percent higher for our electric bus fleet. The reduced maintenance costs were minimal compared to the higher electric costs.

If we were to convert our entire vehicle fleet to electric vehicles using the vehicles available today, our total cost for energy would increase by at least 40 percent. With our current overall financial constraints, we don't have the funding to cover this additional operating cost.

¹ Eudy, Leslie and Jeffers, Matt, *Foothill Transit Battery Electric Bus Demonstration Results, Second Report*, June 2017. Available at <https://www.nrel.gov/docs/fy17osti/67698.pdf>.



We do believe that changes in the power rate structure combined with smart grid energy consumption can lower the cost of energy. To make this happen CARB, the California Public Utilities Commission, the California Energy Commission, manufacturers and transit operators all need to work together to find solutions.

We urge CARB to include financial resources and technical support to move the cost of energy for electric buses to be closer to the cost for CNG and diesel buses. We further urge CARB to bring its resources to influence all of the organizations noted together to work collaboratively toward solutions to the energy cost challenge.

California Transit Association Proposal: Foothill Transit has long been an active member of the California Transit Association. I have personally served on the Association's Executive Committee and had the honor of serving as Chair of the organization's Policy Board. We have been working closely with our transit colleagues through the Association on this issue.

In light of the issues we noted in our various categories above, we ask that you consider adopting the California Transit Association's counterproposal. Their proposal would accomplish all of the goals that CARB seeks to accomplish, but would do so in a way that gives transit agencies the flexibility and tools they need to successfully convert to electric buses.

The counterproposal presented to you by the Association offers an appropriate level of flexibility, while remaining true to the intent and end objective of the ICT regulation. The counterproposal would require each agency in the state to develop, submit and implement an individualized zero-emission bus deployment by 2020 that would guarantee a transition to a fully electric fleet by 2040. This process will allow agencies to proactively consider and find solutions to agency-specific challenges, alongside their bus manufacturer, utility company, and local stakeholder groups. Importantly, the counterproposal also considers the scalability of electric buses by requiring CARB to direct funding to, among other things, agencies with demonstrated experience deploying zero-emission buses. This process will allow early adopters, like Foothill Transit, to continue to lead on electrification, while generating valuable data and approaches that could be shared with other agencies to support their transition to zero-emission.

Finally, to address concerns that these processes will be too lax, the counterproposal requires CARB to develop benchmarks for the cost and performance for zero-emission buses as well as for funding. If, starting in 2025, CARB finds that these cost and performance metrics are being met and sufficient funding is available, but determines that a transit agency has not yet made



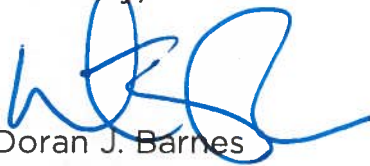
Mary Nichols
June 5, 2018
Page 6

appropriate progress to reach its 2030 ZEB purchase target or 2040 fleet goal, CARB can institute a purchase mandate for that agency to ensure these targets are being met.

The goals and commitment of Foothill Transit are very much in alignment with the goals of the proposed regulation. We stand ready to continue to lead in the deployment of electric buses and to support our sister transit organizations as they also embark on this journey. To do that, we need the financial and technical support to overcome challenges and share our learnings.

Thank you for your consideration. If we can provide any additional information or clarification, please do not hesitate to contact me. Further, if we can be of assistance in providing the perspectives of a transit operator who is expanding knowledge of electric transit buses on a daily basis, we stand ready to assist.

Sincerely,



Doran J. Barnes
Executive Director

cc: Foothill Transit Executive Board
California Transit Association

