MEETING

STATE OF CALIFORNIA

AIR RESOURCES BOARD

CALEPA HEADQUARTERS

BYRON SHER AUDITORIUM

SECOND FLOOR

1001 I STREET

SACRAMENTO, CALIFORNIA

THURSDAY, APRIL 27, 2017

9:09 A.M.

JAMES F. PETERS, CSR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 10063

A P P E A R A N C E S

BOARD MEMBERS:

Ms. Mary Nichols, Chair

Ms. Sandra Berg, Vice Chair

Dr. John Balmes

Mr. Hector De La Torre

Mr. John Eisenhut

Senator Dean Florez

Supervisor John Gioia

Ms. Judy Mitchell

Mrs. Barbara Riordan

Supervisor Ron Roberts

Supervisor Phil Serna

STAFF:

Mr. Richard Corey, Executive Officer

Dr. Alberto Ayala, Deputy Executive Officer

Ms. Edie Chang, Deputy Executive Officer

Mr. Kurt Karperos, Deputy Executive Officer

Ms. Ellen Peter, Chief Counsel

Ms. La Ronda Bowen, Ombudsman

Ms. Emily Wimberger, Chief Economist

Ms. Veronica Eady, Assistant Executive Officer

Mr. Alvaro Alvarado, Manager, Health and Ecosystems Exposure Section, RD

A P P E A R A N C E S C O N T I N U E D

STAFF:

Mr. Michael Benjamin, Division Chief, Monitoring and Laboratory Division

Mr. Bart Croes, Division Chief, Research Division

Ms. Vicky Davis, Senior Attorney, Legal Office

Ms. Shannon Dilley, Attorney, Legal Office

Ms. Shannon Downey, Air Resources Engineer, Specialized Fleet Enforcement Section, Enforcement Division(ED)

Dr. Walter Ham, Air Resources Engineer, Measurement Assessment and Research Section, Monitoring and Laboratory Division(MLD)

Mr. Jorn Herner, Branch Chief, Research Planning and Emission Mitigation, RD

Ms. Debbie Kerns, Senior Attorney, Legal Office

Mr. Jack Kitowski, Division Chief, Mobile Source Control Division

Ms. Neva Lowery, Air Pollution Specialist, Mobile Source Control Division(MSCD)

Ms. Lori Miyasato, Health and Ecosystems Assessment Section, Research Division(RD)

Ms. Sarah Pittiglio, Climate Action and Research Planning Section, RD

Ms. Heather Quiros, Branch Chief, Diesel Programs Enforcement Branch, ED

Mr. David Salardino, Manager, Carl Moyer Off-Road Section, MSCD

Dr. Todd Sax, Division Chief, Enforcement Division

Ms. Annalisa Schilla, Section Lead, Climate Action and Research Planning Section, RD

A P P E A R A N C E S C O N T I N U E D

STAFF:

Ms. Linda Smith, Chief, Health and Exposure Assessment Branch, RD

Mr. Doug Thompson, Manager, Incentives Oversight Section, MSCD

ALSO PRESENT:

Mr. Alan Abbs, California Air Pollution Control Officers Association

Mr. Tim Carmichael, Sempra Energy Utilities

Ms. Sean Edgar, Clean Fleets

Mr. Andre Freeman, California Energy Commission

Mr. William Glover, Ethnic Environment

Ms. Bonnie Holmes-Gen, American Lung Association in California

Mr. Dave Johnston, El Dorado Air Quality Management District

Mr. Thomas Lawson, California Natural Gas Vehicle Coalition

Mr. Bill Magavern, Coalition for Clean Air

Mr. Fred Minassian, South Coast Air Quality Management District

Mr. Brian Shobe, CalCAN

Mr. Eleanor Torres, Incredible Edible Community Garden

Ms. Eileen Tutt, CalETC

I N D E X

I N D E X C O N T I N U E D

P R O C E E D I N G S

CHAIR NICHOLS: Good morning, ladies and gentlemen. Welcome to the April 27, 2017 public meeting of the Air Resources Board. The meeting will now come to order and we will begin with the pledge allegiance to the flag.

(Thereupon the Pledge of Allegiance was recited in unison.)

CHAIR NICHOLS: Would the clerk please call the roll.

Got a microphone there?

Yes. Good. Okay. Great.

BOARD CLERK McREYNOLDS: Okay. Dr. Balmes?

BOARD MEMBER BALMES: Here.

BOARD CLERK McREYNOLDS: Mr. De La Torre?

BOARD MEMBER DE LA TORRE: Here.

BOARD CLERK McREYNOLDS: Mr. Eisenhut?

BOARD MEMBER EISENHUT: Here.

BOARD CLERK McREYNOLDS: Senator Florez?

BOARD MEMBER FLOREZ: Here.

BOARD CLERK McREYNOLDS: Assembly Member Garcia.

Supervisor Gioia?

BOARD MEMBER GIOIA: Here.

BOARD CLERK McREYNOLDS: Senator Lara?

Ms. Mitchell?

BOARD MEMBER MITCHELL: Here.
BOARD CLERK McREYNOLDS: Mrs. Riordan?
BOARD MEMBER RIORDAN: Here.
BOARD CLERK McREYNOLDS: Supervisor Roberts?
Supervisor Serna?
BOARD MEMBER SERNA: Here.
BOARD CLERK McREYNOLDS: Dr. Sherriffs?
Professor Sperling?
Ms. Takvorian?
Vice Chair Berg?
VICE CHAIR BERG: Here.
BOARD CLERK McREYNOLDS: Chair Nichols?
CHAIR NICHOLS: Here.
BOARD CLERK McREYNOLDS: Madam Chair, we have a quorum.
CHAIR NICHOLS: Great. Thank you.
Just a couple of the mandatory housekeeping announcements before we begin the meeting. To remind anybody who is new here, that if you want to testify, we need you to fill out a request-to-speak tarred. They're available in the lobby outside this Board room. Please turn the card into the Board assistant or the Clerk over here before the item that you want to talk on appears.
Also, when you do, be aware that we will be imposing a three minute time limit. Please state your

name when you first come up to the podium, and then put your testimony into your own words. It's much easier and more efficient than if you actually read it. And anything you submit to us in writing will be entered into the record of the proceeding.

Also, for safety reasons, I need to remind you to check where the emergency exits are. There are two of them at the rear of the room. And if there's a fire alarm, we're required to evacuate this room immediately, and go down the stairs and out of the building until the all-clear signal is given.

I think that's it for any kind of opening remarks. We will be holding a closed session today after the close -- after the end of all of the items that are on the agenda. And if any action is taken during that session, then we'll come back out and announce any decisions that were made before we formally adjourn.

So let's get started. The first item is on consent. It's the public meeting to consider the Coachella Valley Attainment Ozone Contingency Measure.

And I need to ask the Board Clerk if we have any witness who have signed up to testify on this item?

BOARD CLERK McREYNOLDS: (Shakes head.)

CHAIR NICHOLS: We do not.

Is there any Board member who would like to see

this item removed from the consent calendar?

Seeing none. I will close the record.

And have all the members of the Board had a chance to review the resolution?

Can I have a motion and a second to adopt Resolution 17-13?

BOARD MEMBER RIORDAN: I would so move, Madam Chair.

BOARD MEMBER GIOIA: Second.

CHAIR NICHOLS: We've got a motion and a second here.

And will all in favor please say aye?

(Unanimous aye vote.)

CHAIR NICHOLS: And noes?

Any abstentions?

Okay. We then move on to the second item on the consent calendar. Updates to the San Joaquin Valley PM10 Maintenance Plan.

Madam Clerk, has anyone signed up to testify on this item?

BOARD CLERK McREYNOLDS: (Shakes head.)

CHAIR NICHOLS: No. Are there any Board members who would like this item to be removed from the consent calendar?

Mr. Eisenhut.

BOARD MEMBER EISENHUT: Yes. Chair Nichols, I would request that we pull Item 17-14 from the consent calendar. And I intend to support the item, but I would like to hear some more details from staff before we take action. And I intend to make a statement following staff presentation about the need for San Joaquin Valley Air District to do more to protect the health of San Joaquin Valley residents.

CHAIR NICHOLS: Any Board member who wishes to pull an item off of consent, may do so. And so the item is no longer on the consent calendar. We will ask Mr. Corey to summarize the item. And I understand that there is someone who wants to comment. They'll have their the turn after the presentation.

EXECUTIVE OFFICER COREY: All right. As background, the valley attained the federal PM10 standard in 2006. And it subsequently developed a maintenance plan that was approved by EPA in 2008. The maintenance plan outlined contingency provisions that the District would undertake should exceedances of the PM10 standard occur.

These provisions required the district to conduct an assessment of the nature of the exceedances and identification of potential remedies.

In 2016, as part of the process to update the maintenance plan's the transportation conformity budgets,

ARB committed to provide U.S. EPA with a SIP revision documenting the nature and causes of PM10 exceedances that occurred in the valley in 2013 and 2014. So there were exceedances during those two years. In the report being considered today, ARB staff assessed the available information for each exceedance and identified whether those exceedances qualifies as an exceptional event or was caused by man-made sources.

Based on this identification, the next step is for the District to prepare the necessary documentation for U.S. EPA to formally identify the events as natural or exceptional, as well as identify further measures to reduce emissions contributing to the remaining exceedances.

In response to Mr. Eisenhut's question, I always want to provide a little context about the circumstances leading up to this report. As noted, the district was required to do a technical analysis of the weather conditions on those exceedances -- on those exceedance days, each one, to determine if there were more the district needed to do to reduce emissions, or if the violations were outside of the District's ability to control. That analysis was first required in 2015.

The District didn't complete that analysis. So to avoid sanctions last year, ARB committed on the

District's behalf to complete the analysis by this coming June, this analysis here.

The District subsequently did minimal analysis and pointed to the drought as the reason. But the Clean Air Act requires that the District protect public health even under drought conditions, so the analysis didn't satisfy federal law.

In order to prevent the region from failing conformity and losing transportation funds, ARB staff provided the more rigorous analysis. And if you approve the item today, the District must now follow through with the actions identified in the ARB analysis -- more detailed analysis that meets federal law and development of further measures to reduce fugitive dust as part of the upcoming plans.

That concludes my remarks.

CHAIR NICHOLS: Thank you.

Would you like to comment or should we hear from the witness next?

Did you have any additional comment you want to

BOARD MEMBER EISENHUT: I do. Thank you.

CHAIR NICHOLS: But -- okay. Shall we hear from Mr. Magavern who is our one witness who signed up?

Let's go ahead and hear from him.

MR. MAGAVERN: Thank you, Madam Chair and Board

members. Bill Magavern with the Coalition for Clean Air. First, let me apologize to the Board and the clerk. I only submitted my card a couple minutes before you came to the item. And that's because it was at 8:56 this morning I got a call from Fresno asking me to speak on this item.

And that's for a good reason. The advocates in the San Joaquin Valley couldn't be here. So what -- what they're asking, and we're asking, is that the Board take this opportunity to look at, not only PM10, but also PM2.5 in the San Joaquin Valley, because some of the control measures that would -- you would use to reduce PM10 would also help to reduce PM2.5.

And as you know, at the hearing last October in Fresno, you started a process where advocates had been working with your staff and with the district to try to come up with further measures to reduce PM2.5.

The request that the advocates have now is that ARB staff provide modeling for control measures that have been suggested by the CVAC advocates in the San Joaquin Valley. And that would provide the basis for us to continue working with your staff and with the District, so that we know what could be achieved in further reductions of PM2.5.

Thank you.

CHAIR NICHOLS: Thank you. I might just comment

on that comment to say that my understanding is that we are having some discussions with the San Joaquin Valley District over additional modeling that needs to be done on several different items relating to their control strategy. And I'm wondering if this is something that can be folded into those discussions?

EXECUTIVE OFFICER COREY: It can be. In fact, there will be a workshop in the valley in the May time frame prior to our May update to the Board on the PM2.5 work that will also need to speak to this PM10 work. And it will include the modeling that Mr. Magavern is calling out.

CHAIR NICHOLS: Okay. Great. Sorry. I hijacked your item.

Go ahead, Mr. Eisenhut.

BOARD MEMBER EISENHUT: Thank you.

Thank you, Mr. Corey. I've listened to Mr. Corey. I've heard the one public comment. I've read the report, and I will be supporting this action. I'm prepared to make the motion at the end of my comments. But I -- I -- I wanted -- I want to just use this opportunity to see the District's analysis, because I do think there is more that the District needs to do as we deal with both PM2.5 and PM10.

I understand, as has been related, that next

month staff will be providing update on actions. I know staff has been working with the District in developing a PM2.5 plan. And that our direction -- the Board direction last October was that further actions by both the District and the ARB Board was necessary and appropriate. I also understand that this will be returning to us for action in the fall. So

I brought this item off, because I think it needs to be stated that the District needs to take this planning process seriously, and they need to do -- to do this in a more serious manner as we approach the PM2.5 than they end -- than they processed with the PM10. So that's -- with that, if there are no additional comments, I would offer a motion to approve.

VICE CHAIR BERG: Second.

CHAIR NICHOLS: We have a motion and a second.

BOARD MEMBER BALMES: Second.

CHAIR NICHOLS: Any additional comments from members of the Board.

If not, then I'll just call the vote.

All in favor of the motion please say aye?

(Unanimous aye vote.)

CHAIR NICHOLS: Opposed?

Abstain?

Already. Thank you very much.

Appreciate your bringing that forward.

Okay. The next item is an update on health research. We haven't had one of these for a while, but there is a tradition here of staff bringing to the Board periodic updates on research on the health effects of air pollution. This is a field which continues to thrive and to produce interesting an important results for our work.

So today's presentation is reviewing some reports, which I suspect many of us have seen in the regular news press concerning associations between air pollution exposure and effects on the brain.

Mr. Corey, would you please introduce this item.

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair Nichols.

The Board has previously heard reports on the adverse respiratory and cardiovascular effects of air pollution exposure, including increased hospitalizations and worsened asthma symptoms and even premature death.

However, much less is known about the ambient pollutants' effects on the brain. Findings from recent studies suggest associations between air pollution exposure and increased risk of dementia. Today, staff will provide a brief review of what is known about the adverse air pollution effects on the brain.

I'll now ask Lori Miyasato from our Health and

Exposure Assessment Branch to give the staff presentation.

Lori.

(Thereupon an overhead presentation was presented as follows.)

DR. MIYASATO: Thank you, Mr. Corey. Good morning, Chairman Nichols and members of the Board. In this research update, I will provide a brief summary of recent studies on the effects of air pollution exposures on the brain.

--o0o--

DR. MIYASATO: Over the past several months, news headlines have announced the discovery of links between air pollution and dementia. The message is startling, but articles are often based on a single study, and may not consider the findings in the context of prior knowledge.

Today, we will explore some of the evidence for links between air pollution exposure and adverse impacts on the brain.

--o0o--

DR. MIYASATO: While there is a large body of evidence supporting associations between air pollution exposure and cardiovascular and respiratory health endpoints, much less is known about air pollution's impacts on the brain.

The U.S. Environmental Protection Agency, and the

Health Effects Institute both conducted exhaustive literature reviews on health effects associated with exposure to particulate matter. Both noted the scarcity of studies on particulate effects on the brain, and recommended more research be done in this area.

Since these reviews were completed, additional studies have been published. Today, we'll be focusing on neurodegenerative effects, or the loss of brain cell structure and function, which can progress to disorders such as Alzheimer's disease and Parkinson's disease.

--o0o--

DR. MIYASATO: Probably the most convincing evidence of air pollution's effects on the brain come from over two decades of research conducted in Mexico. These studies compared children living in Mexico city, an area with high air pollution, versus those living in less polluted regions of the country.

The Mexico City children suffered worse health outcomes than the other children, including the following:

Breakdown of the brain's protective layer and the lining of the nasal cavity, changes in the brain that resemble the early stages of Alzheimer's disease, and poorer cognitive performance on standardized tests.

These findings seem pretty convincing. However, one shortcoming of the studies is that air pollution

exposure data were not collected. We know that Mexico City has high ambient pollutant levels, but it is not clear what pollutants or other potential factors might have been associated with the adverse health effects.

--o0o--

DR. MIYASATO: Some of the questions being addressed are:

First, can inhaled pollutants enter and/or affect the brain?

Next, what do laboratory animal studies tell us?

And finally, do we see these effects in exposed human populations?

--o0o--

DR. MIYASATO: Can ambient air pollution enter or affect the brain?

Usually, inhaled air enters the respiratory tract and travels into the lungs, but animal studies have also shown that inhaled ultrafine particles can pass directly from the nasal cavity into the olfactory nerve, thereby allowing direct passage into the brain.

Additionally, the brain is normally well protected by the cellular layer known as the blood brain barrier, which blocks entry of harmful substances from the blood stream. However, tiny particles, such as ultrafine PM, may pass through unobstructed. Also, as observed in

the Mexico City children, the blood brain barrier may be damaged, thus allowing substances to enter the brain. It is also likely that inhaled pollutant affect the brain via indirect pathways, stemming from air pollution effects triggered elsewhere in the body.

For example, adverse effects on the lungs could cause a release of chemicals into the bloodstream, which then affect the brain. In summary, research has shown that inhaled pollutants can enter the brain.

--o0o--

DR. MIYASATO: Next, I'd like to discuss evidence revealed by animal studies, most of which involved exposure to particulate matter or diesel particulates.

Numerous animal studies have provided evidence of brain inflammation, which is a potential mechanism by which pollutants exert adverse health effects. Inflammation is the body's normal response to harmful stimuli. It consists of a complex combination of cellular, chemical, and blood vessel responses that help neutralize potential threats, such as injury or infection.

However, if this response is prolonged, it can lead to cellular destruction or disease, including neurodegenerative disorders like Alzheimer's and Parkinson's disease.

Additionally, cognitive tests, such as how well

animals perform in mazes, reveal learning and memory impairments in response to pollutant exposures.

Other behaviors resembling human anxiety, depression, and impulsivity have also been demonstrated. Thus, animal studies demonstrate potential mechanisms leading to brain dysfunction as well as providing evidence of cognitive impairment.

--o0o--

DR. MIYASATO: Finally, what effects have been observed in human populations exposed to air pollution?

There have been a few studies on air pollution and dementia published in the past five years, but results were mixed. Recently, a study conducted in Ontario, Canada suggested a connection.

Over two million people were identified through the Canadian universal health coverage database. Their residential proximity to major roadways was determined by postal code. Age, sex, and pre-existing disease were taken into consideration. The results showed that the risk of dementia increased for people who live near busy roads with a seven percent increase for those closest to roadways compared to those living more than 300 meters from roads. No association was seen between residential proximity to roadways and Parkinson's Disease.

--o0o--

DR. MIYASATO: Another recent study conducted in the U.S. examined elderly women enrolled in the Women's Health Initiative Memory Study. This study looked at three-year average PM2.5 exposures between 1999 and 2010, and also looked at the women's genetic pre-disposition to develop dementia.

Results showed that the women exposed to PM2.5 levels above the annual national standard had an 81 percent increase in cognitive decline, and a 92 percent increase in dementia risk compared to women exposed to lower levels.

Additionally, cognitive decline and dementia risks were even greater for women with a high genetic predisposition for Alzheimer's disease. The authors suggest that a significant percentage of the population may be at risk of cognitive decline and dementia due to PM2.5 exposure.

--o0o--

DR. MIYASATO: I will now summarize the responses to our initial set of questions. First of all, yes, inhaled pollutants can enter the brain. Second, we've learned from animal studies that air pollutant exposures are associated with brain inflammation and cognitive impairment.

And finally, evidence is beginning to emerge that

suggests ambient pollutant exposures are linked with dementia in people.

Questions that remain to be answered include:

Which pollutants post the greatest risk?

What is the time frame over which exposures lead to adverse brain outcomes?

And finally, who is most at risk?

--o0o--

DR. MIYASATO: What is ARB doing to address the knowledge gaps?

One completed ARB contract looked at possible mechanisms of pollutant exposure. This study conducted by Professor Michael Kleinman at UC Irvine showed inflammatory changes in the brains of mice exposed to PM2.5.

Another study by Professor Arthur Cho at UCLA is examining ultrafine PM related changes in cellular mechanisms, brain pathology, and behavior in a mouse model of Parkinson's disease. We expect the results of this study in the coming year.

Additionally, an ARB contract with Professor Michael Kleeman at UC Davis is currently developing statewide estimates of ultrafine PM concentrations, which will be combined with epidemiologic data on premature death. Once this work is completed, there is the

potential to add on neurological outcomes, such as Alzheimer's disease or Parkinson's disease.

In other research, South Coast Air Quality Management District has supportive studies investigating air pollution's role in the formation of brain tumors.

--o0o--

DR. MIYASATO: The reason we continue to study air pollution's health impacts is because, as we've seen today, there is still more to learn and the impacts of exposure are more profound than we had thought. Even as researchers are working to better understand pollution's impacts, the State's programs are reducing exposures to particles. ARB's diesel regulations have contributed to decreasing ultrafine PM emissions.

As our mobile monitoring has shown for the I-710 freeway, ultrafine PM emission factors from heavy-duty trucks have decreased by about 70 percent between 2009 and 2016.

To continue that trend, we are strengthening ARB's field enforcement activities and using new screening technology for high-emitting vehicles, which you'll be hearing more about later in today's program.

ARB has just released a technical advisory titled, "Strategies to Reduce Air Pollution Exposures Near High-Volume Roadways", which is now available at the links

shown.

Finally, the long-term solution to ultrafine combustion pollution is the State's goal of electrification of transportation systems.

--o0o--

DR. MIYASATO: This concludes my presentation. Thank you for your attention. I would be happy to take any questions.

CHAIR NICHOLS: Questions, starting with Dr. Balmes. I was going to call on you anyway.

(Laughter.)

BOARD MEMBER BALMES: Well, it's not really a questions, but several comments. So I want to thank staff for this presentation. And they went over it with me in advance. And it's an important issue, given that as many of us are getting -- not getting younger, the issue of our -- of cognitive decline is certainly one that, you know, I take very seriously.

And the role of air pollution in neurodegenerative disease is really still unclear. The animal data are definitely suggestive, but the animals get exposed to a lot more ultrafines than most people would in these experimental studies. And, in fact, rodents are obligate nose breathers, so they actually get a bigger hit to the nose than we might. Certainly, when we're

exercising and we breathe through our mouth, we bypass the nose and rodents don't do that

The epidemiologic studies are in the right population, humans, but as we all know, it can be confounded by other factors. And again, one of the big issues is -- for these epidemiologic studies, it's not clear that it's really ultrafines that are the agent that is even being properly associated with the outcome.

I think those are a important study to be published, but they need to be followed up on. So I don't want everybody to run out and think that their brains are declining rapidly because they're breathing air along the roadway. But it is of concern. We need to follow it up. I think staff has appropriate -- Research Division has appropriate plans to follow up, as was mentioned. And I think stay tuned is the main message here.

So I don't want to be overly alarming, but we have to follow these leads up. And I think the Research Division is appropriately doing so.

CHAIR NICHOLS: Thank you, Dr. Balmes.

I was going to ask essentially that question. So I think you answered a question that I had. But I have another one, I guess. It's ARB's business, obviously, to look at air pollution and what it does to human health. But if you're talking about something that's as widespread

and of such great concern as any form of brain deterioration, obviously there are other causes, other links out there too. And I guess really my question is how can we appropriately, without minimizing or maximizing the importance of air pollution as a factor in this, understand what we're looking at in the context of what's known about the other causes, and how important a contributor this may be?

BOARD MEMBER BALMES: Well, that's, you know, a major challenge in terms of public health and epidemiologic studies of various risk factors.

Yesterday, there was a meeting by our sister agency the Office of Environmental Health Hazard Assessment on environmental justice in children. And it focused on the interactions between environmental hazards, and air pollution was one of those mentioned, and various other structural determinants of health related to poverty, access to health care, access to green space, et cetera, proper diet.

It's complex. And air pollution is rarely the sole cause of anything. It's -- in terms of health, it's interacting with other factors.

So we know that -- oh, that's actually -- thank you, Chair Nichols. An important point that staff didn't highlight was the Women's Health Initiative was done in

women of European ancestry. It's very typical. And the Canadians study was probably also mostly Caucasians. There's a lack of study of people of color. In general, in the U.S., it's actually been formally written about and there are efforts to change that. But it may be that people of color are actually more at risk for these effects than what these authors reported.

So, yeah, there's always --

CHAIR NICHOLS: Another factor --

BOARD MEMBER BALMES: -- difficulty attributing -- it -- there's actually an epidemiologic term, the Population Attributable Risk. And even for asthma, where we know a lot, you know, air pollution is only a part of the problem. There are always interactions with these other factors. And the more we learn about these interactions, the more we realize that often poverty is the single most important public health risk factor.

CHAIR NICHOLS: Yes. And that gets mentioned a lot. And then, of course, as an agency that makes policy decisions, we get caught up in arguments about whether the cost of whatever it is we're trying to do will, you know, cause more poverty or perpetuate poverty, and so forth. It's an argument that we can't escape though.

And I guess really the point in prolonging the conversation is just to say that I think we have an

obligation, even though we don't have all the resources we would like either to try to push the research in the direction of answering some of these questions, because we ultimately are faced with the mandate to make decisions that will affect many things, including how our economy works. And, in general, as the report indicated, anything that avoids combustion, anything that avoids creating particles is going to move in the direction of being helpful in terms of reducing exposure. And our programs are certainly tending in that direction. But on a regular kind of issue-by-issue basis, we still end up confronting some of those trade-offs.

BOARD MEMBER BALMES: And I would just end my comments by saying, because I feel that poverty is probably the most important public health hazard, even though I'm very much a supporter of environmental justice, I'm very much a supporter of improved actions with regard to public health and air pollution, climate change, I also want to see the economy continue to grow, because we need that for public health, too.

CHAIR NICHOLS: Ms. Mitchell, you had your hand up.

BOARD MEMBER MITCHELL: Thank you.

Excuse me.

I was wondering whether the National Institute of

Health has taken any interest in the subject matter, and if not, can we get them to be interested in this subject matter?

BOARD MEMBER BALMES: Yeah, they are interested in this issue. And actually one of my colleagues at Berkeley is planning on writing a grant to leverage our Fresno air pollution exposure data, which are very rich and initially supported by Air Resources Board to study this very issue.

BOARD MEMBER MITCHELL: Thank you.

BOARD MEMBER BALMES: Hopefully, the NIH will have enough budget to fund her.

CHAIR NICHOLS: Yes. Hopefully, they'll still exist.

(Laughter.)

CHAIR NICHOLS: Yes. Thank you.

Any other comments?

Okay. Seeing none. Let's move on then to the next agenda item, which is related. It's the consideration of the our proposed air pollution research agenda for the fiscal year 2017-2018, which is right around the corner.

Mr. Corey will present. But I just want to comment that the annual research plan, which we adopt, is then used to guide decisions about actual projects that we

will fund or co-fund. It's something that we use for a variety of different purposes, including response to legislative requests for information, development of implementation plans, and really to promote, in collaboration with other agencies that may have different bodies of research also to bring to bear on what we do.

So with that, I'll turn it back over to the staff.

EXECUTIVE OFFICER COREY: Thanks, Chair Nichols. And that's right, there are 20 projects in this year's research plan that staff is recommending for funding. The list of proposed projects was developed from a public solicitation of research ideas supplemented by extensive discussions with ARB program staff, staff from other State and federal agencies, as well as experts in these fields of study.

Staff also solicited input from the Board's legislatively mandated Research Screening Committee, which consists of 11 scientists, engineers, and others that are knowledgeable, technically qualified and experienced in air pollution and climate problems.

And if approved, the projects described in the research plan will be developed into full proposals and then brought back to the Board for your consideration and approval over the next several months.

I'll now ask Sarah Pittiglio of the Research Division to give the staff presentation.

Sarah.

(Thereupon an overhead presentation was presented as follows.)

MS. PITTIGLIO: Thank you, Mr. Corey. Good morning, Chair Nichols and members of the Board.

--o0o--

MS. PITTIGLIO: Today, we'll be asking the Board to approve the proposed fiscal year 2017-18 research plan. The budget is $4.2 million for funding 20 new research projects.

--o0o--

MS. PITTIGLIO: ARB's research program continues to play an important role in meeting the challenges of increasingly stringent federal air quality standards and long-term climate goals. The projects included in this research plan will help maintain ARB's scientific foundation, identify new emission reduction strategies, and monitor the progress of regulations that are already in place to ensure that programs are successfully implemented in all communities.

--o0o--

MS. PITTIGLIO: This diagram illustrates the ARB programs that the research program currently supports.

ARB's research initiatives on health and exposure, environmental justice, toxics, and economics provide comprehensive program support that informs the development of all ARB programs.

Research for specific ARB programs aims to inform efforts to reduce criteria and climate pollutants to mandated levels. Researching these areas aims to address long-term challenges, which compliments the work that ARB program staff due to address the agency's near-term issues.

--o0o--

MS. PITTIGLIO: ARB's Research Program was established by the legislature in 1971, and includes research through external contracts, as well as through in-house research initiatives. Continued coordination with State and federal agencies and other institutions enables the ARB to participate in projects and studies outside the reach of ARB's budget alone.

ARB's current portfolio of research projects leverage $5 of funding from our collaborators for every dollar spent by ARB's program.

--o0o--

MS. PITTIGLIO: To assist the Board in managing a sound research program, the legislature created the Research Screening Committee, or RSC, to oversee the

program. The RSC consists of scientists and engineers with experience in air pollution, health, climate, and environmental justice issues. The Committee meets approximately four times a year to review and provide formal approval of proposed and completed research projects.

--o0o--

MS. PITTIGLIO: The annual research planning process, begins with the collection of research concepts from an open public solicitation. Research concepts are then prioritized through internal and external coordination meetings. ARB coordinates with State and Federal agencies, local air districts, and research institutions in order to avoid duplication of effort, leverage funding, and identify opportunities for collaborative efforts.

ARB has also begun the process of identifying environmental justice community representatives to include in this coordination process, in order to better address the needs of these communities. ARB's highest research priorities are detailed in the annual research plan. If the plan is approved by the Board, projects are developed into contracts through a solicitation process. ARB receives input from external collaborators in the review process to select winning proposals, which are then

reviewed by the RSC.

Once a project is approved by the Board, work can begin. ARB staff managed projects and solicit input on a quarterly basis. Large or complex projects are assigned technical advisory panels for oversight. ARB -- or final reports are released to the public and available on our website after approval from the RSC.

--o0o--

MS. PITTIGLIO: This research plan proposes funding projects in ARB's key program areas. Funds will be used to address research needs related to health and exposure, environmental justice, toxics, mobile sources, State Implementation Plans, sustainable communities, and climate.

The remainder of the presentation will provide overviews of these major research themes, including descriptions of remaining research gaps and policy changes that have led to the need for the proposed research projects and for fiscal year 2017-18.

--o0o--

MS. PITTIGLIO: The health and exposure research portfolio investigates health effects from air pollution exposure, evaluates real-world exposures to pollutants, particularly among California's vulnerable populations, and identifies exposure mitigation strategies.

The research outlined in this plan will continue this direction and support the development of future air quality standards and regulations.

--o0o--

MS. PITTIGLIO: The health and exposure research program continues to address different exposures to harmful air contaminants as ARB control programs evolve. For example, regulations have resulted in meaningful decreases in combustion-related emissions from on-road vehicles, but emissions from brake and tire wear have remind relatively constant and are projected to become an increasingly larger portion of the on-road PM2.5 inventory in the future.

Understanding the health impact of exposure to these emissions is essential, especially since transportation plans project a larger percentage of the population living closer to major roads, thereby increasing exposure to re-suspended tire and brake wear particles.

--o0o--

MS. PITTIGLIO: This first study for health and exposure will examine the health impacts of different types of particles emitted from tire and brake wear in various Los Angeles locations.

The second project will use samples collected

from a previous study that determine if simultaneous exposure to PM2.5 and ozone results in a greater adverse cardiac health effect compared to either pollutant alone. These studies will help inform the implementation of SB 375 initiatives, and regulations that aim to reduce exposure to harmful traffic-related emissions.

--o0o--

MS. PITTIGLIO: ARB's Environmental Justice Research Program is focused on identifying regions where there is disproportionate exposure in the State, and developing mitigation strategies to reduce exposure to harmful pollutants in these communities.

Findings from previous in-house and contracted work on these topics have helped to inform policy decisions on motor vehicle emissions control, enforcement an incentive funding distribution and low socioeconomic status populations.

--o0o--

MS. PITTIGLIO: Long-term monitoring data and environmental justice, or EJ communities, and non-EJ communities have shown that ambient concentrations of some pollutants, such as diesel PM are dropping, and that the greatest reductions of these pollutants have been seen in EJ communities.

However, for some pollutants such as PM2.5, while

levels have dropped in both EJ and non-EJ communities, concentrations continue to be higher in EJ communities. Additional research is needed to identify the sources contributing to this remaining disparity.

Another challenge is assessing exposure risks -- in assessing exposure risk is that while technologies to monitor for criteria pollutants are currently available, commercial technologies are not available for monitoring toxic metals in real time.

--o0o--

MS. PITTIGLIO: In response to these challenges, the first project will develop a methodology to more accurately characterize exposure to PM2.5 sources in California. This, too, will help prioritize sources contributing to higher concentrations in EJ communities.

The second project will conduct a statewide survey of air toxics concentrations in disadvantaged communities with the highest in CalEnviroScreen scores.

The third project will examine the efficacy of various portable technologies to measure ambient concentrations of toxics metals in real-time. The objectives of these first three projects overlap with the interest of the air districts and other research entities. ARB staff is collaborating with these organizations to ensure that concurrent efforts are not duplicated and to

seek co-funding opportunities.

Near-term exposure mitigation strategies are being addressed by ARB funded demonstration projects. The last project will compliment these efforts by evaluating a promising long-term strategy to mitigate exposure to traffic-related pollutants in vulnerable urban areas. This will be addressed by determining the potential for virtual geospatial fences to trigger heavy-duty vehicles to reduce diesel PM emissions, when they enter these urban areas.

--o0o--

MS. PITTIGLIO: The mobile sources research program on vehicles and fuels supports forward-thinking projects that address the agency's long-term needs related to updating emission inventories and developing, implementing, and tracking the progress of regulations and incentive programs that reduce transportation-related emissions.

The proposed projects aims to address remaining challenges associated with regulation compliance and improving emission inventory data.

These challenges include the disparity between real-world emissions, and those measured during certification, and insufficient data to track the long-term effects of the low emission vehicle regulation

and reducing exhaust emissions.

Testing has also confirmed that cold-start emissions during plug-in hybrid drive cycles can be significantly higher than emissions from traditional engine cold starts.

--o0o--

MS. PITTIGLIO: The first mobile sources project will characterize the activity profiles for heavy-duty off-road diesel vehicles and engines used for construction.

The second project will characterize the activity profiles of cold start emissions produced by blended plug-in hybrid vehicles in order to understand the real-world scale of the increasing emission profiles previously measured in the lab.

The third project will investigate non-tailpipe emission factors from light- and heavy-duty vehicles in order to update the emission inventory.

The fourth project will leverage an existing data set of over ten million emission measurements from five states to identify specific vehicle makes and models that have higher than expected on-road emission rates.

The fifth project will continue a series of criteria pollutant measurement campaigns in West Los Angeles using remote sensing devices. Together, these

projects will improve the emission inventory and form compliance efforts, track program effectiveness, assess disproportionate exposure in disadvantaged communities and guide future regulation development.

--o0o--

MS. PITTIGLIO: ARB's air quality research portfolio continues to improve the scientific foundation that supports the development of State Implementation Plans, or SIPs, for meeting national ambient air quality standards. Results from research in this program area have improved emission inventories, our understanding of chemical actions in the atmosphere, and has led to the development of improved air quality models that provide the technical foundation for California's SIPs.

--o0o--

MS. PITTIGLIO: As regional ozone concentrations decrease due to emission controls, background ozone is becoming a larger fraction of ozone in the ambient air. Understanding the variability in concentrations of baseline ozone is critical for attainment of future ozone standards. Collaborations with NASA have allowed ARB to leverage data collected from a variety of aircraft and surface measurements. However, additional analysis of the flight data is needed to understand ozone transport across the Pacific Ocean.

Although the air quality in the San Joaquin Valley has improved in recent years, the area still exceeds the federal standards. Conditions that have led to recent PM2.5 exceedance events need to be better understood to attain future PM2.5 standards.

--o0o--

MS. PITTIGLIO: The first project will analyze aerial ozone measurements collected by NASA during a previous study.

The second project will acquire and deploy monitor in the San Joaquin Valley to collect a data set that will allow research -- researchers to identify sources and chemical pathways that lead to PM2.5 formation.

Results from these projects will inform policies addressing ozone and PM2.5 attainment in the San Joaquin Valley.

--o0o--

MS. PITTIGLIO: Sustainable communities are neighborhoods with equitable and affordable transportation choices and housing options, and access to quality employment, education, and other services.

ARB's sustainable communities research program supports the implementation of Senate Bill 385 and helps pave the way for the 2050 climate goal. This year's

projects address multiple challenges associated with SB 375 implementation, including the need to identify and model the potential health impacts of active travel.

Accounting for GHG reductions in the building sector should include reductions from associated waste, water, and transportation, in addition to energy savings. The impacts of advanced technologies, such as connected and automated vehicles, on vehicle -- vehicle mile traveled, and associated emissions, also needs to be evaluated to inform policies that will ensure emission reductions.

--o0o--

MS. PITTIGLIO: The first project will create an accessible updated version of a model to help policymakers and planners calculate the health impacts of transportation related GHG reduction strategies that incorporate active transportation, such as walking and biking.

The second project will leverage an existing zero net energy community project in Richmond to create an accounting framework for zero net carbon communities.

The third project will quantify the projected impacts of varying penetration levels of light-duty connected and automated vehicles on GHG and criteria pollutant emissions, and vehicle miles traveled.

Results from these projects are designed to assist policymakers and local governments in their efforts to reduce GHG emissions while minimizing unintended adverse impacts on health and social equity.

--o0o--

MS. PITTIGLIO: The proposed climate-related research projects respond to several key challenges including Senate Bill 1383, which requires ARB to reduce emissions of methane and f-gases by 40 percent below 2013 levels by 2030.

Dairies are a significant source of methane and criteria pollutants, but quantifying dairy emissions can be challenging due to the inherent complexity of these systems.

ARB has a good inventory of large stationary refrigeration equipment, but facilities using small refrigeration systems are not required to register with ARB's Refrigerant Management Program. In order to reduce emissions from small refrigeration systems, the number and types of equipment are needed to assess and mitigate their overall GHG impact.

Light-absorbing organic carbon that is not black is referred to as brown carbon, which was recently discovered to be a potentially large contributor to global warming. The relative contribution of each source of

brown carbon, and its impact on climate forcing, still needs to be assessed.

--o0o--

MS. PITTIGLIO: The first climate-related project will investigate mitigation strategies from dairy sources for multiple pollutants, including methane, nitrous oxide, ammonia, and volatile organic compounds.

The second project will determine the economic and logistical feasibility of a variety of strategies to inhibit methane production from enteric and lagoon sources in California's dairy operations.

The third project will improve the F-gas emission inventory from small commercial and industrial stationary refrigeration systems. The project will also determine the costs and energy efficiency associated with using low-GWP alternative refrigerants in these systems.

The fourth project will provide supplemental funding to an existing project to further assess the net contribution of brown carbon to California's climate.

--o0o--

MS. PITTIGLIO: ARB staff disseminate new research results through multiple mechanisms. Public seminars provide opportunities for the public to join in-depth discussions on the implications of research results and identify remaining research gaps.

ARB also presents research results to the public at Board meetings. Upcoming items include a Board presentation on methane super-emitters this fall.

For more information on ARB's research program, please visit our website. You can also join our listserve to receive notifications when new reports are released, and when calls for public research concepts and project proposals are announced.

--o0o--

MS. PITTIGLIO: If the 2017-18 research plan is approved today, staff will work with our research partners to develop full proposals. We will then return to the Board to request approval and funding for each project. We recommend that you approve the fiscal year 2017-18 annual research plan.

Thank you.

CHAIR NICHOLS: Thank you.

We do have two people who've asked to comment on this. So why don't we hear from them. First from W. Glover. I think both microphones are working or only one today. Yeah, both are. Okay great.

MR. GLOVER: Morning. My name is William. And I'm local community activist. I wanted to -- I wanted to talk to you to see if you might consider a recommendation for opening the research process from -- to additional

groups to get maximum feedback, additional money and resources for partners like neighborhood groups, environmental planning groups, local NGOs and Native American tribes.

Neighborhood groups seldom see money for air resources, air quality research. So that's one of the places where bad air quality is most impacted, most affects people's health. Native American tribes are always in need of more resources.

So that's all I have. Thank you.

CHAIR NICHOLS: Thank you. Brian Shobe.

MR. SHOBE: Yes. Thank you. And good morning, members of the Board and ARB staff. I'm Brian Shobe, and I'm with the California Climate and Agriculture Network CalCAN. We're a coalition of the State's leading sustainable and organic agriculture organizations. We just wanted to speak in support of the proposed research on multiple pollutant mitigation strategies from dairies sources.

We work with small and mid-scale dairy producers for whom digesters are impractical for both a financial and feedstock perspective, and simply do not produce enough waste to maintain the digester. And therefore, we support the State's move towards a more diversified strategy to achieve dairy methane and other air pollutant

reductions.

To date, there has been very little State research in investment in these alternative manure management practices, and so we believe the ARB funding proposal is a move in the right direction.

I also wanted to speak briefly to the proposed investments in the Sustainable Communities Strategies. The administration, through its work with the Strategic Growth Council has acknowledged the importance of preserving agricultural farmland at risk of sprawl and rural ranchette development.

So to meet our climate change goals, the Sustainable Agricultural Lands Conservation Program, or SALC, was established in 2010 to fund ag land conservation and complement our urban in fill efforts to reduce sprawl.

However, nothing in the proposed research plan speaks to this green-side of the Sustainable Communities Strategies. So we'd like to see more research that supports the policy, planning, and program frameworks that improve our understanding at the local and regional level of how best to support farmland conservation that complements the urban side of our Sustainable Communities Strategies, in order to reduce vehicle miles traveled.

Wrapping up. We know that an acre of urban land emits 70 times more greenhouse gas emissions than an acre

of irrigated cropland. And bearing that in mind, we believe more can be done to improve our understanding at the local and regional level and support farmland conservation.

Thank you.

CHAIR NICHOLS: Thank you.

Appreciate your attention to the research plan.

I think we could have a motion to approve.

BOARD MEMBER BALMES: I would make that motion --

BOARD MEMBER RIORDAN: I would second.

BOARD MEMBER BALMES: -- but I think -- I may be conflicted because the University of California gets a lot of --

CHAIR NICHOLS: Oh. Yes, in the past, our Board members who are employed by institutions that do research have just abstained on this item.

BOARD MEMBER EISENHUT: I'll move it.

CHAIR NICHOLS: All right. Mr. Eisenhut will make the motion then.

BOARD MEMBER MITCHELL: I'll second.

CHAIR NICHOLS: Second. Second from Ms. Mitchell.

CHAIR NICHOLS: All those in favor, please say aye?

(Unanimous aye vote.)

(Dr. Balmes abstaining.)

CHAIR NICHOLS: Any opposed?

And abstaining Would be John Balmes. And that would be it. Okay. Thanks so much.

All right. Let's then move on. This is a meaty plan. I keep thinking that we should be looking to enhance our research budget, especially now when others are falling by the wayside. It's late in the year, but I'd urge some thought to that, whether there's a way we can do something on that.

Next agenda item is proposed revisions to the Carl Moyer incentives program. The Moyer Program complements the Board's regulatory programs by providing financial support for vehicle and equipment owners to voluntarily purchase engines and technologies that are cleaner than required or to do so earlier than regulatory requirements would kick in.

The Moyer Program was the first of the Air Board's incentive programs dating back to 1998, which seems like ancient times. But back in those days --

BOARD MEMBER RIORDAN: I remember it well.

CHAIR NICHOLS: -- people used to argue about whether it was okay to give financial incentives to comply with regulations or whether we should be pure and just insist the people comply without support. I think those

arguments are long behind us now.

To date, the program has provided more than $900 million in funding to replace over 50,000 engines, which has reduced ozone precursor emissions by about 178,000 tons and particulate matter emissions by about 6,500 tons.

The program is implemented in close partnership with California's air districts who select the projects that have delivered those results.

Mr. Corey, would please introduce this item?

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair. And you're right in terms of the impact of the program. It's just been tremendous in terms of reductions.

But as you stated, the Carl Moyer Program is very successful providing cost effective emission reductions through financial assistance to replace, repower, and retrofit old highly polluting engines. While the regulations continue to be the primary means to reduce air pollution in California, accelerating fleet turnover through the Moyer Program provides reductions that are beyond what has been required by regulation.

Looking ahead, incentives will play an increasingly important role in meeting California's strategic air quality objectives, particularly for the State Implementation Plan and for the advancement of zero and near zero emission technologies.

The revisions being proposed today are in response to SB 513 authored by Senator Beall and signed by the Governor in late 2015. SB 513 gave California's air quality agencies significant new opportunities, including the ability to modify cost effectiveness limits, to reflect technology and regulatory costs, and the ability to co-fund projects with other programs.

Such projects may also now include infrastructure. SB 513 directed the Board to update the Moyer guidelines before July 1 of this year.

In preparing the guideline update, we worked in close cooperation with the air districts and with input of industry, environmental organizations, and members of the public during the five workshops. The Moyer Program implementation is a joint effort by ARB and our district partners. Therefore, Alan Abbs of the California Air Pollution Control Officers Association will say a few words after staff's presentation.

I'll now introduce Neva Lowery from the Mobile Source Control Division to give the staff presentation.

Neva.

(Thereupon an overhead presentation was presented as follows.).

AIR POLLUTION SPECIALIST LOWERY: Thank you, Mr. Corey. And good morning, Chair Nichols, and members of

the Board. Today, I will present an overview of the Carl Moyer Program and staff's proposed revisions to the program guidelines.

The Carl Moyer Program is named in honor of the late Dr. Carl Moyer, who would have celebrated his 80th birthday this year. Dr. Moyer was a pioneer for incentive programs. Many CARB and air district staff have fond memories of working with Dr. Moyer and recall his passion, his extraordinary dedication to air quality and his vision for using financial incentives to get emission reductions beyond those achieved by regulations.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: The Carl Moyer Program was the first program in California to use incentives to reduce emissions on a large scale starting almost 20 years ago. The program complements existing regulations by focusing funds towards earlier extra emission reductions. The Moyer Program has periodically been refreshed to keep pace with policy, regulatory, and technology changes.

For example, Moyer was the first -- was at the vanguard of ensuring that incentive programs contribute to environmental justice. Similarly, the program was early to recognize the need to focus on fine particulate matter reductions, developing a weighting factor for PM emissions

to better address the toxicity of diesel particulate matter.

Today, the program continue -- contributes -- continues to provide emission reductions that can be credited in the State Implementation Plan as it approaches its one billionth dollar spent on clean air projects.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: One of the key elements to the Moyer Program success is the partnership between CARB and the local air districts in implementing the program. At its core, the Moyer Program is a statewide, locally-directed program that provides public funds to reduce air pollution. This basic structure allows the Moyer Program to support both local priorities and statewide goals.

While CARB is responsible for the overall program guidance and oversight, the air districts lead the program at the local level. They conduct local outreach, select projects that serve their community needs, and make sure that those projects are performing as intended.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: The cornerstone of the Carl Moyer Program is cost effectiveness. Under statute, Moyer projects are evaluated in dollars per ton of emission reduced. This requirement helps Californians

receive greater public health benefit for their investment, and also provides a mechanism for quantifying surplus emission reductions for the SIP.

As noted, the air district makes the decision to enable the program to serve their local needs, such as environmental justice, and selects projects that make the most sense for their communities.

Agricultural pumps and tractors are high priorities for the San Joaquin Valley, for example, while heavy-duty trucks and construction equipment become more important in the South Coast. Air districts report regularly on implementation. And since 2008, we've had in place a database to track projects to further ensure accountability.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Those dollars come from several sources. About two-thirds of Moyer is funded through the smog abatement fee collected by DMV at $6 per year for the first six years of the vehicle life, in lieu of smog check. About one-third of Moyer comes from a $0.75 fee on the sale of new tires. While smog abatement free has no sunset date, the tire fees are due to sunset after 2023.

The statewide program is currently authorized at $69 million annually. Moyer Program funds are allocated

to California's 35 air districts through a statutory formula that considers air pollution severity and population. In addition, air districts that take more than the minimum allocation must provide a 15 percent match. This adds about $8 million to the program each year, typically funded through a local $2 DMV fee.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Overall, since 1998, over $900 million have been used to clean up 50,000 old dirty engines. This has reduced over 178,000 tons of NOx and ROG, and 6,500 tons of particulate matter. The Moyer Program has provided significant public health benefit over the past 19 years, as well as providing economic benefit to fleets, technology providers, and distributors. It's an ideal nexus.

Moyer encourages customers to purchase cleaner technologies that improve air quality while also signaling the marketplace to manufacture and distribute cleaner technologies.

AIR POLLUTION SPECIALIST LOWERY: While once alone, the Carl Moyer Program has become part of a successful portfolio of air quality incentive programs across the nation, as well as in California.

Collectively, these programs have become essential tools for air pollution reductions. Within

California, these programs work together to provide vital support to meet our commitments to air quality plans, such as the SIP, the scoping plan, the Sustainable Freight Action Plan, the Zero Emission Vehicle Action Plan, and the Short-Lived Climate Pollutant Reduction Strategy.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: This diagram illustrates how various incentive programs work together in California. Programs such as the Air Quality Incentive Program fund demonstration projects to establish the feasibility and performance of new technologies. Once a cleaner technology is certified and commercially available, the Moyer Program serves to accelerate deployment and fleet penetration and to gain market acceptance.

Because the Moyer Program is based on cost effectiveness, it works best when a technology has matured and costs started to come down. Moyer Program funds can also help fill in gaps in this pathway, so that incentives work alongside regulations to move technologies into and throughout the marketplace, and more fleets turnover to cleaner technologies sooner. Moyer can serve this role for a wide variety of project types.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: I mentioned

earlier that local air districts select Moyer projects according to local priorities. Thus, the program supports a variety of project types, including on-road heavy-duty vehicles, locomotives, marine vessels, off-road projects such as construction and agricultural equipment replacement, as well as light-duty vehicle retirement.

This chart shows how Moyer funds have been spent by source category. Since we do not report to the Board annually, we'd like to take -- we'd like to take this opportunity to provide a little more background about the success the air districts have achieved in implementing the Moyer Program.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: About one-fifth of Moyer Program funds have been directed to on-road heavy-duty vehicle projects. These include the replacement and repower of trucks, transit vehicles, school buses, logging trucks, and emergency vehicles. Here, we see the location of these projects as dots on the map of California.

Over the life of the Moyer Program, more than 7,000 on-road heavy-duty vehicles have been replaced, repowered, or retrofitted. These include over 1,700 replacements through the voucher incentive program in support of small fleets and over 150 log trucks replaced

in support of more agricultural fleets.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: The off-road category covers a wide range of equipment types, including agricultural equipment, construction equipment, stationary and portable equipment, and a variety of other off-road applications.

To date, nearly half of Carl Moyer Program funds have been used to replace or repower off-road engines. In the beginning of the program, a significant amount of these funds went towards repowering agricultural pumps to cleaner engines and even to electric. In recent years, more funds have been used to repower or replace agricultural tractors and construction equipment.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Marine vessels that have received funding include fishing boats, harbor craft, and ferries. Ocean-going vessels also benefit from shore-power projects. Eligible locomotives include those providing line-haul, switcher, and passenger service.

To date, the Carl Moyer Program has funded nearly 2,000 marine engine upgrades and over 200 locomotive engines. Although these projects tend to be expensive, they are critical to reducing toxic air pollution in environmental justice areas surrounding ports and

railyards.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Environmental justice is a very important component of the Moyer Program. The Moyer Program was the first incentive program to focus public incentive funds to improve air quality in disproportionately impacted and vulnerable communities.

In 2001, Assembly Bill 1390 directed that air districts with one million or more residents devote at least 50 percent of Moyer Program funds to directly reduce air toxic and other air contaminants affecting minority and low-income populations.

The five largest air districts in the State, shown here, consider disproportionately impacted areas as they prioritize funding and select projects. To date, we estimate that more than $344 million of Moyer funds have been directed to environmental justice communities, funding more than 19,000 projects that have reduced NOx and ROG missions by 68,000 tons and PM by 2,500.

Environmental justice will continue to be a priority for Moyer funds and an important element of program implementation.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: To this point

in the presentation, I have discussed the history of the Carl Moyer Program and the guiding principles that have made it a success. Now, I will take a look forward at the areas where staff proposed program improvements to ensure that the program continues to help meet California's air quality challenges in the future.

Since the Moyer Program began, the regulatory and technology landscape has changed significantly. To meet California's air quality and clean mobility objectives, engines must transition to the cleanest emission alternatives. Moyer and other public incentive funds are an increasingly important part of that transition.

We must remain accountable for the public dollars and true to our commitment to SIP creditability, but we also -- but also avoid adding the complexity that often comes with additional technology options. We want to improve the manageability of the program for air districts and its transparency for the public and small businesses who benefit from it.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Senate Bill 513 authored by Senator Beall, and signed by the Governor in October 2015 provides the opportunity to update the Moyer Program to meet those future needs. SB 513 marked a fundamental change, because it enables the Board, in

collaboration with the air districts, to set new cost effectiveness limits.

The bill also allowed us to increase the cost effectiveness limit for school bus projects to provide meaningful Moyer funding for the first time.

Senate Bill 513 also expanded the program's ability to support infrastructure projects that enable emerging technologies. And it allowed for Moyer funds to be leveraged with those -- of other incentive programs without adding the other funds to the cost effectiveness calculation.

The changes made through SB 513 were supported and informed by a coalition of stakeholders that included air districts, environmental organizations, industry stakeholders, equipment dealers, and consumers. We would like to specifically thank Vice Chair Berg and her leadership of the Incentive Programs Advisory Group, which was invaluable in developing that coalition.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: The revisions proposed here today were developed through extensive outreach and collaboration with those same stakeholders. CARB and the district staff formed a tactical team to develop guidelines that would continue the Moyer core principles, but also expand the program to take advantage

of the new opportunities.

Because rural air districts often have different and unique challenges, we also focused our efforts to ensure that new guidelines would serve small districts. The result we believe is a solid consensus of improvements essential to continuing program value.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: The first of those improvements is the establishment of cost effectiveness limits. Under statute, all projects, except for infrastructure, must meet cost effectiveness limits. That means that the amount of money a project can receive is limited by the emission reductions it provides. The original cost effectiveness limit was set in 1998 at $12,000 per ton. It has been updated only to account for inflation since then, bringing it to about $18,000 per ton today.

You will recall that SB 513 provides for a separate limit for school buses, to be consistent with the Lower Emission School Bus Program. That limit of $276,000 per ton took effect in January 2016.

Several air districts have already been -- have already taken advantage of this change to fund cleaner buses. The first new school bus project under Moyer was delivered this past January in Tuolumne County.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Senate Bill 513 directed that the cost of technology and the cost of State and local regulations be considered by the Board in establishing new limits for all types of projects.

Although there remain very cost-effective projects and districts will continue to pursue them, after almost 20 years, most of the low-hanging fruit is gone. Based on our review of more recent regulations, staff proposed to increase the base cost effectiveness limit to $30,000 per weighted ton of emission reductions. This will enable more meaningful grants for cleaner engines to meet the required standard early.

The bulk of Moyer projects will continue to rely on cleaner conventional projects to meet required standards sooner than required by regulations. However, that level isn't sufficient for advanced technology projects, such as those zero-emission and near-zero projects called for in the SIP. For these projects, staff proposes to give air districts the option to apply a cost effectiveness limit of up to $100,000 per ton. The higher cost effectiveness value would be allowed only for the increment of emission reductions beyond those achieved to the required standard.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: This on-road heavy-duty example illustrates how the two-step approach would be applied. The air district will apply the base cost effectiveness limit of $30,000 per ton to the reductions that would be achieved by an engine meeting the required 0.2 gram per brake horsepower hour standard.

For step 2, as long as the replacement is zero emission, or in this case certified to the cleanest optional standard of 0.02 grams, an air district could choose to apply the higher limit of $100,000 per weighted ton of emission reductions beyond the required standard.

This two-step approach allows the Carl Moyer Program to fill dual functions: one, to continue to support the most cost-effective conventional projects that achieve early reductions, and two, to provide the additional incentive needed to turn over engines and fleets to the cleanest certified technologies now emerging in the marketplace.

It is important to note that air districts have the option to apply the higher limit, and also have the discretion to be more stringent in the guidelines.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Advancement of clean air technology requires sufficient infrastructure. And fortunately, SB 513 expanded the Moyer Program's

ability to support infrastructure projects. Proposed new categories include solar-power agricultural pumps, natural gas and hydrogen fueling stations, and electric vehicle charging stations.

The charging stations are drawing particular interest, and we propose funding allowed for publicly-accessible stations or for private stations for fleets. Residential charging stations would also be considered for multi-family dwellings and low-income consumers -- customers.

To provide transparency, staff proposes to require a competitive bid process when the project includes public access. To further the prudent use of funds, we propose that Moyer be limited to 50 percent of the infrastructure project's eligible cost, with some additional funding for projects with public access or using renewable power. However, charging and alternative fueling infrastructure for school buses would be eligible for 100 percent funding through Moyer.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: The third key change from SB 513 provides co-funding opportunities to expand the reach of the Moyer Program. The bill included requirements to prevent project overpayment or the double counting of emission reductions. Our proposal reflects

these safeguards and also ensures SIP creditability for emission reductions.

This new flexibility has the potential to open doors for public-private partnerships and greater co-funding among incentive programs. Staff proposed that public projects be allowed to leverage 100 percent of the project costs, while private applicants would be required to provide a 15 percent cost share.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Together, these changes allow Moyer the flexibility to fill multiple roles, and to fill-in where the need is greatest. We will walk through a hypothetical transit fleet that is switching to hydrogen fuel cell, but the example could apply to electric or natural gas fueling, as well as other equipment types.

First, Moyer would be able to contribute towards the capital cost of replacing the existing fleet of buses or to repower them. While both Moyer and the California Energy Commission fund could support publicly-accessible hydrogen stations, Moyer could also fill a gap for the dedicated fueling capacity needed for transit fleets.

Additionally, Moyer could co-fund projects with other incentive programs for instance, and serve as match for Federal Transit Administration funds for bus

purchases.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: In addition to the major changes dictated by Senate Bill 513, we're taking the opportunity to update and streamline the other aspects of the Moyer Program. I will quickly run through these changes that have been developed and vetted with the -- with air districts and other stakeholders.

For on-road, we're proposing to increase voucher funding amounts for small fleets of ten vehicles or less to further encourage their participation. We're also proposing to increase maximum grant amounts for new technologies to better reflect their incremental costs. For this reason, we have determined that we need to make further modifications to ensure we cover the incremental costs of projects like refuse truck repowers to the 0.02 gram standard, among more minor, non-substantive corrections. Your approval today enables these changes.

And while we will continue to prioritize small fleets, we are proposing to open up funding to large fleets that purchase zero or near-zero technologies. The South Coast Air District has already expressed an interest in using these changes to deploy a large number of optional low-NOx 0.02 gram natural gas engines relatively quickly.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Regarding on-road projects, there have been some questions over the impact the recent transportation bill will have on the Carl Moyer Program's ability to fund trucks. Staff is glad to report that SB 1 is fully compatible with the Moyer Program objectives.

While SB 1 does -- does limit any future in-use fleet regulations from requiring a placement or retrofit before the truck is 13 years old, or has accumulated 800,000 miles, it does not restrict participation in voluntary incentive programs like Moyer.

In addition, SB 1 provides a mechanism by which non-compliant trucks can be denied registration. This will help ensure that those trucks who have acted in good faith to comply with the Truck and Bus Rule are not placed at a competitive disadvantage.

Nothing in SB 1 was restricts incentive funding, and the provisions do not limit our ability to support the truck -- those truck owners who comply early and provide surplus emission reductions, nor does SB 1 prevent us from incentivizing the purchase of cleaner trucks that go beyond the Truck and Bus Rule.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: For off-road

equipment, the proposal will increase project opportunities and open program -- the program to fleets that may not have previously participated.

The widespread availability of Tier 4 final engines was slower than expected. Therefore, we propose to offer one additional opportunity for large fleets to receive funding for Tier 4 engines. A large fleet would be eligible to receive funding through 2019.

To ensure continued opportunities for medium and small fleets, large fleets would only get one additional bite at the apple. For the off-road requirement replacement program, staff proposes to further expand the program by allowing baseline Tier 3 and portable equipment to be eligible, as long as there are surplus emission reductions.

For portable engines, the Board is scheduled to hear proposed amendments to the Portable Air Toxic Control Measure at the upcoming hearing in the fall. It is possible that the Board may approve changes to the ATCM that would open up additional surplus opportunities for the Moyer Program.

If that is the case, staff proposes to use the authority delegated to the Executive Officer to make any changes necessary to allow funding opportunities for additional eligible projects.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: Finally, the program will continue to support all the other source categories currently available with some relatively minor changes. For both marine and locomotive categories, staff propose improvements to the eligibility requirements to encourage the public -- purchase of the cleanest available technologies.

Relative to locomotive projects, staff proposed to allow the reuse or recycle of the chassis while still requiring the old engine be destroyed. Other categories will remain with even more minor changes. Staff also proposed updating emission estimates to reflect improvements in the emission inventory. Those changes will improve Moyer's ability to support the SIP.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: We also want to highlight the greater importance placed on the Moyer Program and other incentive measures in the SIP. Incentive measures include the South Coast heavy-duty vehicle incentive measure adopted last month and in the San Joaquin Valley PM2.[sic] strategy under consideration this fall will play a key role in achieving required reductions by 2023, and providing a path to SIP credit for further deployment of new technologies by 2031.

Staff will continue to work closely with U.S. EPA to establish a framework for SIP credit from Moyer and other incentive programs.

--o0o--

AIR POLLUTION SPECIALIST LOWERY: To summarize, staff's proposal is a culmination of a multi-year effort with air districts and with other joint stakeholders to modernize the Moyer Program. The proposal will continue to support current projects while setting the stage for advanced technology projects that California needs to meet its clean air goals.

Approval of the proposal will enable the Moyer Program to help with our State's transformation to zero and near-zero technologies of the future.

Staff recommends the Board approve the proposed Carl Moyer Program 2017 guidelines. With the support of the Board, CARB staff -- CARB staff will continue to partner with air districts and others to update the program as needed to ensure its continued success.

That concludes this presentation. At this point, we would like to invite Alan Abbs, Executive Director of the California Air Pollution Control Officers Association to make a few remarks.

CHAIR NICHOLS: Good morning.

CAPCOA EXECUTIVE DIRECTOR ABBS: Good morning,

Chair Nichols and members of the Board. My name is Alan Abbs. I'm the Executive Director from the California Air Pollution Control Officers Association representing the executive officers from the 35 air districts.

And first off, I want to say I was -- I was happy -- really happy half way through the presentation when they mentioned the work done by Vice Chair Berg to kick off this process. At the beginning of the presentation, I was like what about Vice Chair Berg?

(Laughter.)

CAPCOA EXECUTIVE DIRECTOR ABBS: You know, she started that IPAG process and that kicked off this entire thing. But I'm glad that she got the recognition that she deserves. She did an excellent job rounding us all up to identify the issues, and it got us -- got us to where we are today. So thank you Vice Chair Berg for the work that you did.

AB 8 and SB 513 were pretty a long process. We got through it three or four years. We got the Carl Moyer Program re-authorized for another ten-year period using the same fee structure that was previously there, including air districts being able to provide matching funds through the 923 program. And then SB 513 from Senator Beall codified some of the changes that came out of the AB 8 process, and then directed ARB staff to work

with the air districts to update the guidelines.

And CAPCOA is in support of the guidelines today, and the work that's gone into making this possible. And thanks to staff for all the work that they've done to get to this point.

One thing that we -- that we found out, or I think we knew this, but during the AB 8 and SB 513 process, was that Carl Moyer is a -- is a very popular program at all levels of the State, at the legislature, among our environmental stakeholders, among our industry stakeholders, all the way down to the local elected official level. You'd find it very hard to locate someone that isn't a big supporter of the Carl Moyer Program, and being able to get emission reductions through a local decision-making process, and to identify the types of emissions that are important at the local level to go after and get reduced cost effectively.

And so it's -- so it's great that -- that we're continuing this work with ARB to make changes to the program and make it even better for the next ten-year period.

The -- getting back to the changes that have been proposed. The change in the cost-effectiveness calculation is really important to continue to make this program a success. And during the AB 8 and 513 and IPAG

process, we realized that with the changes in technologies that were coming, the costs associated with those technologies, and the -- and just doing some simple math, that the way we were figuring out cost effectiveness is for projects that we're going to be able to get funded or not get funded was going to be an issue. And so I'm glad that we've come up with a cost effectiveness limit that's going to identify emerging technologies and appropriately allow them to be funded.

Fred Minassian from the South Coast is going to be following up right behind me. I'm very -- I'm positive that he's going to talk about the need to get down to 0.02, and zero, and electrified transport to meet South Coast goals. And so -- so the cost effectiveness and then the kicker for the additional cost effectiveness is going to be very important for places like South Coast to meet their clean air goals.

The leveraging is also very important. We appreciate the work that's -- that came about to make sure that air districts will be able to leverage public and private funds to increase the number of projects, and also the infrastructure for electrification and hydrogen and natural is going to be important too.

You will hear some comments from Dave Johnston from El Dorado Air Pollution Control District about some

changes he'd -- he thinks would be appropriate for further assistance for electrification. And I encourage the Board to hear what he has to say and to think about some of his concerns.

But with that, I'll just finish it off and say thanks again to staff for the work that's gone into this. We look forward to continuing the Moyer Program until 2024, which is a -- when it's good for right now, and we look forward to working with ARB staff to make -- continue to make it a success.

Thanks.

CHAIR NICHOLS: Thank you very much.

Well, you kind of spoiled my surprise. I was planning to call on Vice Chair Berg after the testimony, but I think maybe I should ask her if she'd like to speak at the outset as to how we got to this point.

VICE CHAIR BERG: Thank you, Chair Nichols.

This has been an area that has been near and dear to my heart as I've worked very closely, not only with our very capable staff, but also the APOs. And just can't tell you how thrilled I am today that not only the effort that went in to accomplish the legislation, but also to me what is really key is the relationship between ARB and the District.

And, Alan, please express my sincere gratitude

and my thanks for all the efforts that you and the districts have put forth in making this relationship not only so strong with our staff, but also driving forward this changes, so that the future of these programs is really alive and well.

And I can't thank staff enough. I kind of feel like I'm resting a little bit on my laurels to be frank with you, because it really has been staff, and the districts that have been carrying the water and doing a great job. As I went through my briefing yesterday, and were asking many questions that used to come up, they were just all resolved and great work between both agencies and the stakeholders that benefit from this. And so really I offer my hearty congratulations. Just a great, great job. Thank you very much.

CHAIR NICHOLS: Okay. Thank you.

Mr. Minassian.

MR. MINASSIAN: Chair Nichols, members of the Board, Good morning. I'm Fred Minassian, Assistant Deputy Executive Officer at the South Coast AQMD.

On behalf of South Coast AQMD, I strongly support the adoption of the guidelines with the proposed changes. I definitely thank Ms. Berg for her leadership in bringing the air districts and ARB together for the development of these guidelines. I would like to especially thank ARB

staff for its close cooperation with us throughout this entire process.

We have had extensive discussions on practically ever equipment category. And they have taken our comments and input and considered basically whatever we have said. So we appreciate that.

At the end, I would like to make one comment that we would like to request, because I didn't hear throughout the presentation of your staff, our year '19 Carl Moyer Program announcement is already out in the street. And we had discussions with refuse haulers. And there are a couple hundred of them that would like to repower their engines to the 0.02 gram 8.9 liter engine that is already certified and commercially available.

However, the Moyer guidelines the way it's presented has a cap of $30,000 per engine. Based on our discussions, and calculations, and consultation with the engine manufacturer, if that cap is raised to 40,000, all the cost effectiveness and everything else, all the other requirements will be met, and we'll be able to repower maybe couple of hundred of these trucks just this year.

So we would like you to consider that. We know that your Executive Officer can come with these changes later. But I would like to mention this -- having this opportunity, and also again, thank your staff and strongly

support the adoption of the guidelines.

Thanks for --

CHAIR NICHOLS: Just a question. Are the trucks you're referring to only in commercial fleets or would they be public agencies -- would public agencies also be eligible?

MR. MINASSIAN: Both would be eligible.

CHAIR NICHOLS: Both. Okay. Thank you.

MR. MINASSIAN: Thank you.

CHAIR NICHOLS: Mr. Lawson.

MR. LAWSON: Good morning. Thomas Lawson, California Natural Gas Vehicle Coalition. I want to first start off by saying that the Carl Moyer Program has been a leader in incentivizing technologies. And we think it's a great program. And I also want to applaud ARB staff for all the time and energy that they put in into ensuring that this program continues to be a leader and makes some updates.

We submitted a comment letter, and I'm going to try to sum up the comment letter in a few quick points. One, we look forward to continuing to work with staff. We had, I think, a great conversation a couple days ago talking about a grant calculator, you know, trying to provide an opportunity for public and private fleets to be able to really be able to easily calculate the maximum

grant eligibility.

We look forward to working with staff to develop that a little bit more. It seems it's a little unclear and a little unwieldy at this point to try to get that information. We obviously want to remove any barriers, large or small, to fleets, you know, trying to access these programs.

I think there is a second issue that, you know, we're, I think, working to try to clear up, which is the definition or the understanding about SIP credibility of new purchases. In the 2011 guidelines, there was the ability to incentivize new purchases. And then that paragraph has been removed. And I know we've exchanged some emails with staff, and we're trying to get some more clarification on that. But we think that's important to try to figure out if new purchases are eligible for SIP credibility, and what does that mean for the new purchases.

I think the third and last thing I will say is that there also seems to be a little bit of confusion about whether or not -- which programs you can combine with Carl Moyer. And I know we're also working with staff on that. You know -- you know, there -- the implementation manual for HVIP was just approved, and we know that they're -- that program is off and running. And

so I think that there just needs to be a little clarification about what types of programs you can combine with Carl Moyer, and -- in order to ensure the success of those programs.

So we think that's important. Obviously, in the HVIP program, you can get up to 25,000 on the low-NOx engine voucher. We know most folks are getting approximately about 9,000 per voucher. And so being able to combine those programs will help ensure that people can access both programs to get a decent amount for an incentive.

So those -- those are some of our comments, and we look forward to continuing to engage with staff. I think we also, again, just to applaud them for what they've been doing, and we look forward to further conversations.

Thank you.

CHAIR NICHOLS: Thank you.

Andre Freeman.

MR. FREEMAN: Good morning, Chair Nichols and Board members. My name is Andre Freeman, and I'm here representing the California Energy Commission's Alternative Renewable Fuel and Vehicle Technology Program, also known as the ARFVTP. For those that are not familiar with our transportation funding program, the ARFVTP

provides upwards of $100 million per year to transition California's transportation sector, on both the fuel and vehicle side, to help attain the State's environmental policies.

Over the past nine years, this has included investments in in-state biofuels production, advanced vehicle research development and deployment, workforce training, outreach, education, and planning efforts, as well as significant investments in California's network of natural gas and hydrogen fueling stations, as well as electric vehicle charging stations. These infrastructure investments to date have totaled over $200 million.

I'd like to commend the ARB staff on their development of the new Moyer guidelines that will further support California's goals on greenhouse gas emissions reduction and air quality improvement. With the new addition of charging and fueling infrastructure as eligible costs, future Moyer investments in this area will provide a great opportunity for California to expand its much needed vehicle fueling and charging infrastructure.

While this infrastructure funding could provide a great opportunity, it also poses a unique challenge. The numerous investments in this area by the State's many funding programs are -- need to be strategically implemented to best leverage these public dollars. To

address this challenge, Energy Commission and Air Resources Board staff, and all the transportation funding programs have worked to utilize lessons learned from previous investments, coordinate investments to grant unintended overlap, focus funding on the areas of highest need, utilizing tools, such as CalEnviroScreen, and have ongoing dialogue to ensure that the State agencies are making investments based on the best information that's available.

With that, I'd like to thank you for the opportunity to speak today, and look forward to the continued dialogue between our two agencies, and further funding to transition our transportation sector to both near-zero and zero-emission technologies.

Thank you.

CHAIR NICHOLS: Thank you.

Dave Johnston.

MR. JOHNSTON: Good morning. Dave Johnston with the El Dorado Air District. Thanks to your staff that have on this guideline revision over the last year and a half.

I participated in the infrastructure workgroup and would like to request two things. In support of the Governor's goals, we have actively promoted the expansion of electric vehicle charging infrastructure by obtaining

grants, by utilizing 2766 funding, and by working with EBSC companies.

In 2014, there were eight chargers on the county. Today, there are 85. We've learned it's very difficult to convince commercial property owners and public property administrators to allow the placement of EVSC in their parking lots, even when 100 percent funding is provided.

The draft guidelines include a recommendation to limit the majority of public EVSC infrastructure to 60 percent funding. I respectfully request that your Board direct staff to increase the allowable percentage to 100 percent.

The second request is to include a residential charger incentive as an eligible project type. EV charging is different from gasoline vehicle fueling. Over 80 percent of all EV charging is done at home. Most EV drivers leave home with a full charge, make their commute, and return home in the evening to charge again.

Public EVSC served two primary purposes: One to help long-distance drivers, and two, to allay the concerns of those considering purchasing an EV that they won't be stranded somewhere.

For the cost of one public charger, ten residential EVSCs can be incentivized. A public charger might get used by two drivers in a day. Whereas -- that

is if the host is paying for the electricity. If there's a fee for using the charger, then very few people are going to use it.

Residential EVSCs are used every night and the residents pay for the electricity. As EV ranges continue increasing, level 2 charging will be needed to residents to fully charge the batteries overnight. So from both a practical and cost-effectiveness standpoint, funding residential chargers is more sensible than funding public chargers.

All of the air district representatives that participated on the infrastructure work group were in support of including residential EVSC charger incentive eligibility. The states reason for not including residential EVSC was that it would be viewed as a gift to the rich.

To date, many EV buyers do report higher incomes. But as EVs continue to become more affordable, that's going to change. If that same reasoning was applied to all Moyer projects, many of them would be ineligible.

Many Moyer recipients are higher income in corporations. Examples include large trucking companies, waste disposal companies, mining companies, heavy-equipment contractors, commercial farming operations and locomotive and marine vessel owners.

El Dorado County drivers have paid tens of millions of dollars in tire and smog abatement fees. Yet, very little of that funding has come back to El Dorado County.

For the first 16 years of the Moyer Program, the El Dorado --

CHAIR NICHOLS: Excuse me, that was your time limit.

MR. JOHNSTON: I'm sorry.

CHAIR NICHOLS: Did you have written testimony?

MR. JOHNSTON: Just notes. No, I have --

CHAIR NICHOLS: All right.

MR. JOHNSTON: I was pretty much to the end there.

CHAIR NICHOLS: Ms. Berg has a question for you before you leave.

MR. JOHNSTON: Okay.

VICE CHAIR BERG: Thank you very much for bringing up the residential charging. When you like at residential charging, I know when I bought my first EV, I got the package that was like $2,200. But when we installed charging -- 220 charging in our home up here, we just put in a simple 220 plug.

MR. JOHNSTON: Outlet.

VICE CHAIR BERG: Yes. And, you know, it was

significantly less expensive. When you're looking at this type of charging, I think one of the things I'm concerned about is can we do it cost effectively?

MR. JOHNSTON: I believe that you can. In order to use a standard 240 volt plug like for a drier, you've got to convert the cord that comes with the vehicle from the J-1772 configuration to a standard drier-type plug. So you're spending additional funding there anyway.

So there are a lot of J-1772 standard 240-volt chargers available, ranging anywhere from $500 to $1,000. Home Depot sells them. Cost of installation by an electrical contractor is in the range of three to five hundred dollars. So I think for -- an incentive similar to the amounts that are going to be available for folks changing out wood stoves we could actively promote -- further promote EV acceptance by helping folks put in 240-volt chargers.

Thank you.

CHAIR NICHOLS: Okay. Thank you.

Bonnie Holmes-Gen.

MS. HOLMES-GEN: Hi. Good morning. Bonnie Holmes-Gen with the American Lung Association in California. I'm here to support the Carl Moyer Program revisions. And the Lung Association has been a supporter of the Carl Moyer Program since its inception. And I do

remember its inception, and we are indebted to the vision of Dr. Moyer and all this program has accomplished.

Almost a billion dollars spent has resulted in tremendous air quality and health benefits, and have definitely moved us forward toward our air quality health-based goals in California.

Over the years of the program though, we have struggled with the need for the program to better include and promote advanced technologies, such as electric and hybrid technologies and the infrastructure to support those technologies. And I think the discussion about the electric school buses today has been a good example of a technology we've really wanted to support to improve community health and especially children's health.

So we are very supportive of the proposed changes to date. It will finally bridge that gap. The Lung Association is, of course, very strongly behind the push to zero emissions as a key solution for our air quality and climate -- to reach these -- our air quality and climate targets.

And we know from our recent Clean Air Future report that California, just by looking at the light-duty sector, and what we could achieve by moving to a majority of vehicles -- zero emission vehicles in the light-duty sector, we've calculated 13 billion annual benefits, air

quality and health benefits for California, and we know that we could achieve far more benefits from moving -- from achieving that transition in the heavy-duty sector.

And now, we believe that with these changes, the Moyer program can be a more helpful tool to make that happen.

So, in conclusion, we're very appreciative of the staff's work. We're very appreciative of Dr. -- excuse me. We're very appreciative of Board Member Berg's leadership and work in the committees that were mentioned. We participated in those committees and public outreach. It was a very helpful process.

We support the update to the program, as a key strategy for building toward a healthier future and transitioning to zero emissions. And we look forward to continuing a strong partnership between the Air Board and the districts to implement the program at the local level.

CHAIR NICHOLS: Thank you.

Bill Magavern.

MR. MAGAVERN: Good morning. Bill Magavern with the Coalition for Clean Air in support. We support AB 8 and SB 513 and participated in the advisory group. And we think that these guidelines represent a faithful implementation of those laws.

We're particularly supportive of the fact that

you're trying to give support to the cleanest possible vehicles and technology and infrastructure. We need to, as you have recognized, move to zero-emission equipment wherever it's feasible, and where it's not feasible to deploy near-zero emission equipment with renewable fuel. So it's important that Moyer be one of the sources of funding for that.

And I would also note that we support Moyer and the various other incentive programs that were noted in the staff presentation. But even with all of them together, they're not nearly sufficient to fund that massive turnover of vehicles that is called for in the SIP, and that is necessary to get to healthy air.

So we will continue to work with you and others to try to find more sources of incentive funding for Moyer, as well as additional programs.

Thank you.

CHAIR NICHOLS: Thank you.

Mr. Carmichael.

MR. CARMICHAEL: Good morning, Chair Nichols, members of the Board. Tim Carmichael with Sempra Energy Utilities. Here to support the update to the guidelines, but want to raise just a few points.

I think the staff did a good job of highlighting how many different challenges we are currently trying to

solve with this program funded at about 60 million a year, which means, at least historically, 10 to 15 million for trucks.

Put that in context, we're really in the need of roughly $700 million a year, if we want to achieve the fleet turnover that we've been talking about between now and 2030. So 10 to 15 million is only -- it's literally a drop in the bucket, important still.

I want to echo the comments of Mr. Lawson on the points he made about the need for clarity on what programs -- what incentive programs can be combined. It's important for those that are considering applying to know how they might be able to combine different programs, and we'll continue to work with staff on that.

Similarly, on the calculator, I can't overstate how important this is. If you're a small trucking fleet, and you're already fearful of the Air Resources Board, and you're thinking about applying for an incentive program. If you can't quickly determine what you might be eligible for, you probably won't take the step of applying.

So, you know, imagine that you're thinking about refinancing your own home. You know, you have all these tools on-line now, where you can quickly get an estimate of your rate and what your monthly payment would be. It's a similar concept when it comes to being able to identify

how a program might work for you.

And granted, it's complicated. There's a lot of different factors that go into this, but we need some form of calculator that we can share with the potential applicants for this program, and we'll continue to work with staff on that.

Finally, just appreciate all the time and effort that this Moyer team has put into this program. It's been a success for many years, and it should be -- should continue to be a success for many years to come.

Thank you.

CHAIR NICHOLS: Thank you.

Eileen Tutt. Last witness.

MS. TUTT: Good morning. Eileen Tutt with the California Electric Transportation Coalition. I have submitted my captivating comments already, so you have them in writing. I don't want to dupli -- I don't want to repeat those.

But I have a couple of additional thoughts just listening to the staff presentation, and the testimony today. I want to just tell the staff and everybody on the Board that utilities in California are investing heavily in infrastructure to support electrification of the transportation sector. And we look forward to working with you, in the context of the Carl Moyer Program, to

leverage any Carl Moyer investment in infrastructure, so that we can get the need -- necessary infrastructure for electric vehicles.

And then finally, I want to say that the staff -- we really support, strongly support, the staff's recommendation here in the proposal before you. The technology advancements in transportation electrification have far exceeded what any of us expected, I believe, even six years ago, five years ago. And we continue to get new announcements on things like Class 8 all-electric trucks, which, to be honest, I didn't think was ever going to be a reality.

So we know transit buses and ground support equipment at airports and seaports makes a lot of sense, but I think we're going to see in the next five years some really -- much unexpected, unanticipated advancements. And I think the Moyer Program modifications recommended will support those new innovations.

So thank you.

CHAIR NICHOLS: Thank you.

That concludes the list of witnesses that we have today.

BOARD MEMBER RIORDAN: Madam Chair?

CHAIR NICHOLS: Yes.

BOARD MEMBER RIORDAN: I have a question for the

staff.

CHAIR NICHOLS: Okay. Go right ahead.

BOARD MEMBER RIORDAN: Just briefly to the staff. There was a suggestion about changing the base cost effectiveness by one of the speakers. And I don't know if you've had time to think about that, but I would like some response to that, to know whether or not that -- it should be supported or if there's a good reason not to support it.

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI:

Yes. Mr. Minassian from the South Coast District made a suggestion and I believe that's the one you're referring to that suggested --

BOARD MEMBER RIORDAN: (Nods head.)

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI:

-- we increase the cost effectiveness or the cap, is really what it was, on repowers for low-NOx natural gas engines, zero emission -- or low-NOx natural gas engines as a practical matter.

And as part of that, we've been working with him for the last, I mean, week or two on new information that he had available. We've looked at that, and we think there is merit to that. So that actually -- I think -- I think folks ended up missing it, but it was inserted into Neva's presentation there. So we are recommending that be

part of this proposal.

BOARD MEMBER RIORDAN: Okay. Fine.

CHAIR NICHOLS: Oh, great.

BOARD MEMBER RIORDAN: Yeah, because I --

CHAIR NICHOLS: Because we don't have to do anything then.

BOARD MEMBER RIORDAN: I missed it as well, and I thank you very much.

CHAIR NICHOLS: We don't need an amendment then? Okay. Good. Great.

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI: No.

BOARD MEMBER RIORDAN: Thank you.

CHAIR NICHOLS: Other questions or comments at this point?

VICE CHAIR BERG: The only one I'd like to follow up on is also the request about the EV charging from Mr. Johnston and the El Dorado. And specifically, I'd be interested in how we might be able to bifurcate for the smaller districts opportunities for them to fund in a different way. So those two things.

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI: Certainly. Let me start with -- with the comment. Actually, you've heard maybe a little surprisingly coming into this, the majority of the

commenters actually mentioned infrastructure as one of the key areas in different ways. But infrastructure is at the core of a lot of this.

And I think one of the starting points is that there is a lot of activity going on in this space. And this is sort of influenced how we approach this, whether you're looking at CEC who's been doing infrastructure projects for years and years, utilities, especially more recently our even greater involvement, there's been settlement money in this area, and then Volkswagen will be coming in the space.

And the Carl Moyer -- infrastructure is not at the core of the Carl Moyer Program. It is something that we're looking to help enable and help fill and bridge gaps. And so that ended up influencing how we approached a lot of this. That ended up influencing the limit up to 65 percent of payment, because we're looking for it to help incentivize and bridge different projects, but not necessarily drive the entire project, except maybe when it came to school buses where we allowed 100 percent in that case.

On the public charging, I think similarly, we looked at that space and we said, well, from the surveys that have gone on on EV owners, or potential EV owners public infrastructure and workplace charging continue to

be at the highest part of the list. Residential charging is usually pretty low as a concern in advancing EV sales. But those two are at the highest, and we allowed that as part of this program.

Multi-family dwelling, trying to get charging in condos and apartments is always a challenge and needs the boots on the ground. And the districts might be able to play a really key role in helping to advance that, and so we allowed that as part of it.

And then you get into that balance we always have of, you know, are we doing enough for low income and -- and especially for the used EV market? And so we did allow residential charging. And part of this proposal is residential charging for low-income residents. So we have public, and we have workplace, and we have multi-family dwelling, and we have low income. We didn't quite go as far as Mr. Johnston wanted. But even there, we left the door open and said, well, on a -- we'll continue to evaluate it on a case-by-case basis. We can continue to monitor the technology and the need and look at that and the Executive Officer would have the ability to do that.

We could add the overlay you're suggesting, and say are there different needs in rural areas maybe versus urban areas? And does that, you know, influence when we

come in on a case-by-case basis?

VICE CHAIR BERG: So what I'd like to suggest is that you just follow the outline that you just gave us in really looking at what we have for our smaller districts, because I know often they are not -- aren't able to take advantage of their Carl Moyer money for a variety of funds. And one of the exciting things I saw in these amendments was it was going to open up that flexibility. And so I'm happy to hear that you're seeing that -- that you're looking at that, and I would encourage that.

One other follow-up, I would like just to hear just a brief understanding on -- on Andre Freeman's comment on coordinating these efforts on these multiple programs, what you just also identified. How do you see that happening?

And then also, how do you see that kind of overlapping with the business model we need to create for ongoing charging?

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI:

Certainly. It is -- it is a good challenge to have, I'll say it that way to start. In both the light-duty and the heavy-duty sector, there is a lot of interest. There's a lot of activity. We are responsible for coordinating, you know, not only the Carl Moyer Program, but the AQIP program, and the -- Greenhouse Gas

Reduction Fund, our low carbon transportation funding, not just with CEC, but with local district funds, with port funding, and when we can -- when we can grab it, federal funding as well.

It is an ongoing part of this discussion. I would say one of the areas we try to use is tools and road maps that we've put out. And the Mobile Source Strategy and the State Implementation Plan are key road maps to signal where the ARB and the State of California needs to go. The Sustainable Freight Action Plan, the Governor's ZEV Action Plan, those are all key high-level plans that we can then use to coordinate our incentive programs with these various agencies and say are these consistent?

And we do that on a regular basis, both at staff level and very regular meetings at the staff level, and then higher management level meetings too.

VICE CHAIR BERG: Okay.

CHAIR NICHOLS: Okay. Any other -- yes, Ms. Mitchell.

BOARD MEMBER MITCHELL: Thank you. I, first of all, want to thank staff, CAPCOA, and Vice Chair Berg for all the work that was done on this. And this program has been very, very important for South Coast Air Quality Management District and a very successful program. And we're so pleased to see these changes, and that, you know,

it's been extended another ten years or so for us to keep working with this.

Again, as mentioned, it's not enough money. And so, you know, we, on this Board, as well as on the local boards need to keep working together to -- to get the incentive monies that's going to be needed for turnover.

I understand we won't need any kind of amendment to raise that cap to 40,000 for refuse trucks. Refuse trucks, both public and private, are a big part of the truck movement in our regions particularly urban regions. So this would be an important area to assure that we have some turnover.

The other question I have is that the 0.02 12-liter truck is expected to be certified soon and available for purchase by January 2018. What -- is that truck eligible for the 100,000 amount, would that be the case?

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI:

Yes, absolutely. And I'll go a step further and say when we were designing the limits, we specifically considered we want to be able to support, you know, not just the 8.9 liter that is out there now, but the 12 liter that's coming out next year, as well as the zero emission technology. And the limits were set at levels where we think we'll be able to provide meaningful funding to

promote those technologies.

BOARD MEMBER MITCHELL: That's really important, because we see, in the South Coast and probably in the Bay Area as well, that truck as being very useful turnover for drayage fleets in our ports. So I'm glad to hear that we're -- that we're getting there.

Another comment that was made was we need to make it easier for small fleet owners to know what it is that's available to them. That could be done on a website. I guess one of the questions I had, as I heard that comment, was would that be something that the district ought to do or would it be something that ARB would do on their website?

I mention it, because in the district, we've seen differences in what kinds of things are funded, both in San Joaquin and the South Coast. South Coast is looking more at heavy-duty trucks and San Joaquin perhaps looking more at off-road vehicles, agricultural vehicles. So I'd just like to know your comments on that.

Should we be looking to our respective air districts and saying let's modify our website, so we have this information on there? There's going to be different kinds of co-funding available. And that's where I think, you know, that information needs to come up.

If you apply for Carl Moyer, you could also apply

for a fund in DERA or funding -- DERA -- if DERA gets extended. We're not sure if that's going to happen. But what the other funding sources are, I'd like your comments on that.

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI: Sure. So the comment came up in the context of a calculator a simple-use calculator by Mr. Lawson, and Mr. Carmichael. But I think it's -- I think you're taking it broader, and I would take it broader as well. What are the tools, and are they -- do we have enough sufficient tools out there to help fleets understand and not even just in the context of a Moyer, but as the discussion went earlier all of the various different incentive programs that are out there, and they mix, and, you know, they have different timings, and how do we do that?

An some level, it absolutely, I believe, is a State responsibility to be able to put together a calculator. For example, on the heavy-duty side, for heavy-duty trucks, it -- I don't even think that would have been a practical endeavor. A couple of years ago, as the Truck and Bus was going through, a lot of transitions, and there were a lot of exemptions that were coming in and phasing out, and it would have been the -- it would have been too complex to even design a simple calculator. It would be misleading --

CHAIR NICHOLS: We had people working full time answering those questions on a case-by-case basis. It was really hard.

MOBILE SOURCE CONTROL DIVISION CHIEF KITOWSKI: Right. But today, much of the truck and bus exemptions are now moving away. And I think that calculator actually is a -- it's -- I think it's a very ripe idea, and we would look forward to working with the districts.

But taking your suggestion even further, are there -- are we doing enough to outreach, especially to the small fleets? Are there different tools we can use in these days, in social media? And we've always looked at associations and outreaching directly to associations, and trying to access them. The districts play a key role in doing that on a regular basis.

But it -- now that we're through sort of the technical behind-the-scenes stuff that, you know, we do here, maybe it is -- it's a really good time to turn it over to those who look at more of the outfacing part, and what do we do now? What's our next steps?

Quite honestly, we haven't given it a whole lot of attention yet. That's a good area to focus on.

BOARD MEMBER MITCHELL: Yeah. I would -- I would ask you to focus on that. I think that that's a good

direction that we should be going, and -- because one of the challenges in the South Coast, and maybe other places in the State are that we have so many small fleets. And those really are probably the highest contributors to our NOx problems, our emission reduction goals.

So I would see some tools like this that would make it easier for our small fleets to access information, to decide to engage in a turnover of their fleets would be very useful in the long run.

And thank you so much for all the work you've done.

CHAIR NICHOLS: Congratulations on having gotten us to this point. I'd hate to bring up unpleasant memories of the past, but I can't resist mentioning that when we first started down this path, and it was a couple of years ago, I attended an initial meeting, which I recall as being a lot more like a group therapy session --

(Laughter.)

CHAIR NICHOLS: -- than an actual workshop, because of the history of difficulties between the districts and the Board, and really some fundamental questions about what the program was about, what it was meant to be and all of that. And we've obviously come a long way since then. And many people deserve thanks and credit for that.

I would just like to say though that the fundamental -- at the core of this is the fact that there is very widespread recognition now of the need to turn over the fleet, and that it's going to cost a lot of money to change our transportation system to be what it needs to be to meet the public health goals that we already have, as well as our climate goals, and just our sustainability goals for our State.

So I'm thrilled that we're at the point where we can launch a new set of guidelines for this program. I'm really pleased at the support, and at Jack's comments about the desire of the staff to focus on making it easier for people to access the funds because transaction costs are a factor also. And so we definitely need to be doing everything we can to make it easier for people to apply for the funds that are available.

And lastly, although, it certainly doesn't solve all problems and can't, I do think that the shift in emphasis towards not just needing current regulatory requirements, but really looking towards future needs is a very significant one, and one that everybody should acknowledge and take credit for.

So without further ado, if there are no more comments, let's have the resolution.

VICE CHAIR BERG: I would like to move 17-4-6.

BOARD MEMBER ROBERTS: Second.

BOARD MEMBER BALMES: Second.

CHAIR NICHOLS: Moved by Ms. Berge and seconded by Supervisor Roberts.

All in favor, please say aye?

(Unanimous aye vote.)

CHAIR NICHOLS: Opposed?

Abstain?

None. Great.

Thank you all very much for this.

And we have one more item on the agenda before we will adjourn to our closed session. That is Item 17-4-8. This is a public meeting to hear proposed updates on the truck field enforcement activities and new screening technologies for high-emitting vehicles.

So this is exciting stuff.

This item is a joint effort from our Enforcement and our Monitoring and Laboratory Divisions. The Enforcement Division, of course, does inspections of vehicles around the State, and has been working with the Monitoring and Laboratory Division to develop a prototype system to enhance data collection and support enforcement efforts.

And the people who we need for this are making their way forward.

Mr. Corey, do you want to go ahead an introduce this item.

EXECUTIVE OFFICER COREY: Yes. Thanks, Chair.

Staff inspects vehicles and equipment as part of our enforcement efforts. Today's presentation provides and overview of our Truck Inspection Program and new technologies to support these efforts.

The new technology uses and automatic license plate reader. To comply with legal requirements, staff is presenting a new privacy and usage policy describing how data collected with this system will be protected in accordance with State privacy laws.

I'll now ask Shannon Downey to give the staff presentation.

Shannon.

(Thereupon an overhead presentation was presented as follows.)

AIR RESOURCES ENGINEER DOWNEY: Thank you, Mr. Corey.

Good morning, Chair Nichols and members of the board. Today's presentation provides an overview of the Enforcement Division's field activities, and discusses plans for implementing new screening technologies in the field, and their associated data protection policies.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: Here is a brief outline of what we will be discussing today.

First, I will discuss the challenges we face in addressing emissions from heavy-duty diesel vehicles on the road today, and give you a brief background on our current Field Enforcement Program.

Next, my colleague Dr. Walter Ham will discuss the in-house development of a new emissions measurement system that is the result of a joint effort between the Enforcement and Monitoring and Laboratory Divisions.

The new system collects different types of information, including emissions and license plate data. I will then discuss State law requirements to protect the collected data, and how CARB will comply with these requirements.

I will now begin with a brief background about emissions from heavy-duty diesel vehicles.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: The are many regulations that apply to trucks operating on the road. These regulations take the form of technology requirements like the Truck and Bus Regulation that generally requires all trucks today to use a diesel particulate filter, unless the truck falls within one of the flexibility provisions of the rule.

Other regulations require engine labeling, submission to inspection when requested, restrict idling, and require roadside testing to ensure trucks are in proper working order.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: As we have reported in the past, more than one million trucks operate in California each year. We have been working to streamline truck and bus enforcement through our smart audit approach. This allows us to target the highest priority non-compliant fleets first. Last year, we reported the overall compliance rate for heavy vehicles, subject to the truck and bus regulation is 70 percent. Our streamlined process is not enough to address this magnitude of noncompliance.

For the past two years, we have been working to build support to make vehicle registration contingent on demonstrating truck and bus compliance. Earlier this month, we were successful in having this requirement added to Senate Bill 1. We anticipate this new requirement will improve truck and bus compliance rates, and help us achieve the emissions reductions envisioned when the Truck and Bus rule was adopted.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: As we focus on

ensuring comprehensive compliance with the Truck and Bus Rule, we also want to make sure that the compliant fleet is achieving the desired emissions reductions.

For the last decade, CARB's Research Division has funded landmark studies evaluating emissions from trucks. CARB has conducted these studies both in the lab and at the roadside. This chart summarizes the results of these studies.

The bar on the left shows what emissions typically look like from trucks that do not have a DPF. The bar on the right shows laboratory-measured emissions of trucks with properly operating DPFs. A properly functioning filter reduces emissions by 99 percent. When the emissions of DPF-equipped vehicles are measured at the roadside, the fleet average reduction in emissions is 80 percent, which is represented by the middle bar in this chart.

The next few slides will illustrate this discrepancy between what we see in the lab and what we see at the roadside.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: These roadside studies have been conducted by Professor Robert Harley at UC Berkeley, and Professors Don Stedman and Gary Bishop at the University of Denver. Conducted periodically over

time, these studies use roadside emissions measurement equipment to take a snapshot of real-world emissions.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: This series of slides shows why the average emissions reductions from DPF-equipped trucks on the road is not always 99 percent. We have found that a small fraction of high emitting diesel particulate filter-equipped trucks contribute a majority of the total particulate pollution from filter-equipped trucks measured at the roadside.

The vehicles from the study are represented on the left side and their corresponding emissions on the right. What you are about to see is a progression of how each percentile of trucks contributes to cumulative emissions.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: The cleanest percentile of vehicles contribute almost nothing to the cumulative total emissions.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: The cleanest 20 percent of representative vehicles contributed only a small amount of the total emissions represented by the small blue sliver on the chart.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: Same with the cleanest 30 percent.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: And the cleanest 40 percent.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: In fact, half of all trucks with diesel particulate filters are responsible for less than five percent of all emissions from the DPF-equipped fleet.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: Here are the cleanest 60 percent of trucks.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: And the cleanest 70 percent of trucks.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: As you can see, 80 percent of all trucks are responsible for less than 25 percent of all of the emissions from the filter-equipped fleet.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: But the last 20 percent of the fleet have a very different emissions profile. The 80th to 90th percentile of trucks emit

almost as much PM as the cleanest 80 percent of the fleet.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: And the last 10 percent, the high emitters, are responsible for the majority of all emissions measured at the roadside. These trucks emit excess emissions as a result of an emissions-related malfunction, and are especially problematic when they operate in sensitive areas like disadvantaged communities.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: If we were to bring those 10 percent of high-emitting vehicles back to proper repair and compliance, the total emissions would be reduced by more than half. Ensuring trucks are operating in proper repair and compliance is critical to ensuring the emissions reductions envisioned in our certification requirements and in-use rules are achieved on the road.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: In the 1990s, CARB implemented a heavy-duty vehicle inspection program to help minimize emissions from vehicles operating on the road. The program requires fleets to test their trucks for opacity using the SAE J1667 Snap Acceleration Smoke Test, and establish a 40 percent opacity limit, which was designed to identify malfunctioning engines.

To enforce the regulation, CARB conducts random roadside inspections and fleet audits. The 40 percent opacity limit was established before trucks were required to have diesel particulate filters. The photo on this slide is an example of what 40 percent opacity looks like. If a vehicle's opacity exceeds 40 percent, they will be issued a citation.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: Modern vehicles have diesel particulate filters which eliminate visible emissions when functioning properly. Mobile Source Control Division staff is developing a proposed amendment to lower the opacity limit from 40 percent to five percent for diesel particulate filter-equipped trucks. The proposed amendment, which may be presented to the Board this fall, would also include reporting requirements and training for those conducting opacity tests.

These requirements help ensure proper testing and effective enforcement, both of which are critical to reduce emissions and protect public health. They also represent a strong first step in a transition to a robust heavy-duty vehicle inspection and maintenance program.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: I will now provide you an overview of how we determine compliance of

heavy-duty diesel vehicles in the field.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: Currently, the Enforcement Division conducts inspections of trucks in the field to determine compliance with many of the regulations I previously mentioned. Our Health and Safety Code givers us the authority to conduct these inspections.

We have field staff across the State that conduct inspections and issue citations when a -- when vehicles are found out of compliance. The fines can range from 300 up to 1800 dollars. The next few slides will give you an idea of what a typical-heavy duty diesel vehicle inspection looks like.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: For roadside inspections, CHP pulls over a heavy-duty diesel truck.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: The inspection begins with a check of the dashboard in the cab of the truck to see if there any illegal modifications or any malfunctioning indicator lamps.

Here, you can see this vehicle has no emissions related lamps illuminated.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: The inspector

looks for a number of things to determine if the truck is in compliance with diesel regulations, including a check for missing, modified or additional engine components that could indicate tampering.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: They verify the engine has legible emission control label.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: And the inspector checks to make sure the truck has a diesel particulate filter. In this case, the emissions control system, which consists of a diesel particulate filter and selective catalytic reduction are under the steps of the truck.

If the truck does not have a filter, the inspector will look up the truck in CARB's compliance databases to determine if it is registered as complying with the flexibility provision in the Truck and Bus Rule.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: If the vehicle has a DEF tank, they may test the concentration of the diesel exhaust fluid.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: Finally, the inspector looks for aerodynamic equipment on both the tractor and trailer to make sure they are compliant with

the Tractor-Trailer Greenhouse Gas Regulation, which helps reduce greenhouse gas emissions over the road.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: If the truck is compliant with the heavy-duty diesel regulations, it is sent on its way. If the inspector finds a violation, the citation will be issued on the spot. Most inspections take less than 10 minutes.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: In the field, if the exhaust of a heavy-duty vehicle looks like it might exceed the opacity standard, a full snap acceleration smoke test will be conducted with an opacity meter. Here, we have an example of what a dirty truck looks like when you conduct a snap acceleration test.

This vehicle was tested in August of last year. It was a 1992 engine without a diesel particulate filter in 2012 chassis, this set up is commonly referred to as a glider kit.

(Thereupon a video was played.)

AIR RESOURCES ENGINEER DOWNEY: This truck's average measured opacity was 89 percent, which is very high and very rare. The second video is what a properly operating DPF-equipped truck's exhaust should look like.

(Thereupon a video was played.)

AIR RESOURCES ENGINEER DOWNEY: The average measured opacity for this truck was zero percent. You heard the engine rev, and saw no visible emissions. This is how it should be with a filter-equipped truck.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: In 2016, we conducted 15,459 truck inspections, 56 percent of which were in disadvantaged communities. Of those vehicles inspected, we issued 4,292 citations, 54 percent of which were in disadvantaged communities.

In 2015, we committed to conduct more than 50 percent of our inspections in disadvantaged communities every year. We achieved that in 2016 and plan to do so in 2017 and beyond.

Inspecting more than 15,000 heavy-duty vehicles in a year is a significant accomplishment. However, there are typically over a million heavy-duty vehicles on the road in California every career, which means we need to find ways to be more efficient and targeted with our inspections.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: Now, I will turn the presentation over to my colleague Dr. Walter Ham who will introduce a prototype system he's been developing with his colleague Dr. Jeremy Smith to address this issue.

AIR RESOURCES ENGINEER HAM: Building off of the Harley and Stedman studies, we are developing an emissions measurement system that can be deployed by enforcement staff for research and enforcement screening purposes. This new system is portable, cost effective, and provides real-time results.

The system collects an emissions snapshot for each passing vehicle and takes a picture of the vehicle's license plate. Staff has built one system and is building one additional system.

--o0o--

AIR RESOURCES ENGINEER HAM: The portable emissions acquisition system, or PEAQS, consists of a trailer equipped with sampling and emissions measurement instruments. PEAQS is capable of measuring emissions from vehicles that have either a vertical exhaust stack or a low stack near the road surface.

Truck emissions are measured as they drive through. The trailer makes the system easily transportable, and is able to be deployed in many different locations, including disadvantaged communities.

PEAQS has the capability to incorporate an automated license plate reader system, which is a camera that takes a picture of a license plate and uses specialized software that converts the license plate

picture into a digital text file.

--o0o--

AIR RESOURCES ENGINEER HAM: Automated license plate readers are used in many places around the State. They are used as part of the FasTrak system, in parking garages and airports, and at CHP weigh stations.

--o0o--

AIR RESOURCES ENGINEER HAM: PEAQS serves many purposes at CARB. Staff needs information to characterize fleet emissions, not just for fundamental research, but also to inform emissions inventories for air quality planning. These data are used to justify regulatory development and implementation.

When initially deployed, PEAQS will be used to help prioritize enforcement and will help identify potential violators of a lower opacity limit, which may be more difficult to detect with the naked eye. Vehicles identified as high emitters may be targeted for further inspection and testing in the field or flagged for future follow-up through fleet audit. PEAQS cannot be used by itself to generate instantaneous enforcement actions.

--o0o--

AIR RESOURCES ENGINEER HAM: The following video summarizes how PEAQS works and includes some actual footage of trucks driving through the system.

(Thereupon a video was played.)

AIR RESOURCES ENGINEER HAM: Staff has developed software that compare emissions and vehicle data together. This will allow for easy cross-referencing of data for analysis. The automated license plate reader is a critical component of this system.

An automated license plate reader system is a combination of both the camera that takes a photo of a license plate, and the specialized software that converts the photo of the license plate into a data-searchable file.

Currently, the system pairs the emissions data with an image of the passing vehicle. Before using ALPR software, California State law requires any public agency that uses ALPR software to notify the public of its intended uses.

--o0o--

AIR RESOURCES ENGINEER HAM: I will now turn the presentation back over to Shannon Downey who will explain how we plan to comply with those State requirements.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: Senate Bill 34 was passed in 2015. It places specific requirements on a public agency's use of an automated license plate recognition system. The law requires development and

implementation of a privacy policy, a description of how the system is used, and detailed procedures for ensuring data security.

Additionally, it requires us to notify the public on our intent to use the system and provide the public the opportunity to comment on the policy.

Once we start using ALPR software, staff will manually review images to ensure that it has accurately converted the license plate image to text.

Finally, it requires us to protect the data when we collect it as an operator and when we analyze it as an end user. This discussion today, in addition to our work to this point, meets the requirements of SB 34.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: The draft policy we have provided to you spells out how we will comply with SB 34. The policy defines authorized data users including those who both collect and access the data. It also specifies data access requirements, including training, and requirements for keeping that data private and confidential.

Staff has a long history of working with Department of Motor Vehicle registration data, which are required to be kept strictly confidential, and will be using similar procedures for data collected using the

ALPR.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: Staff held a public workshop on March 3rd to discuss the use of the system. In that workshop, we provided the public an opportunity to comment on the draft policy and proposed procedures to implement it. We have received one comment. That comment asked us to clarify that when a vehicle drives through the system, it will not result in an immediate enforcement action. We have updated the policy to include that clarification.

--o0o--

AIR RESOURCES ENGINEER DOWNEY: In summary, diesel particulate filters are highly effective and CARB enforcement is focused on ensuring comprehensive compliance with the Truck and Bus Rule. The new requirements of SB 1 that link compliance to vehicle registration will improve truck and bus compliance rates, and help us achieve the emissions reductions envisioned when the Truck and Bus rule was adopted.

Lowering the opacity limit for filter-equipped trucks, deploying new technologies to improve research and enforcement for trucks operating with damaged diesel particulate filters, and transitioning our current program to a broader heavy-duty vehicle inspection and maintenance

program will ensure vehicles on the road are operating properly.

Going forward, staff plans to deploy the PEAQS systems for research and enforcement-screening purposes. To do so, staff will be implementing the new policy on ALPR use to comply with State legal requirements.

We appreciate the opportunity to present to you today, and will answer any questions you may have.

Thank you.

CHAIR NICHOLS: Yes. Ms. Mitchell

BOARD MEMBER MITCHELL: Yes, I have a question.

You stated that it will be the policy not to re -- that the test going through the ALPR and the opacity test will not result in any immediate action. I want to ask about that. What does that mean?

ENFORCEMENT DIVISION CHIEF SAX: Yeah, this is Todd Sax. I can answer that. So the current requirements that apply to the roadside are based on the J-1667 snap acceleration smoke test like we mentioned. And so what the PEAQS system does is it allows us to identify trucks that might potentially fail that procedure. And then we can either pull them over on the roadside at that time, and then apply that test. And then whether or not they pass or fail that test dictates whether or not they get a citation, or we can use the information, take it back to

our office, and use it to help prioritize the fleet audits that we do to investigate fleets for compliance with all of our rules.

BOARD MEMBER MITCHELL: Okay. So this would be like a preliminary screening that you -- that could lead to a notice of violation?

ENFORCEMENT DIVISION CHIEF SAX: Exactly. In order for us to be able to write a citation based on PEAQS, we would have to develop essentially a limit -- a regulatory limit to hold them to, and we're not prepared to do that just yet.

BOARD MEMBER MITCHELL: Okay. Thank you.

CHAIR NICHOLS: I guess a related question is then how does this new initiative fit with the plans to develop an inspection and maintenance program for trucks.

ENFORCEMENT DIVISION CHIEF SAX: Well, so we see it sort of as a continuum. So the development of the lower opacity limit is going to be really important, because what we see is a sizable chunk of a minority of trucks are generating a lot of excess PM that we can control.

PEAQS, on the immediate side, is going to help us understand how many of these trucks are really out there, get a larger sample size, and help prioritize for enforcement. As we transition into a heavy-duty vehicle

inspection program -- a broader I&M program, sorry, we'll move more towards an on-board diagnostics based system. And that will also require roadside work to follow up on, but there's a lot of work to be able to evolve PEAQS to be able to evaluate, for example, NOx emissions, and whether or not a truck is a high emitter because it's actually -- has a problem with its emissions control system or the control system is just cold.

So there's more work to be done on the NOx side, and we're doing that, but immediately it's going to help us with the particulate matter issue.

CHAIR NICHOLS: With this understanding, the 80/20 rule, it's like a statistical rule of life, right? I mean, everywhere you turn that's what you find out is the answer. So shouldn't we be approaching the whole system from that perspective?

ENFORCEMENT DIVISION CHIEF SAX: Well, I think we are. As an agency, there are a number of things we're doing to try to get our arms around this issue. So, you know, one of the things we mentioned we did a study back in 2015 and looked at what was causing some of these issues. And it's a combination of a lack of durability in some engine components. And we're working to address that through warranty and other regulatory amendments that are currently under development, the Mobile Source Control

Division and ECARS are working on that right now.

So we're working on the front end from the manufacturer's side. This effort looks at the back end, and tries to ensure that vehicles are kept in a well-maintained -- are kept well maintained and their emissions controls are also well maintained to make sure we get the emissions reductions in the field.

It's a lot like the movement towards where we ended up in the light-duty sector, where initially we had emission standards, and then the Smog Check program was developed. We're doing something very similar here in the heavy-duty sector.

CHAIR NICHOLS: Hopefully, on a shorter time frame.

ENFORCEMENT DIVISION CHIEF SAX: Yes, absolutely.

(Laughter.)

CHAIR NICHOLS: Thank you. Any other comments or questions?

BOARD MEMBER RIORDAN: Madam Chair.

CHAIR NICHOLS: Yes, Ms. Riordan.

BOARD MEMBER RIORDAN: Just a comment. In the briefing that I had, and I appreciated that from the staff, I'm always impressed when we develop some of the equipment. We've done this before, and we're doing it again. And it's in-house, and I'm very pleased that

somebody has got the innovation to be able to do that. And it seems to me to be a great opportunity to really check some of these vehicles, trucks particularly obviously, because, you know, we're asking people to have these clean fleets. And every once in a while, I come across, as I'm sure my colleagues do to, those who are really emitting incredibly a number -- you know, how many emissions I'm not sure, but, boy, the black smoke is really coming out.

And, you know, it's hard to report them. I know that some people are able to do that, but I would suggest it's not easy to be driving seriously on the L.A. Freeway system and taking down some, you know, number from a truck license. That's just not practical.

CHAIR NICHOLS: You're supposed to use the camera that's in your eye glasses.

(Laughter.)

BOARD MEMBER RIORDAN: Mine has failed unfortunately.

(Laughter.)

BOARD MEMBER RIORDAN: But anyway, this is going to be a great system to help us identify those who are really the serious polluters.

CHAIR NICHOLS: Yeah.

BOARD MEMBER RIORDAN: I appreciate that, staff.

BOARD MEMBER MITCHELL: Madam Chair?

CHAIR NICHOLS: Yes.

BOARD MEMBER MITCHELL: I just want to mention that it's not the top of the list of complaints I get, but it's near the top, is our enforcement of this heavy-duty truck emissions. And so I think SB 1 will help us with this, which requires the smog check for heavy-duty trucks. And certainly these kinds of programs will help.

But, you know, just so you know the public is very aware of what's going on out there. And I do hear a lot of complaints about smoking trucks. And I remember Hector voting no on something that came up with Truck and Bus Rule early on after I joined this Board. And later I said, "you know, Hector, what was that vote"? And he said, "I'm just so tired of seeing these smoking black trucks on the road".

So, Hector, you're not alone. There's others out there that are issuing that same complaint. So I urge us to step up our enforcement efforts. And these kind of tools will help us do that.

Thank you.

CHAIR NICHOLS: Thanks. We did have one witness sign up. Sean Edgar.

MR. EDGAR: Chair Nichols and Board members. Sean Edgar. I'm the director of cleanfleets.net here in

Sacramento, and happy to just offer a couple comments relating to carrots and the sticks.

In my 17 years of dealing with the diesel enforcement program, I've found your staff to be generally firm but fair. I would just add a few comments pertaining to the need for more tools. So I think directionally This is headed in the positive direction to provide more tools to ARB staff to go out and enforce rules over the road. I think you saw a variety of our members, and many of the associations that are present here today at some great effort supported SB 1, especially the component that had to deal with the enforcement of the DMV component that was mentioned earlier.

And so I think those associations largely have -- their members have invested hundreds of millions or millions of -- billions of dollars in the clean technology. And on behalf of those clean fleet owners, those are the folks whose investment should be validated. And so I think the direction we were moving in a positive way.

I would just offer a few brief comments. Mrs. Mitchell mentioned outreach. And part of the outreach for the last item -- I'll touch on carrots first. The Moyer item is very important as it relates to making funds available, not necessarily for compliance with the Truck

and Bus regulation but for doing things faster and in addition. And I would just submit that the discussion about web posting and -- that's all great, but actually boots on the ground in front of associations, and fleet owners, and non-traditional ways. I know a little bit about that, because over a five-year period, we did about 175 small group meetings for about 6,000 fleet owners on your behalf. And so it's a challenge.

Those oftentimes have to take place on evenings, weekends and place -- and times when small businesses aren't working. And so getting creative, I'm happy to be a resources to your staff to do that. We have some experience in doing that.

But in the time I have left, I'll just touch briefly on the item before us. And really with regard to compliant fleets, they deserve, I think, fair enforcement. And I think this will head toward that direction. I attended a workshop a few months back pertaining to the reduced opacity limits. Dr. Sax had mentioned that. And I think that's a work-in-progress, as well as tightening emission warranties.

There's a bill in the legislature now that deals with the lemon law for heavy-duty trucks. So we have a lot in play relative to performance And deterioration of components, so I need time to work with Board staff on

that.

And I guess finally, I would just say the common theme to tie with the staff presentation is that ability to tighten the enforcement program, provide more visibility, and provide more results is probably a better thing for the environment. We'll continue to work with ARB staff as these programs develop.

Thank you.

CHAIR NICHOLS: Thank you.

Okay. No further action required on this item.

But before we adjourn, we need to take general public comment. And we have one person who signed up. Her name is Eleanor Torres, and she's a member of our Environmental Justice Advisory Committee, but she's here commenting as a member of the public.

Hi.

EJAC MEMBER TORRES: That's right. I think I can be that too.

A couple months ago Incredible Edible Community Garden, or IECG, became embroiled in the debate around cap and trade. As a co-executive director of an environmental equity organization, and a member of the EJAC, our organization thought it was important to study the issue, to inform our community accordingly.

After deliberating with our founder, Dr. Petit,

and our research intern, we rallied to create a white paper on studies to date regarding cap and trade. This effort was not funded by anyone and was done solely as a volunteer -- on a volunteer basis.

The white piper presents, and you all should be getting a copy of it --

CHAIR NICHOLS: We have it. Thank you.

EJAC MEMBER TORRES: Oh, great. The white paper presents the key elements of the California Cap-and-Trade Program, a hybrid emissions trading program, and its compliance instruments, the mechanisms to mitigate adverse effects on disadvantaged communities and what co-benefits, if any, have been derived to date.

It also provides a comparison to carbon tax programs. This paper is an overview of many of the credible analyses published on these topics, which are in the bibliography. It is not meant to be an exhaustive discussion nor does it get into the minute details and nuances of the programs, which are better left to the experts.

References used in researching this paper are included. This process has been a remarkable experience for all of us, and we really, really welcomed it. Right now, it's impossible to go into all the ways. We, at IECG, are appreciative of the hard work ARB staff and

Board has done in trying to ensure disadvantaged communities are not adversely impacted by cap-and-trade policies.

You have heard me say that this effort feels no different than the work I had the privilege to do when working to put the first spaceship on a planet in 1976.

The Inland Empire community is looking forward to this continued partnership with ARB to bring effective programming to our most vulnerable communities.

At this point IECG does not think cap and trade should be replaced, but improved based on our experience in our dax and the current data. We believe we have -- must do more robust review of the data to date to guide the process.

Finally, we want to thank you for the opportunity to present you with our white paper. It's the first one we've done, and we hope to do many more. We hope it will be helpful, as you continue your work. And we have begun to circulate the paper throughout our network and look forward to engaging our community on it.

Thank you so much for everything.

CHAIR NICHOLS: Thank you for all this work. It's really impressive for a volunteer organization to have pulled something like this together.

Obviously, we're grateful that it's supportive of

our program. But I think beyond that, it's just an impressive contribution to the discussion.

So thank you.

EJAC MEMBER TORRES: Well, we see it as a very, very, very important program in our DACs and we're happy to support it.

Thank you.

CHAIR NICHOLS: Thank you.

Okay. With no further requests to comment, we will adjourn. We'll have a closed session. And at the conclusion of that, we'll come back and report any decisions that are taken. So thanks, everybody.

(Off record: 11:55 a.m.)

(Thereupon the meeting recessed into closed session.)

(Thereupon the meeting reconvened open session.)

(On record: 12:50 p.m.)

CHAIR NICHOLS: Okay. We're back on the record. The Board met in closed session with our General Counsel, heard a briefing on several pending cases, and discussed them, but no decisions were made.

So we will be adjourned.

12:50 p.m.

(Thereupon the Air Resources Board meeting adjourned at 4:44 p.m

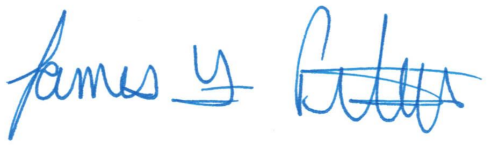
C E R T I F I C A T E OF R E P O R T E R

I, JAMES F. PETERS, a Certified Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing California Air Resources Board meeting was reported in shorthand by me, James F. Peters, a Certified Shorthand Reporter of the State of California, and was thereafter transcribed, under my direction, by computer-assisted transcription;

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this 10th day of May, 2017.



JAMES F. PETERS, CSR
Certified Shorthand Reporter
License No. 10063