Electric Vehicle Supply Equipment (EVSE) Technology Review Workshop

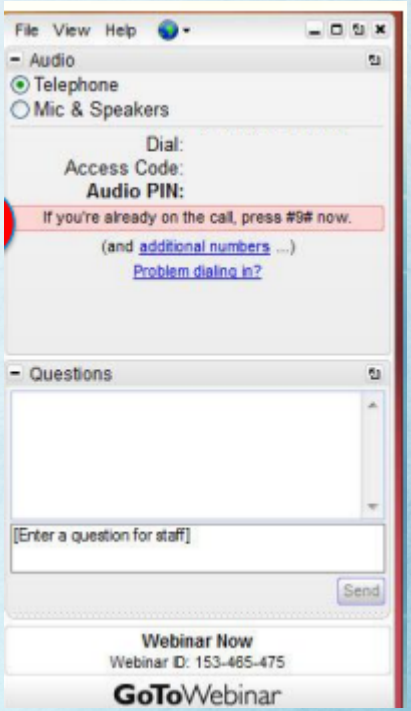
February 15, 2022
9 am to 11 am

Workshop and Program Materials

- Workshop is being recorded, recording will be posted later
- Slides will be available after the webinar on the EVSE Standards: Meetings & Workshops page
- Subscribe to the Electric Vehicle Charging Station Open Access email list for updates on website postings

Workshop Questions

- All attendees will remain muted for the presentation
- Questions can be sent via the GoToWebinar question box
  - Please include slide numbers
- Please raise your hand if you would like to ask a question at the end
- Additional questions may be submitted after today to: stephanie.palmer@arb.ca.gov



Staff Introductions

- Joshua Cunningham – Opening Comments
- Stephanie Palmer – Presenter
- Adrienne Harris – Q & A Moderator / Technical Assistance

Agenda

- Technology Review Scope and Methods
- Findings
- Recommendations
- Next Steps
- Public Comment

Context and Background

- Enabling Legislation SB 454 Electric Vehicle Charging Stations Open Access Act Signed in 2013
- CARB Board adopted regulation June 27, 2019
- EVSE Standards Regulation Effective July 1, 2020

Questions Addressed in Tech Review

1. What barriers do drivers experience when they attempt to access charging?
2. What leads to drivers calling customer service to initiate a charge session?
3. How frequently are charging stations inoperable?
4. To what extent have credit card companies deployed EMV chip & tap cards?
5. What is the availability and use of EMV chip & tap by consumers?
6. What are EVSE up and down time and does that affect the needs of drivers?

Methods

- Ongoing stakeholder engagement after 2019
  - Public Webinar, October 2020
  - Numerous informal engagement meetings
- Literature and data review
  - FDIC and financial industry reports about banking
  - AFDC and other EVSE data trends
- Conducted surveys of Electric Vehicle Service Providers, Credit Card Companies, and Drivers

Findings

1. Inoperable stations and payment issues are barriers for drivers.
2. Membership requirements may be a perceived barrier for drivers.
3. Multiple payment methods exist on chargers today, but most EVSPs rely on contactless tap methods of payments.
4. Tap-enabled cards represent a small segment of cards in use today nationally, but deployment is accelerating.
   - Lower-income survey respondents are somewhat less likely to have tap;
   - CARB lacks detailed data on distribution of these cards across CA
5. Tap has the potential to expand payment options for under and unbanked drivers, but barriers remain.

1) Inoperable stations and payment issues are barriers to drivers

Barriers to Using Public Charging	# of Drivers
Membership requirements	575
Charging station operability issues	439
Too Expensive	224
Payment Issues	209
Too complicated	164
Finding Charging Stations	121
Lack of Charging Station Availability	39
Declined to State	35
Cell Service/Wi-Fi Availability	2

Most common response is related to payment or inoperable station

CARB

1) Inoperable stations and payment issues are barriers to drivers

70% of responses (top 3) related to inoperable stations

20% indicated payment challenges

Reasons for Contacting Customer Service	Number of Drivers
1. Charging station unit not working	261
2. Vehicle connector on charging station was broken	105
3. Charging station shut off during charging session	69
4. No way to pay with my credit card on charging station	66
5. Not a member of the network	45
6. Insufficient cell service to download mobile app	35
7. Billing and Payment Issues	10
8. Technical Issues	5
9. Membership Issues	6
10. Cell Service	1
11. Assistance with Charging Station	7
12. General Assistance	3
13. File a complaint	1
14. Miscellaneous Statement	1
15. Declined to state	2
Total	617

CARB

2) Membership requirements may be a perceived barrier to drivers

- 76% drivers said they had a membership
- 2/3rds of these said they needed one to access station
- 62% of drivers indicated they have 2-5 memberships

Primary Reasons for Creating a Charging Network Membership	Number of Drivers
It was the only way to access the charging station	388
I was driving out of my home area and needed to prep for public charging	117
My vehicle came with free charging	24
No on-site credit card payment available	19
Membership Advantages	25
Other Reasons	6
Miscellaneous Comments	1
Declined to State	4

CARB

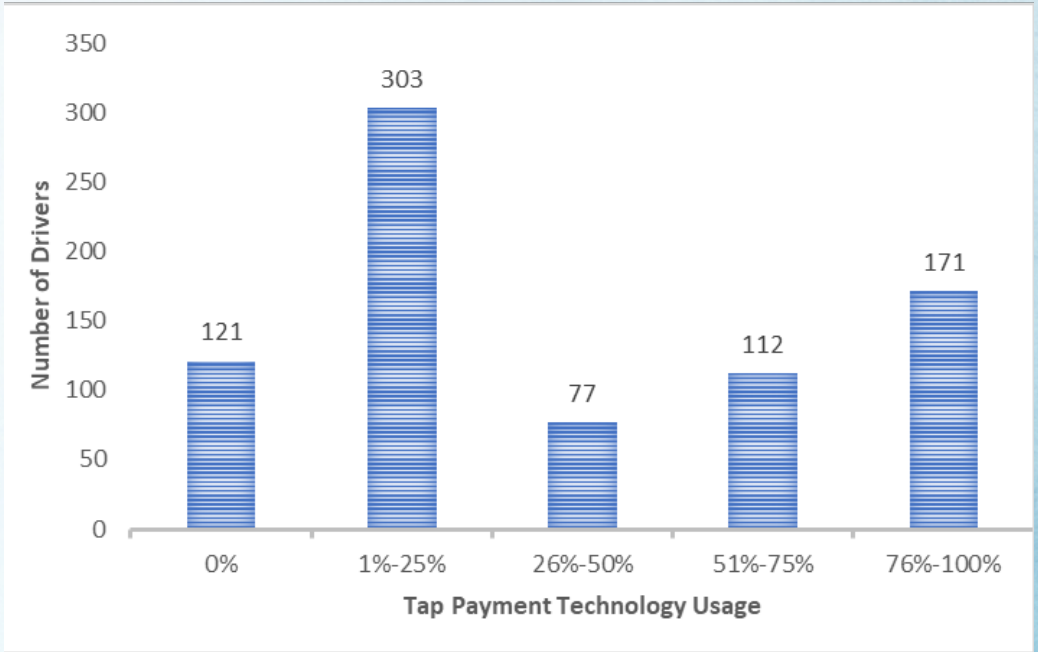
3) Multiple payment methods exist, but most EVSPs rely on contactless tap

All contactless tap options rely on one hardware system – the NFC Reader; a risk if this hardware is inoperable

Payment Hardware	Charge-Point	EnelX	Flo	Greenlots	EVgo	Rivian	Tesla	Volta
1-800	X	X	X	X	X	-	X	-
EMV chip	X*	X	-	X*	X*	-	-	-
NFC card **	X	X	X	-	X*	-	-	-
NFC mobile phone (mobile wallet)	X	X	X	-	X*	-	-	-
EVSP mobile app	X	X	-	X	X	X*	X	X*
EVSP RFID Card	X	X	X	X*	X	-	-	-
Cash	-	-	-	-	-	-	-	-
Mag swipe	-	X	-	X*	X*	-	-	-
Plug-N-Charge (ISO 15118)	X	-	-	X*	-	-	-	-
Other	Wex / Voyager	QR Code	-	-	-	-	Plug and Charge (proprietary communication protocol)	-

4) Tap cards are a small segment of cards today. Deployment is accelerating.

- Visa indicates tap is 15% of their national market share
- Mastercard estimates 25% within two years nationally
- Drivers indicate they do not always use the card payment technology



CARB

4) Lower-income survey respondents are somewhat less likely to have tap

- 79% of PEV drivers above $50,000 have tap cards
- 57% of PEV drivers below $50,000 have tap cards
- CARB lacks detailed data on the broader distribution of these cards among Californians generally

Card Type	Drivers with income ABOVE $50,000		Drivers with income BELOW $50,000	
	Number of Drivers	Percentage of Drivers	Number of Drivers	Percentage of Drivers
Tap and EMV	351	52.62%	173	35.82%
Only tap	181	27.14%	100	20.70%
Only EMV	64	9.60%	71	14.70%
Do not own any cards	56	8.40%	116	24.02%
Unsure of card type	19	2.25%	23	4.76%
Totals	671	100%	483	100%

CARB

5) Tap has the potential to expand payment options for under and unbanked drivers, but barriers remain

- FDIC study, minimum balance requirements keep households unbanked
- P2P mobile applications give access to better banking options
- Not having a smartphone with contactless payment is a barrier to charging in public

Smartphone Type	Drivers with income ABOVE $50,000		Drivers with income BELOW $50,000	
	Number of Drivers	Percentage of Drivers	Number of Drivers	Percentage of Drivers
Smartphone WITH contactless payment	585	87.2%	322	66.7%
Smartphone WITHOUT contactless payment	79	11.8%	142	29.4%
Has a smartphone does not know if it has contactless payment	5	.7%	2	.4%
Does not own a smartphone	2	.3%	17	3.5%
Totals	671	100%	483	100%

CARB

Recommendations

1. Revisit the EMV chip requirement in the EVSE Standards when tap technologies are more broadly available in CA
2. Conduct ongoing monitoring of public charging market trends, including use of payment technologies
3. Continue to evaluate barriers to charging for all users
4. Develop metrics and a process for tracking station up/downtime
5. Consider a study or pilot to evaluate how people, esp. low-income, pay for trans. services, including public EV charging

Next Steps

- Staff to consider public comments
- Board to consider recommendations in April 2022
- Staff monitoring compliance with current EVSE reg
- If EVSE Reg changes are requested, new rulemaking will need to occur

Written Comments

- Written comments may be submitted for the Technology Review by February 28th using the informal comment submittal form
- View written comments.
- Slides will be posted on program page in the coming days

Workshop Question & Discussion

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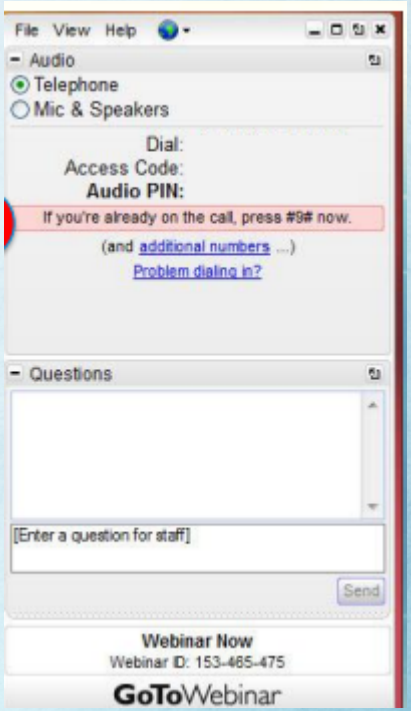

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