

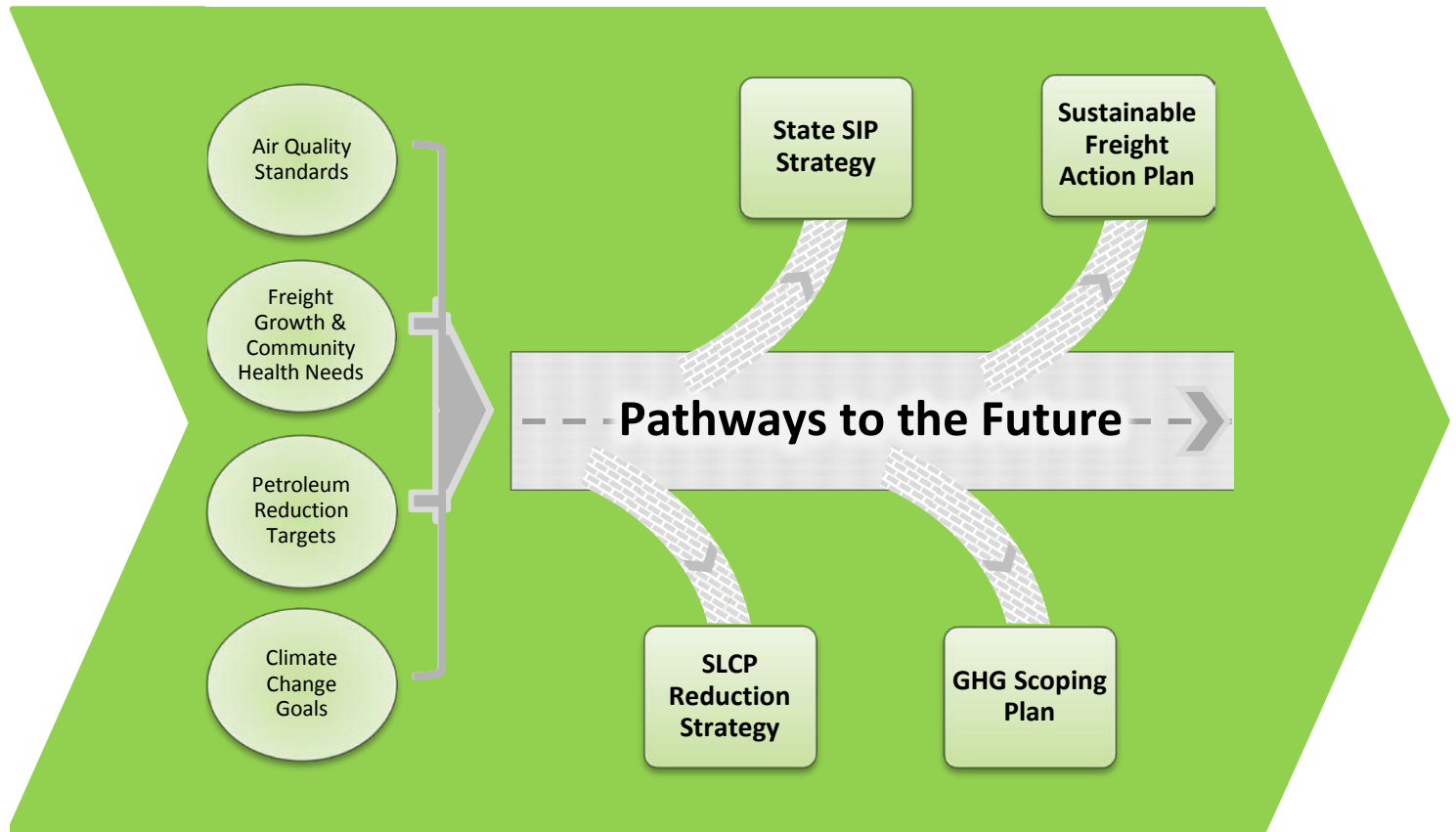
# Public Workshop for Zero-Emission Airport Shuttle Bus

February 22, 2017  
Sacramento, California  
1:00 pm – 3:00 pm

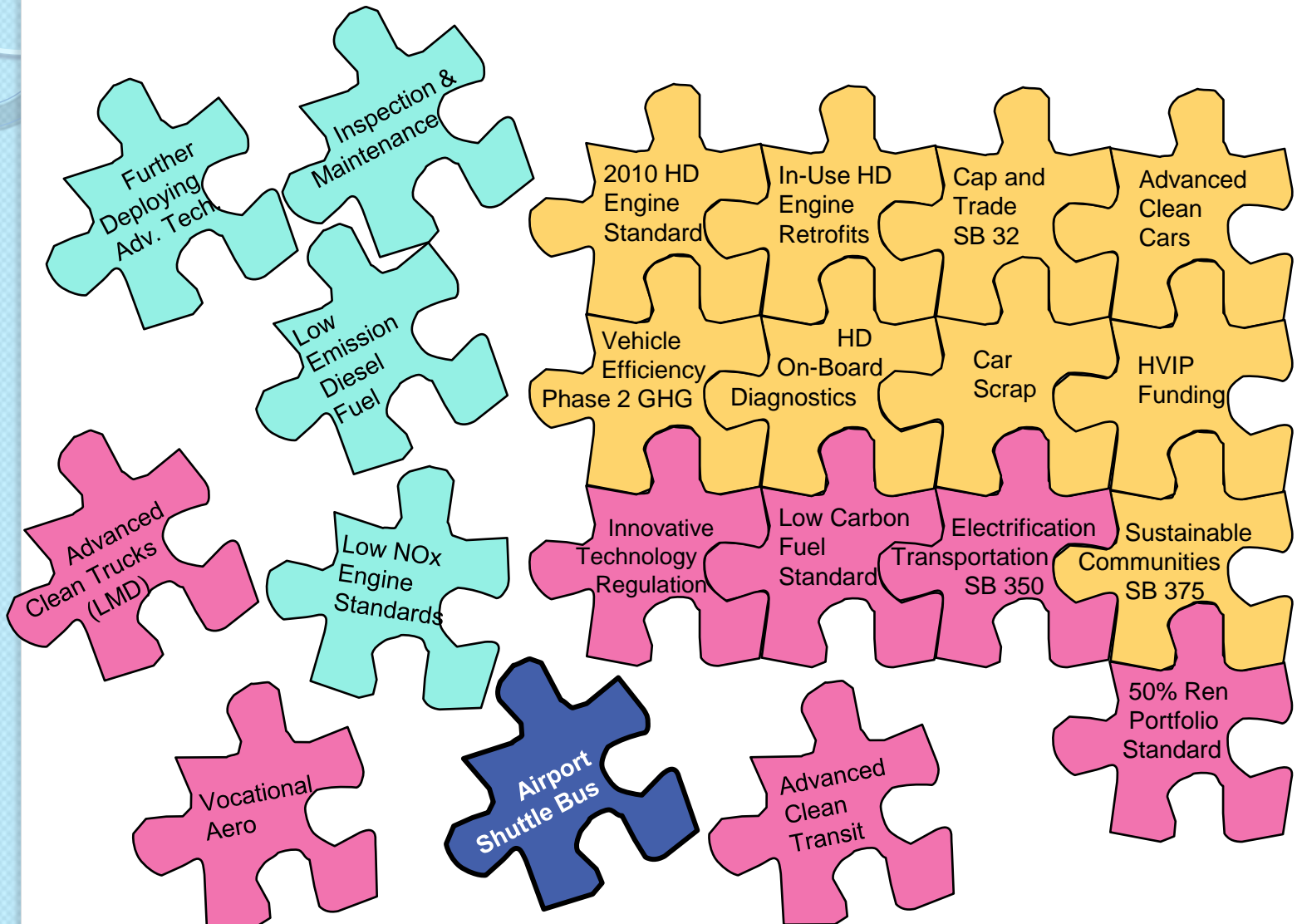


California Environmental Protection Agency  
 **Air Resources Board**

# Multiple Air Quality Planning Efforts



# Mobile Source Strategies



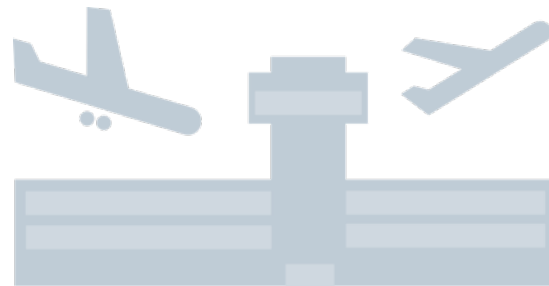
# Zero-Emission Airport Shuttle Bus Measure – Goals

1. Complement existing programs to achieve NO<sub>x</sub> and GHG emission reductions through use of zero-emission technology.
2. Increase the penetration of the first wave of zero-emission heavy-duty technology

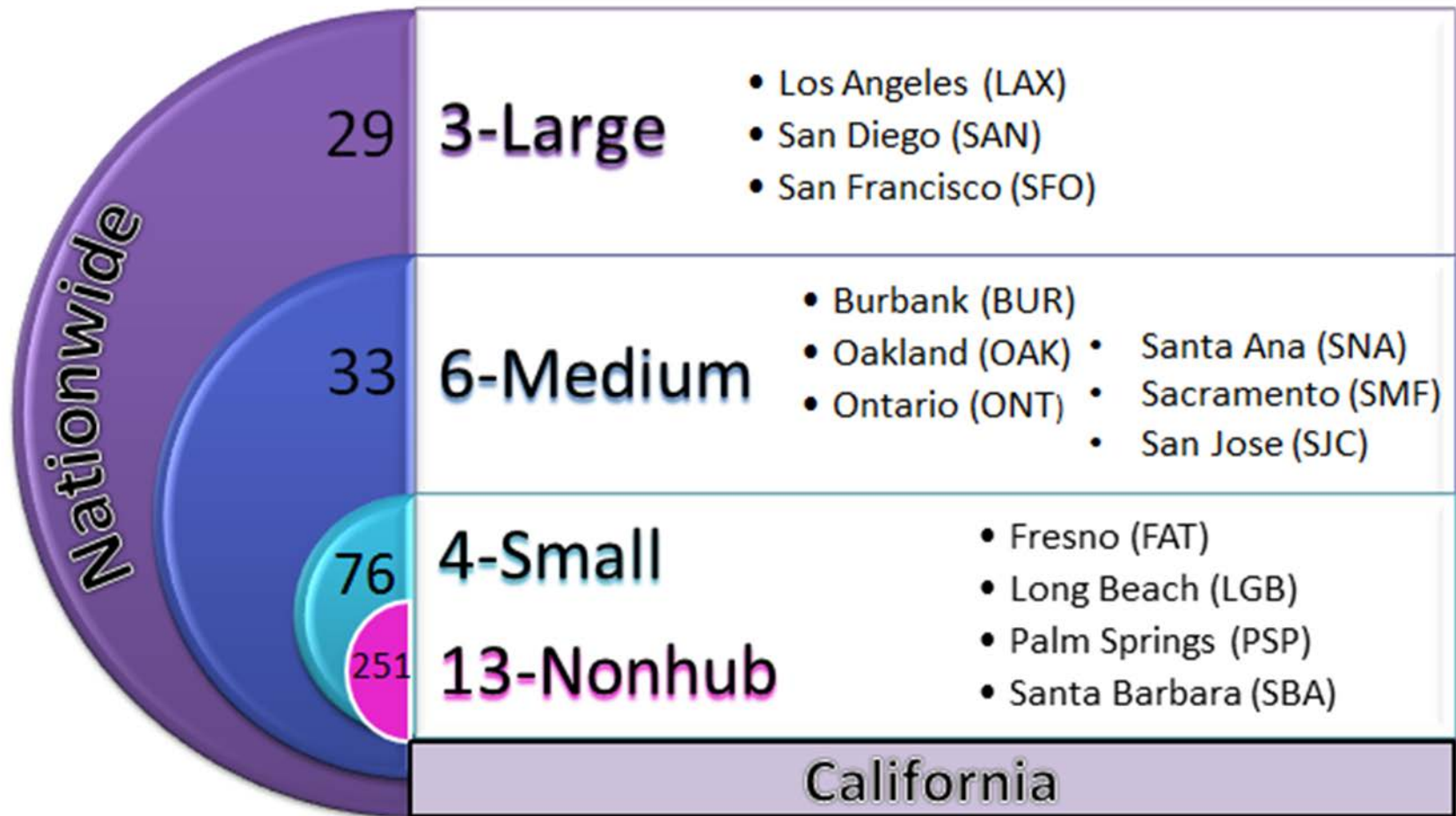
-- *Mobile Source Strategy, May 2016*

# Airports: Key Contributors in California

- 5% of California's GDP
- 34 commercial airports in State
- Commitments to model environmental practices and reducing air pollution



# Primary Airports in California



# What we have learned



- Most airport shuttles operate at the nine largest California airports
- Most fleets fueled by CNG
- Modal transportation changes impact airports (e.g., loss of parking fee revenue)
- FAA provides grants for projects that reduce air pollutants

# Current California Airport Efforts

- Walkable access to rental car facility  
BUR, SNA, SJC
- Electric rail to rental car facility  
SFO, LAX - *planned*
- Increased transit access to airports  
SFO, OAK, SAN, SJC, SMF, SNA, ONT, BUR
- Cleaner vehicle encouragement programs  
SFO, SAN
- Applying for FAA Grants  
SMF, OAK, SJC





# Airports Tapping into Zero-Emission Shuttles

Airport	Battery Electric Buses
Hartfield-Jackson Atlanta International Airport (ATL)	2
Kansas City International Airport (MCI)	4
Indianapolis International Airport (IND)	6
Sydney International Airport (SYD), Australia	46
Amsterdam Airport Schiphol (AMS), Netherlands	35

# International Efforts focused on Transportation to Airports

Airport	Scope	Effort
Hamburg International Airport (HAM), Germany	Public Transit – Passengers to Airports	City goal: Transit fleet be 100% Zero-Emission by 2020
Haneda International Airport (HND), Japan	Employee Shuttle	Field testing airport battery electric shuttle between airway facilities and airport
Geneva International Airport (GVA), Switzerland	Public Transit – Passengers to Airports	Battery electric bus fleet serving 10,000 passengers daily between suburbs and airport

# Linking with Other Efforts

- Utilities removing barriers to transportation electrification (SB 350)
- University of California commitment to net zero GHG emissions by 2025



# Zero-Emission Manufacturers



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**NEW FLYER**

**nohm**<sup>™</sup>  
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PROPULSION SYSTEMS

**ZENITH**  
MOTORS

**ADOMANI**

**MOTIV**

**BYD**

**GP** GreenPower Bus  
*The Future of Public Transportation*

**US Hybrid**

# Best Applications for Zero-Emission Vehicles at Airports

- Operational characteristics:
  - Fixed route
  - Low-mileage
  - Stop and go operation
  - Low average speeds
  - Centrally maintained and fueled
- Complement not replace public and active transportation

# How will we meet our goals?

- What incentives are available?
- What is the best mechanism: regulations, incentives, and/or voluntary agreements for this measure?
- Should scope capture other vehicles entering and exiting airports? Airport vehicles?

# Potential Cost Share Sources

Funding Source	Type	Project
LCTI/AQIP	State	Equipment
CEC ARFVTP	State	Equipment/Infrastructure
Carl Moyer	State/Local	Equipment
FAA VALE ZEV Pilot	Federal	Equipment/Infrastructure
ARB	SEP	Proposal needed: Equipment/infrastructure
Local District	Penalty, AB 923, AB 2766	Equipment/Infrastructure
Utilities (SB 350)	Utility Investments	Infrastructure/Rates

# Next Steps

- Form working group
- Determine measure scope
- Collect and analyze data
- Develop proposal in partnership



ARB Board Hearing 2018



# Comments and Discussion

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# Additional Comments or Questions

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**Web Page:** <https://www.arb.ca.gov/msprog/asb/asb.htm>

***Sign up for the Airport Shuttle Bus list-serve to receive updates!***