

# Concepts to Reduce Emissions from Locomotives and Railyards



# Meeting Agenda

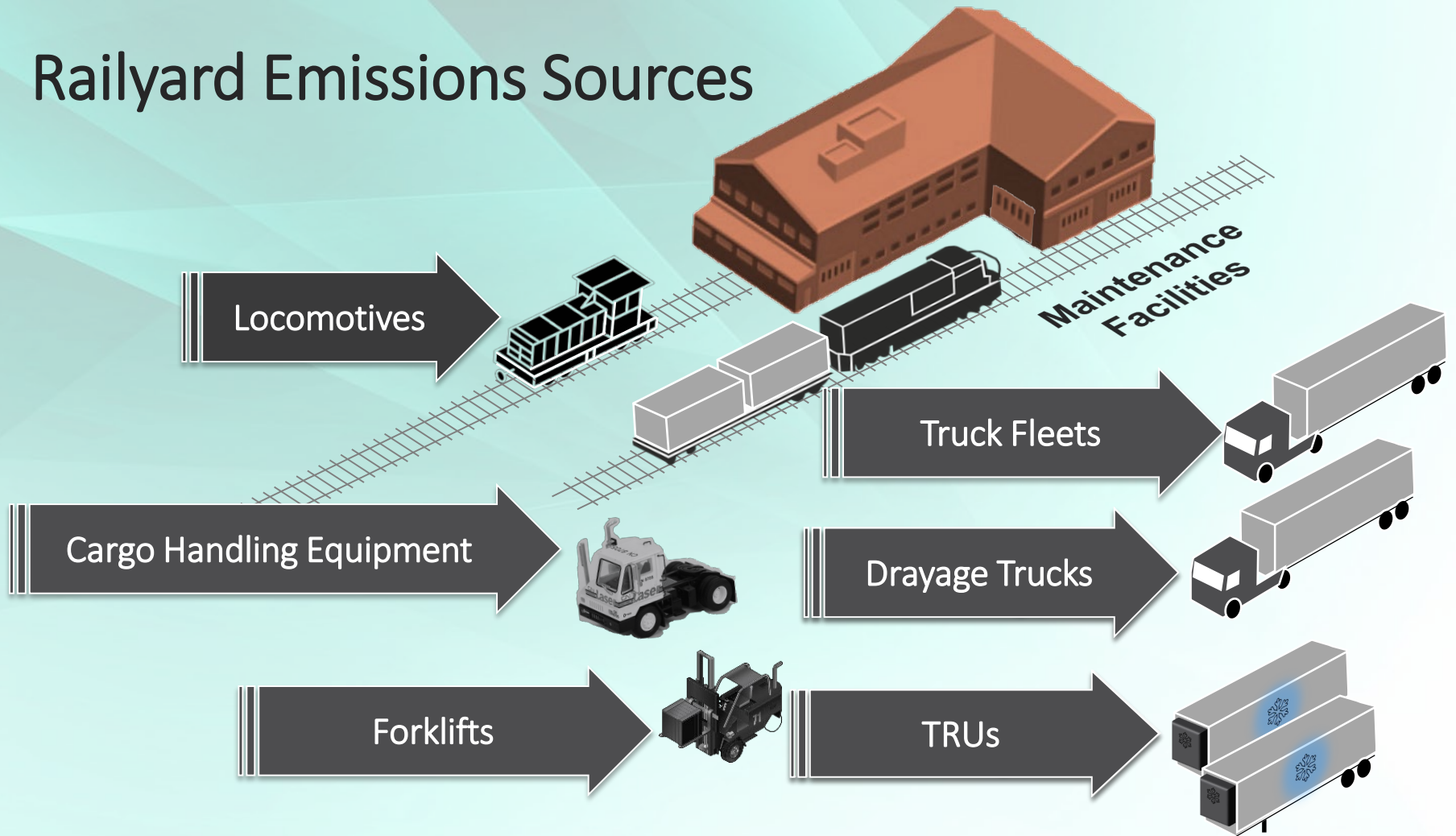
- Introductions
- Background
- CARB Concepts
- South Coast Concepts
- Questions



# What do we need to minimize the community health impacts from locomotives?

- Engaged community partners
- Industry leadership
- Coordinated state and local government actions
- Multi-year incentive funding
- More stringent national standards

# Railyard Emissions Sources



# Line Haul Locomotives



- Large, high horsepower
- Travel throughout country
- Difficult to incentivize



# Switchers

- Small, lower horsepower
- Typically older
- Generally stay local
- State incentives available



# CARB Background on Rail

## **1998 South Coast Agreement (sunset 2030)**

- Average Tier 2 NOx emissions standard
- Railroads report activity
- Credits provided for early technology adoption

## **2005 Statewide Railyard Agreement (sunset 2015)**

- Idle reduction, repair and reporting effort
- Use of cleaner diesel fuel
- 17 railyard health risk assessments

# South Coast AQMD – Rail Activities

- **2017**

South Coast AQMD Board directed staff to develop a draft Indirect Source regulation on railyards, and explore voluntary approaches

- **2018/2019**

Staff collected emission inventory information from UP/ BNSF

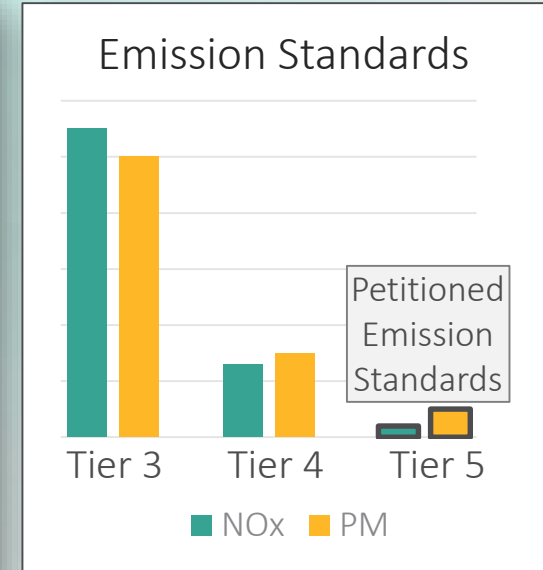
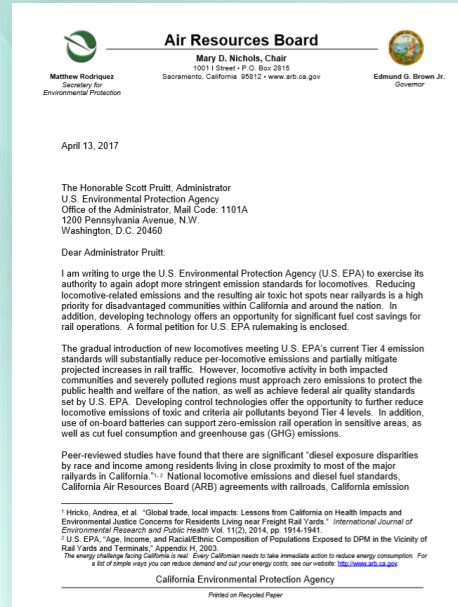
- **2019**

All three year-1 AB617 communities identified railyards as a top priority (Commerce/E. LA, Wilmington/West Long Beach/Carson, San Bernardino)

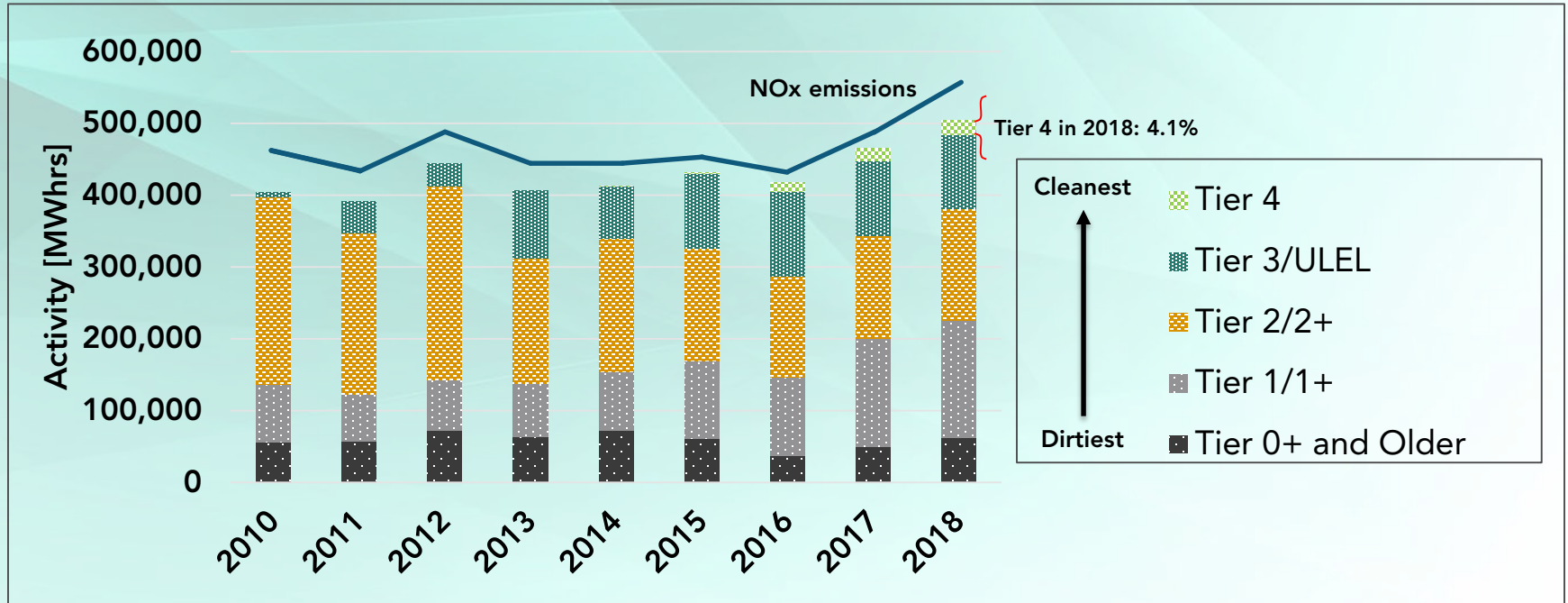


# State of Locomotive Technology

- Tier 4 (2015)
- Locomotive Petition to U.S. EPA
- Currently Demonstrating Batteries on Locomotives



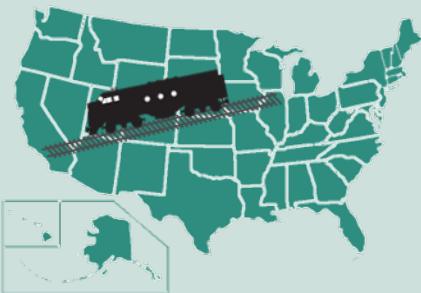
# Locomotive Emissions in the South Coast



# Who Can do What?

## Federal: U.S. Environmental Protection Agency

- Regulate locomotive emissions standards
- Stationary and Mobile Source Authority



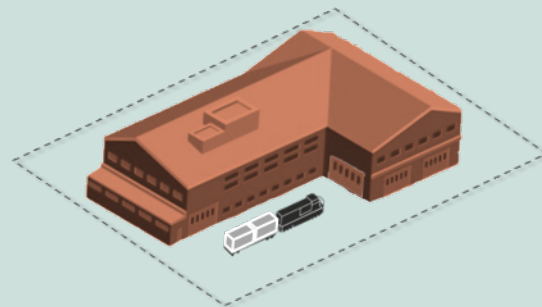
## State: California Air Resources Board (CARB)

- Regulate locomotive activity
- Primarily Mobile Source Authority



## Local: Air Quality Management Districts (SCAQMD)

- Regulate railyard emissions
- Primarily Stationary and Indirect Source Authority



# CARB Statewide Concepts

1

Establish a Locomotive Emissions Reduction Spending Account

2

In-Use Locomotive Remanufacture Limit

3

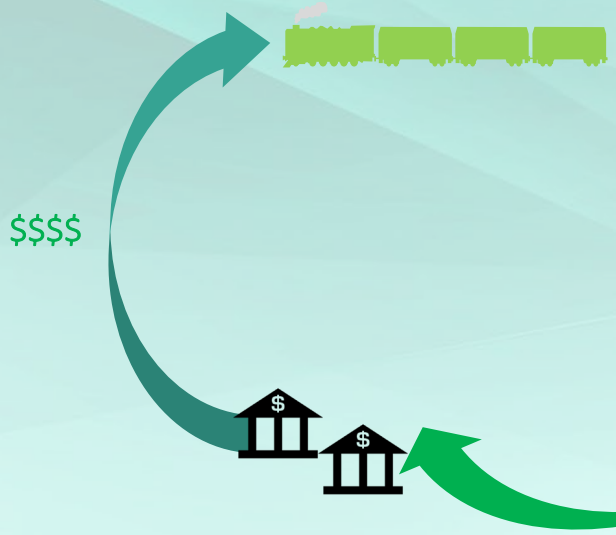
Adopt U.S. EPA 30 Minute Idling Limit

4

Genset Repurposing

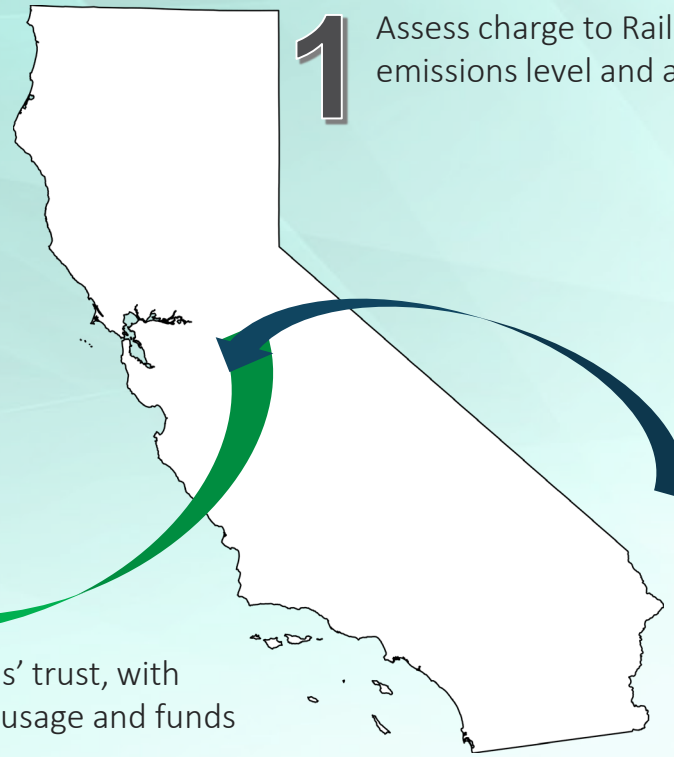
# 1. Establish a Locomotive Emissions Reduction Spending Account

**3** Railroad uses accumulated charges for cleaner locomotives, with reporting.

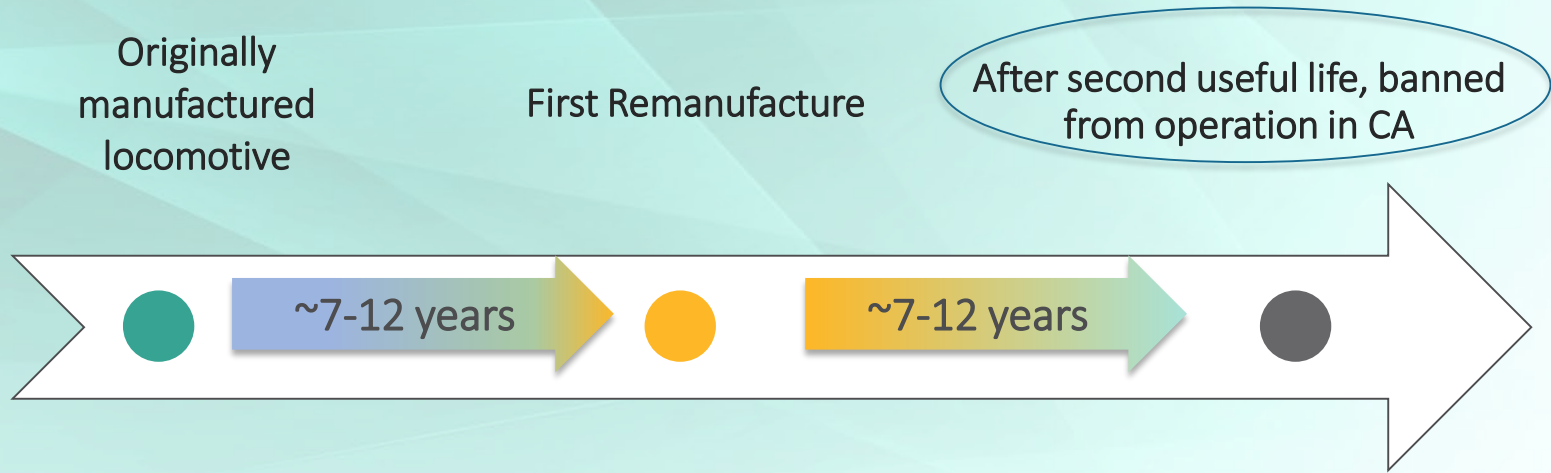


**2** Charges held in the individual Railroads' trust, with annual public reporting of locomotive usage and funds deposited.

**1** Assess charge to Railroads for locomotives based on emissions level and amount of work performed in CA.



## 2. In-Use Locomotive Remanufacture Limit



- Railroads currently have no limit how many times they can remanufacture
  - Remanufacture only needs to be as-built or “plus” standard
- When implemented, any locomotive already remanufactured more than once would be banned from California
  - Alternative: remanufacture to Tier 4 and continue California operation

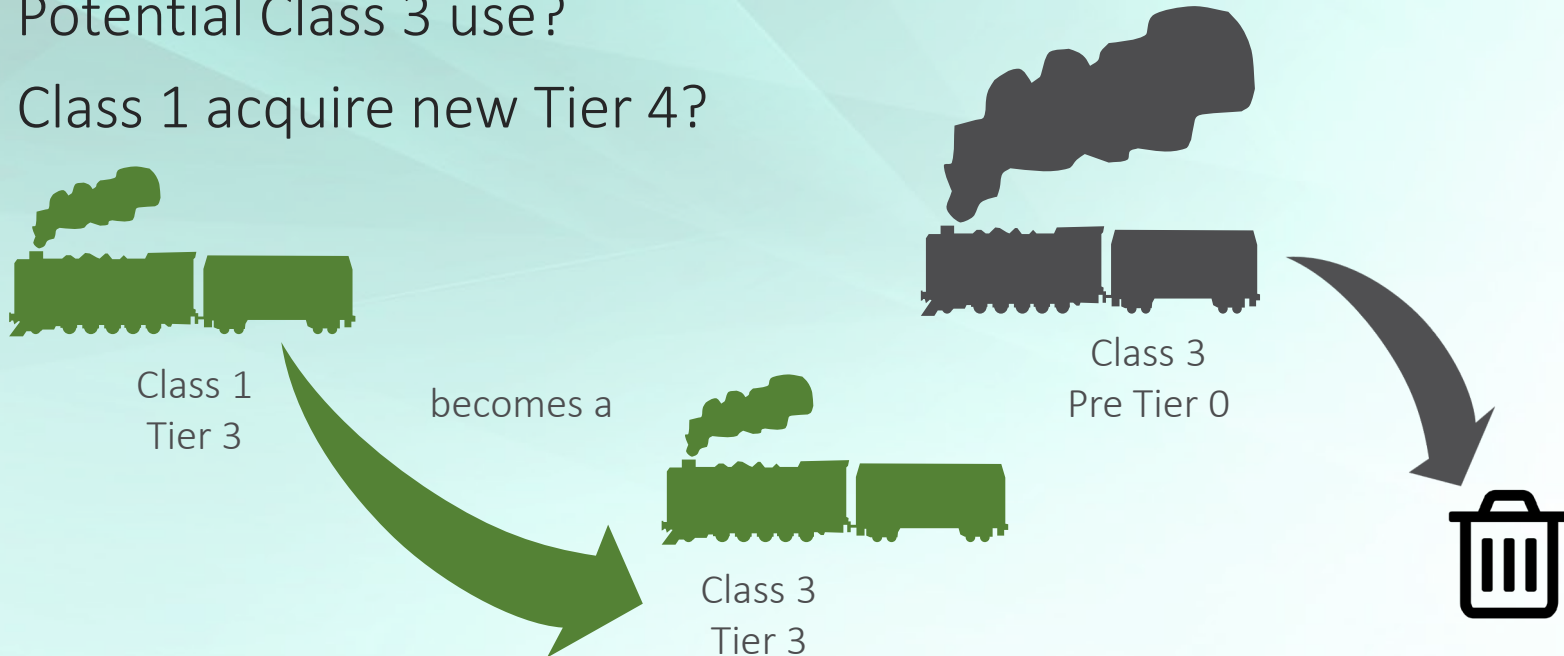
### 3. Adopt U.S. EPA 30 Minute Idling Limit

- Incorporates Federal requirements in California SIP
- Makes the rule CARB enforceable
- Enforcement by Air Districts possible through enforcement MOU



## 4. Genset Repurposing

- Tier 3 generator sets not fit for Class 1 use
- Class 3 operating much older, lower use locomotives
- Potential Class 3 use?
- Class 1 acquire new Tier 4?





# South Coast AQMD Concepts

**1**

Indirect Source Rule (ISR) to Reduce Exposures from Locomotive Maintenance and Service Emissions

**2**

ISR to Require Engineering Plans for Zero Emissions Operations

**3**

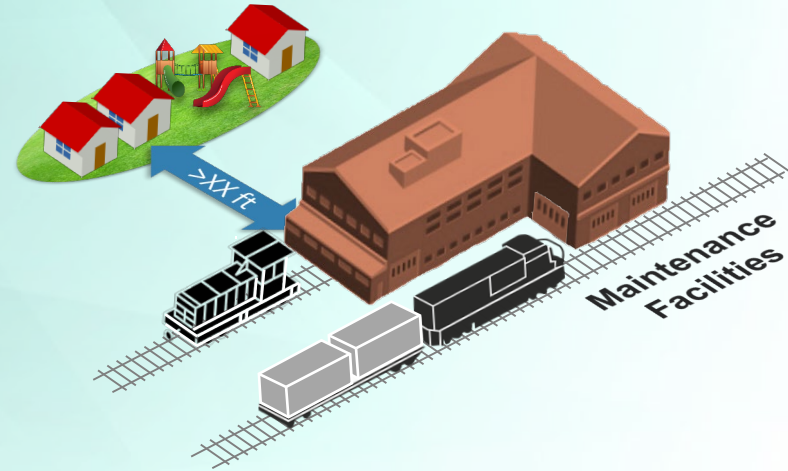
New Incentive Program Focused on Cleanest Locomotive Use

**4**

Evaluate New Monitoring Approaches for In-Use Locomotives

# 1. Reduce Exposures from Locomotive Maintenance and Service Emissions

- Community has placed high priority on reducing exposure from locomotive maintenance
- In the past, the railroads have stated that >10,000 maintenance and service events per year have occurred at some railyards
  - Load testing and idling can have high emissions

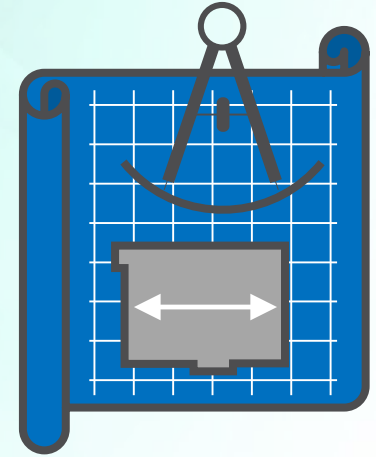


## Proposed ISR Requirements

- Minimum distances to sensitive receptors (buffer)
- Install/Use emission control equipment
- Schedule maintenance activities to reduce impacts

## 2. Engineering Plans for Zero Emissions Operations

- Community priority on zero emission on-site equipment
- For transition to Zero Emissions operations, significant infrastructure upgrades are needed
  - Land, electrical equipment, site-specific engineering, etc.
- Coordination with local utilities is critical



Proposed ISR  
Requirements

- Railroads prepare site-specific Zero Emissions Plans
- South Coast AQMD and CARB would evaluate plans to identify next steps (regulations, incentives, etc.)

# 3. New Incentive Program Focused on Cleanest Locomotive Use

- Current incentive programs have limited effectiveness in accelerating the widespread use of the cleanest locomotives (Tier 4)
  - Programs require in-state use and replacement
- Railroads have shown that preferential routing is possible with 1998 MOU Tier 2 requirement
- Attract cleanest existing locomotives now
  - Faster possible emission reductions than regulations
- Potentially funded by Railroads through proposed CARB spending account

*South Coast AQMD  
funded 19 freight  
locomotives since 2016  
(~\$37 million total)*

Potential  
Approach

- Develop new local program that provides incentives tied to clean locomotive use, not replacement
- Increased incentives in disadvantaged communities

# 4. Evaluate New Monitoring Approaches for In-Use Locomotives

- South Coast AQMD continues to receive air quality complaints about smoking locomotives
  - We pass along the complaint to the railroads
  - EPA sets emissions standards, but only requires in-use testing for up to five locomotives per railroad per year
- Better data on local air quality impacts of smoking locomotives can lead to follow-up actions/ priorities

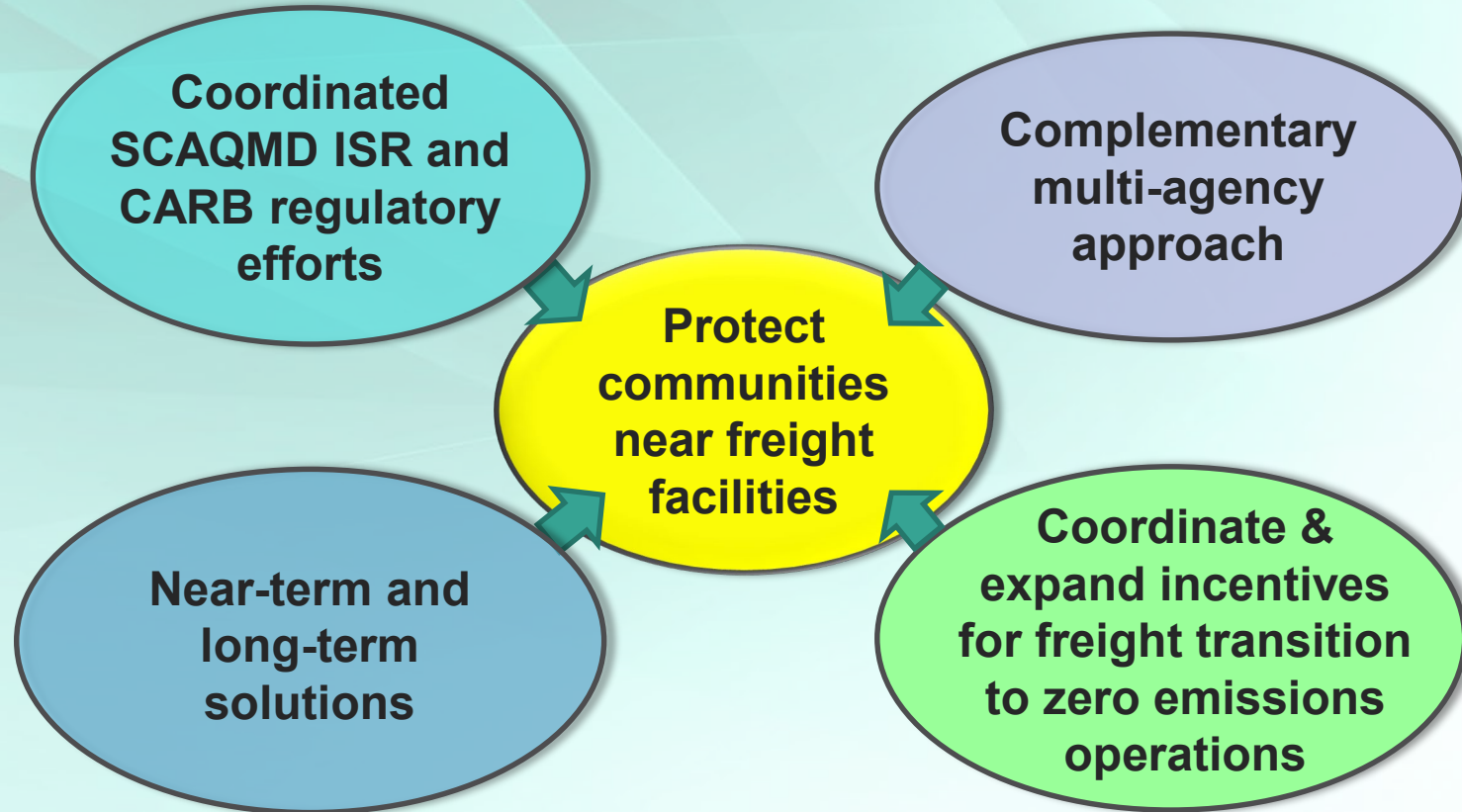


Potential  
Approach

→ Evaluate new monitoring technologies to document air quality impacts

→ Use data to support follow-up regulatory or enforcement actions to reduce emissions

# Path Forward on Freight



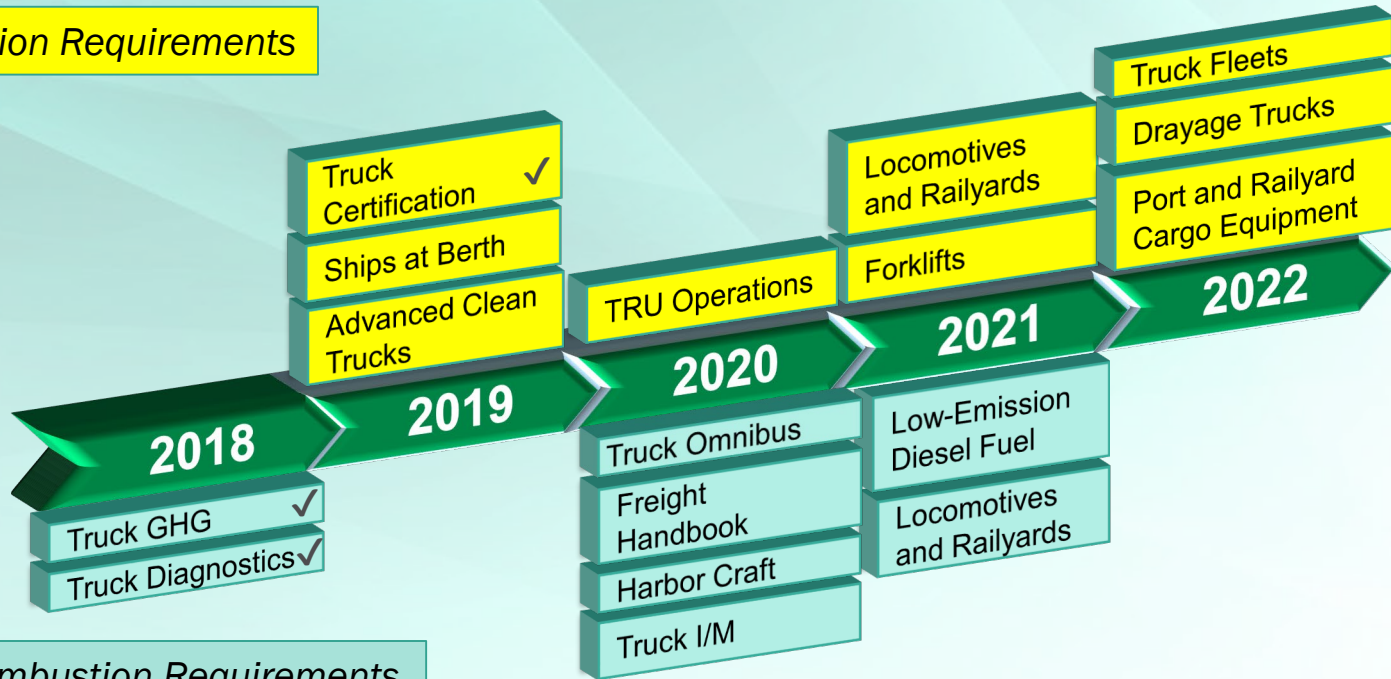
# Next Steps

- Continue to reach out to stakeholders to develop concepts
- Continue to South Coast AQMD/CARB partnership
- CARB to hold additional workshops statewide
  - Additional opportunities for public input will be available throughout rulemaking process
- South Coast AQMD Board considers Indirect Source Rule in December 2020
- Air Resources Board considers locomotive rules in 2021

# New CARB Freight Actions

(1<sup>st</sup> Board hearing dates shown)

## Zero Emission Requirements



## Cleaner Combustion Requirements





# Stakeholder Feedback



- CARB Freight Team  
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