Fiscal Year 2017-18 Funding Plan for Clean Transportation Incentives

Public Workshop
Sacramento, California
October 4, 2017

Workshop Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:30 am – 10 am</td>
<td>Introduction and Overview of Project Category Funding Allocations</td>
</tr>
<tr>
<td>10:00 am – Noon</td>
<td>Light-Duty Vehicle and Transportation Equity Investments</td>
</tr>
<tr>
<td>Noon – 1 pm</td>
<td>Lunch Break</td>
</tr>
<tr>
<td>1 pm – 4:00 pm</td>
<td>Heavy-Duty Vehicle and Off-Road Investments</td>
</tr>
<tr>
<td>4:00 pm – 4:30 pm</td>
<td>Additional Discussion (if necessary)</td>
</tr>
</tbody>
</table>
Session 1: Introduction and Overview of Funding Allocations

Funding Plan Development Progress

- Kickoff workshop in February
- 15 work group meetings – February through June
- Final funding approved in budget – September 15
- Draft Funding Plan released – Last week
- Today’s workshop
  - Release proposed Funding Plan for 30-day public comment period – October 13
  - Board considers Funding Plan – November 16-17
### $663 Million from Four Separate Sources in Funding Plan

<table>
<thead>
<tr>
<th>Amount</th>
<th>Program Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$560 million</td>
<td>Low Carbon Transportation Program funded with Cap-and-Trade Auction Proceeds</td>
</tr>
<tr>
<td>$28 million</td>
<td>Air Quality Improvement Program (AQIP)</td>
</tr>
<tr>
<td>$25 million</td>
<td>Volkswagen Settlement for ZEV Aspects of Vehicle Replacement Programs <em>(one-time funding)</em></td>
</tr>
<tr>
<td>$50 million</td>
<td>Zero/Near Zero-Emission Warehouse Program <em>(one-time funding)</em></td>
</tr>
</tbody>
</table>

### Other New Programs to be Developed Through Separate Public Processes

<table>
<thead>
<tr>
<th>Amount</th>
<th>Program Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$250 million</td>
<td>New community emission reduction incentive program to support AB 617 <em>(established in September budget bill)</em></td>
</tr>
<tr>
<td>$135 million</td>
<td>New agricultural equipment incentive program <em>(established in September budget bill)</em></td>
</tr>
<tr>
<td>$423 million</td>
<td>Volkswagen NOx Mitigation Trust - Kickoff workshop October 9</td>
</tr>
</tbody>
</table>

- **Not covered** in today’s workshop
- Public process for each to launch soon
- CARB will coordinate investment strategy among all its incentive programs
A Closer Look at Each Funding Source Covered in Plan…

Low Carbon Transportation Budget Appropriation

• $140 million for CVRP
  – Continues income limits set by Legislature
  – Directs CARB to work with Labor and Workforce Development Agency

• $100 million for transportation equity projects
  – For EFMP Plus-up, school bus replacement, CVRP rebates for low-income applicants, and SB 1275 projects
Low Carbon Transportation Budget Appropriation (cont.)

• $180 million for clean truck and bus vouchers through HVIP
  – Directs CARB to consider forthcoming technological innovations and market demand in designing program
  – Reserves at least $35 million for zero-emission buses

• $140 million for advanced freight equipment demonstration and development
  – Includes ships at berth
  – Prohibits funding fully automated cargo handling

AQIP

• $28.64 million for criteria pollutant and toxics focused mobile source projects
  – Staff proposes allocating $28 million to projects, with $0.64 million as reserve for budget uncertainty

• Focus on projects that don’t fit under Low Carbon Transportation
Volkswagen Settlement Funds for Car Scrap and Replace

- As part of one of the multiple consent decrees, Volkswagen must pay CARB $25 million to fund ZEV-related aspects of vehicle replacement

- Legislature provided additional direction in budget
  - Support expansion of EFMP Plus-up statewide
  - Develop tool to improve efficiency and verify eligibility
  - Increase community outreach

Zero/Near Zero-Emission Warehouse Program

- One-time $50 million appropriation, with following direction:
  - Award funding competitively with 1:1 non-state match
  - Develop as part of Funding Plan
- Staff will coordinate with Low Carbon Transportation freight funding
**Investment Priorities for 2017-18**

- Support strategies in CARB’s climate change and air quality plans to meet long-term goals
  - Transform fleet to zero and near-zero emitting
  - Align with priorities in Cap-and-Trade reauthorization bill and direction in budget bills
- Maximize disadvantaged community benefits and support SB 350 study
- Consistent with long-term plan for light-duty and 3-year strategy for heavy-duty investments
- Coordinate with other funding sources

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**Recommended Project Allocations:**

**Light-Duty Vehicles and Transportation Equity**

<table>
<thead>
<tr>
<th>Project Category</th>
<th>Allocation (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CVRP (standard rebates)</td>
<td>$140</td>
</tr>
<tr>
<td><strong>Transportation Equity Projects</strong></td>
<td></td>
</tr>
<tr>
<td>EFMP Plus-Up</td>
<td>$20</td>
</tr>
<tr>
<td>Financing Assistance</td>
<td>$20</td>
</tr>
<tr>
<td>Car Sharing and Agricultural Worker Vanpools</td>
<td>$20</td>
</tr>
<tr>
<td>Rural School Bus Pilot</td>
<td>$10</td>
</tr>
<tr>
<td>CVRP Rebates for Low-Income Applicants</td>
<td>$40</td>
</tr>
<tr>
<td>One-Stop-Shop for Equity ZEV Incentives <em>(new)</em></td>
<td>$5</td>
</tr>
<tr>
<td>To Be Allocated Based on Demand</td>
<td>$10</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$265</strong></td>
</tr>
</tbody>
</table>

In addition to $80 million in equity funding from past years remaining to be spent
Recommended Project Allocations: Heavy-Duty Vehicles and Off-Road Equipment

<table>
<thead>
<tr>
<th>Project Category</th>
<th>Allocation (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Freight Equipment and Facilities</td>
<td></td>
</tr>
<tr>
<td>Zero/Near Zero-Emission Freight Facilities (incl warehouses) (new)</td>
<td>$150</td>
</tr>
<tr>
<td>Zero-Emission Off-Road Freight Voucher Incentive Project (new)</td>
<td>$40</td>
</tr>
<tr>
<td>Clean Truck and Bus Vouchers (HVIP and Low NOx Engines)</td>
<td>$188</td>
</tr>
<tr>
<td>Truck Loan Assistance Program</td>
<td>$20</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$398</td>
</tr>
</tbody>
</table>

AB 1550 Disadvantaged Community and Low-Income Investment Targets

- Staff recommends at least 45 percent of Low Carbon Transportation funds meet AB 1550 criteria
  - ≥35 percent in disadvantaged communities
  - ≥10 percent in low-income communities or for low-income households
- These are minimums, CARB will design projects to maximize benefits
- Staff expects to exceed these targets
- Staff will design non-GGRF programs to benefit AB1550 populations as well
## Investments Support Multiple Policy Goals

<table>
<thead>
<tr>
<th>Project Categories</th>
<th>Climate Change Scoping Plan</th>
<th>Short-Lived Climate Pollutants</th>
<th>Ozone &amp; PM SIPs</th>
<th>Sustainable Freight</th>
<th>Air Toxics</th>
<th>Petroleum Reduction</th>
<th>Disadvantaged &amp; Low Income Communities</th>
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</thead>
<tbody>
<tr>
<td>CVRP</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Transportation Equity Projects</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>Advanced Freight Equipment</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>HVIP - Clean Truck and Bus Vouchers</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Truck Loan Assistance</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

## Next Steps

- Request comments by October 9
- Post proposed Funding Plan for 30 day public comment on October 13
- Board considers Funding Plan at public meeting in Sacramento on November 15-16

Webcast email address:
sierrarm@calepa.ca.gov
Session 2:
Light-Duty Vehicle and Transportation Equity Investments

Clean Vehicle Rebate Project
Project Status

- Rebate demand and market continues to grow
- Waiting list established June 30, 2017
- Prioritizing rebates for low-income consumers
- Pre-qualification scheduled to launch late 2017/early 2018
- Outreach and education expanded

Assembly Bill 134 Direction

- Extends SB 859 requirements
  - Including income cap levels and increased rebates for low-income applicants

- Requires the Labor and Workforce Development Agency to develop certification procedures
  - CVRP eligible vehicles must be certified
  - Work with the Labor and Workforce Development
  - Any changes will be included in the FY 2018-19 Funding Plan
Draft Funding Allocation

- Proposing $180 million for CVRP
  - $140 million for standard CVRP rebates per AB 134
  - Propose $40 million of equity funding for CVRP low-income rebates

Projected Demand
Minor CVRP Modifications

• Eliminate CVRP eligibility for out of state vehicles

• Other considerations considered, but not recommended

Public Fleet Incentives

• Incorporate provisions unique to the pilot into CVRP

• Align increased incentives with incentives for low-income consumers
  – Limit increased incentives to vehicles domiciled in a disadvantaged community census tract
Public Fleet Incentives (cont.)

- California Department of General Services Procurement Process
  - Up to $1 million via an interagency agreement
  - Allows fleets access to incentives at the point of sale
  - Retain CVRP process for fleets who do not use DGS

Solicitation Process

- Grantee selected to administer FY 2016-17 CVRP and Public Fleet Pilot Project
  - Three-year solicitation with an option to enter into a new grant
  - Staff will evaluate the need for a new grant for FY 2017-18
Transportation Equity Investment Overview

• Light-duty equity pilot projects to increase access to clean transportation and mobility options in disadvantaged communities and lower-income households

Priorities for FY 2017-18

• Meet new AB 1550 disadvantaged community and low-income/household investment requirements
• Expand existing projects that show success
• Incorporate Volkswagen funding to expand EFMP Plus-up
• Incorporate recommendations in SB 350 Low-Income Barriers report
SB 350 Study
Priority Recommendations

- Expand funding for clean transportation and mobility options
- Simplify application process to increase access
- Increase awareness with One-Stop-Shop

Transportation Equity Funding
Current Status

<table>
<thead>
<tr>
<th>Project Categories</th>
<th>Funds Allocated (millions)</th>
<th>Funds Spent (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFMP Plus-up</td>
<td>$72</td>
<td>$12</td>
</tr>
<tr>
<td>Financing Assistance for Lower-Income Consumers</td>
<td>$6.9</td>
<td>$0.4</td>
</tr>
<tr>
<td>Clean Mobility Options for Disadvantaged Communities (Formerly Car Sharing and Mobility Options)</td>
<td>$11.1</td>
<td>$1.1</td>
</tr>
<tr>
<td>Increased Public Fleet Incentives for CVRP-Eligible Vehicles</td>
<td>$6</td>
<td>$5</td>
</tr>
<tr>
<td>Agricultural Worker Vanpools</td>
<td>$3</td>
<td>$0</td>
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<tr>
<td>Rural School Bus Pilot</td>
<td>$10</td>
<td>$6</td>
</tr>
<tr>
<td>Total</td>
<td>$109</td>
<td>$25</td>
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## Proposed Transportation Equity Funding FY 2017-18

<table>
<thead>
<tr>
<th>Project</th>
<th>Proposed Transportation Equity Allocations by Funding Source (millions)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low Carbon Transportation</td>
<td>Volkswagen Settlement</td>
</tr>
<tr>
<td>EFMP Plus-up</td>
<td>$10</td>
<td>$10</td>
</tr>
<tr>
<td>Financing Mobility Options for Disadvantaged Communities</td>
<td>$10</td>
<td>$10</td>
</tr>
<tr>
<td>Clean Mobility Options for Disadvantaged Communities</td>
<td>$17</td>
<td>-</td>
</tr>
<tr>
<td>Agricultural Worker Vanpools</td>
<td>$3</td>
<td>-</td>
</tr>
<tr>
<td>Rural School Bus Pilot</td>
<td>$10</td>
<td>-</td>
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<td>CVRP Rebates for Low-income Households</td>
<td>$40</td>
<td>-</td>
</tr>
<tr>
<td>To Be Allocated Based on Demand</td>
<td>$10</td>
<td>-</td>
</tr>
<tr>
<td>One-Stop-Shop for CARB's Equity ZEV Replacement Incentives (new)</td>
<td>-</td>
<td>$5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$100</strong></td>
<td><strong>$25</strong></td>
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</tbody>
</table>

### EFMP Plus-up Current Status

- Incentives for lower-income consumers living in or near disadvantaged communities to scrap old cars and buy advanced technology cars

- $72 million allocated
  - $42 million awarded to San Joaquin Valley and South Coast
  - $10 million reserved for new air districts
  - $20 million will be carried over to FY 2017-18

- Implementation status
  - $12 million spent through June 2017
  - 2,100 vehicles retired and replaced
EFMP Plus-up Recommendations for FY 2017-18

• $20 million proposed FY 2017-18 allocation
  ‒ Combine with $20 million carry over

• Allocate as follows
  ‒ $30 million for San Joaquin Valley and South Coast
  ‒ $6 million to expand to other air districts
  ‒ Up to $4 million to allocate in spring 2018
  ‒ Small portion for new data reporting system

• Flexibility to use Volkswagen funds to expand program for low-income consumers outside of disadvantaged communities

Financing Assistance Current Status

• Financial assistance to enable lower-income consumers to purchase or lease advanced technology vehicles

• $6.9 million allocated
  ‒ $0.9 million award to California Housing Development Corporation for Bay Area project
  ‒ $6 million solicitation for statewide project released spring 2017, grant award anticipated October 2017
Financing Assistance Recommendation for FY 2017-18

- $20 million proposed FY 2017-18 allocation
  - $18 million for statewide project, competitive solicitation, annual option to renew over 3-year term
  - $2 million for expansion of the existing local project

Clean Mobility Options for Disadvantaged Communities Current Status

- Help disadvantaged communities benefit from shared use of advanced technology cars, vanpools, and other mobility options
- $11.1 million allocated
  - $3.4 million awarded to launch projects in Los Angeles and Sacramento
  - $6 million FY 2016-17 solicitation closed May 2017
  - Up to $2 million reserved to expand the existing projects
Clean Mobility Options for Disadvantaged Communities
Recommendations for FY 2017-18

- $17 million proposed FY 2017-18 allocation
  - $12 million competitive solicitation for statewide administrator outreach to communities
  - Implement simple application process for small-scale mobility projects
  - $5 million for expansion of existing car share pilot projects

Agricultural Worker Vanpools
Current Status and Recommendation for Fiscal Year 2017-18

- Expanded access to clean transportation vanpools for agricultural workers in San Joaquin Valley disadvantaged communities
- $3 million allocated to date
  - Competitive solicitation to be released winter 2017
- $3 million additional proposed for FY 2017-18
  - Focus on fulfilling need in San Joaquin Valley with option to expand to other disadvantaged communities
Rural School Bus Pilot Project
Current Status

- Incentives for lower-carbon school bus fleets
- $10 million project administered by North Coast Unified air district
  - Solicitation funding requests totaled $127 million
  - Will fund 29 zero-emission or renewable-fueled school buses for small air districts
- Grants in process, about $6 million expended to date

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Rural School Bus Pilot Project
Recommendation for Fiscal Year 2017-18

- $10 million proposed FY 2017-18 allocation
- No changes to project design
- Continue to prioritize funding for school districts in small- and medium-sized air districts
One-Stop-Shop for CARB’s Equity Replacement Incentives

• $5 million proposed new project allocation

• Develop single application tool for consumers to access EFMP Plus-up and other projects
  – Simplify application process for income eligibility

• Consumer education and awareness for EFMP Plus-up and suite of incentives
  – Direct outreach at the community level

Session 3:
Heavy-Duty Vehicle and Off-Road Equipment Investments
Implementation Status

- FY 2014-15: two multi-source facility demonstrations and a zero-emission drayage truck demonstration currently underway
- FY 2014-15, 2016-17: three truck and five bus pilots currently underway
- FY 2016-17: on-road and off-road demonstration solicitations closed and scoring underway

Policy and Statutory Drivers
Heavy-Duty and Off-Road Projects

- AB 32 Scoping Plan
- SB 1204
- SIP Mobile Source Strategy
- California Sustainable Freight Action Plan
- ZEV Action Plan
- Short-Lived Climate Pollutant Reduction Strategy
- Governor’s Climate Change Strategy Pillars
SB 1204: Clean Truck, Bus, and Off-Road Vehicle Technology Program

• Guide Low Carbon Transportation Investments
• Zero- and near zero-emission vehicle and equipment projects
• Priority for projects in disadvantaged communities
• Support evolution of technology advancement
• Requires 20% of funding for early commercial deployment

Recommended Project Allocations: Heavy-Duty Vehicles and Off-Road Equipment

<table>
<thead>
<tr>
<th>Project Category</th>
<th>Allocation (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Freight Demonstration and Deployment</td>
<td></td>
</tr>
<tr>
<td>• $150 million for Zero- and Near Zero-Emission Freight Facilities</td>
<td>$190</td>
</tr>
<tr>
<td>• $40 million for Zero-Emission Off-Road Freight Vouchers</td>
<td></td>
</tr>
<tr>
<td>Clean Truck and Bus Vouchers (HVIP and Low NOx Engines)</td>
<td>$188</td>
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<td>$20</td>
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<td><strong>Total</strong></td>
<td><strong>$398</strong></td>
</tr>
</tbody>
</table>
Zero- and Near Zero-Emission Freight Facilities Project

Zero- and Near Zero-Emission Freight Facilities Project Overview

- Holistically reduce GHG and criteria pollutant emissions in freight facilities
  - Showcase potential for widespread commercial acceptance of zero- and near zero-emission vehicles and equipment
  - Accelerate commercialization of zero- and near zero-emission goods movement technologies
  - Demonstrate viability of deploying system and energy efficiencies
Zero- and Near Zero-Emission Freight Facilities Project Funding Recommendation

$150 million total funding

<table>
<thead>
<tr>
<th>Fund Source</th>
<th>Eligible Projects / Details</th>
<th>Recommended Allocation (millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Carbon Transportation</td>
<td>• Freight Equipment Advanced Demonstration and Pilot Commercial Deployment Project</td>
<td>$100</td>
</tr>
<tr>
<td>Trade Corridor Enhancement Account</td>
<td>• Zero- and Near Zero-Emission Warehouse Program</td>
<td>$50</td>
</tr>
</tbody>
</table>

Project Requirements

- $50 million will be invested in warehouse projects
- Remaining $100 million will be invested in a variety of freight facility projects
- 1:1 match requirement for entire allocation
- Competitively funded
- 100 percent of spending in disadvantaged communities
- Data collection component
Other Project Elements

- Incentive Caps
  - Regional cap: no more than 50% of the allocation can go to any one region
  - Facility type cap: No more than 33% of the funding can go to any one type of facility
  - Others?

- Match Eligibility
  - Workforce training and development
  - Energy efficiency upgrades
  - Others?

Eligible Projects

- On- and off-road vehicles, equipment, infrastructure
- Includes demonstration, pilot, commercial stages
- Projects for ships at berth, including shore power and bonnet systems
- System efficiency upgrades, including process improvements
- Education and outreach
Zero-Emission Off-Road Freight Voucher Incentive Project

Zero-Emission Off-Road Freight Vouchers Overview

- $40 million in proposed funding from AB 134
- Accelerate deployment and consumer acceptance of zero-emission off-road freight equipment
- Structured like HVIP (first-come, first-served)
- Could provide additional funding for technology support costs (infrastructure, training, etc.)
- Increased voucher amount for zero-emission equipment in disadvantaged communities
Zero-Emission Off Road Freight Vouchers Eligible Equipment Types

- Off-Road Terminal Trucks
- Cargo Handling Equipment
- Rubber-Tired Gantry Cranes
- Transport Refrigeration Units
- Forklifts*
- Ground Support Equipment*

*Early Commercial Applications Only

Zero-Emission Off Road Freight Vouchers - Voucher Amounts

- For off-road terminal trucks, align with HVIP
- For others, incremental cost is starting point for discussion
- Actual amounts to be based on technology status
- Enhancements: infrastructure, training, etc.
Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) and Low NOx Engine Incentives

Background

- Vouchers for California fleets on a first-come, first-served basis to lower cost of clean trucks and buses
- Enhancement for zero-emission vehicles in disadvantaged communities
Status Update

- $123 million since 2010
  - 2,360 diesel-hybrid trucks
  - 761 zero-emission vehicles
  - 337 low NOx engines
  - 107 electric power take-off systems (ePTO) for utility trucks

Status Update Continued

- HVIP waiting list
  - Transfer $5 million from the Zero-Emission Freight Equipment Pilot Commercial Deployment Project to HVIP
  - $35 million from FY 2017-18 funding will be made available to HVIP
  - Funding available by end of October 2017, first part of November 2017

- Continuous funding for low NOx engines
HVIP and Low NOx Engine Incentives Funding Recommendation

$180 million from Low Carbon Transportation as specified in AB 134
- At least $35 million for zero-emission buses
- $145 million first-come, first-serve
- Fully fund market growth
- Help meet SB 1204 early commercial truck deployment requirement

HVIP and Low NOx Engine Incentives Funding Recommendation Continued

Low NOx Engine Incentives
- Carry over $10 million remaining from FY 2016-17
- $8 million from AQIP in FY 2017-18
- Continue to implement through HVIP on a first-come, first-served, statewide basis
Changes to Low NOx Engine Incentives Criteria

- New flexibility for conventional fuels with the 11.9 liter natural gas engine for small fleets
- $10,000 voucher for 8.9 liter natural gas engine
- $40,000 voucher for 11.9 liter natural gas engine

Changes to HVIP Project Criteria

- Expand funding for large zero-emission trucks, transit, and school buses
- New voucher funding for hydrogen fuel cell technology
- Remove fleet limits
- Voucher enhancement changes
Changes to HVIP Project Criteria Continued

- Expand eligibility for ePTOs
- Additional support for hybrid conversions

Truck Loan Assistance Program
Background

- Provides financing assistance to truckers subject to the In-Use Truck and Bus Regulation for purchasing newer trucks or exhaust retrofits
- About $87 million State contribution to date
  - Leveraged to provide about $912 million in financing
  - 15,400 trucks, exhaust retrofits and trailers
- Helps small fleets (10 or fewer trucks)
- Incremental recapture of funds in place

Truck Loan Assistance Program Funding Recommendation

$20 million from AQIP

- Remaining funds from FY 2016-17 will help with short-term cash flow

Strategies

- Consider alignment of contribution rates
- Evaluate options to meet additional demand generated by SB1 requirements
Three-Year Investment Strategy for Heavy-Duty Vehicles and Off-road Equipment

Plan Purpose

- Three-year “roadmap” for heavy-duty vehicle and off-road equipment investments
- Provide recommendations for prioritizing Low Carbon Transportation and AQIP funds for heavy-duty vehicle and off-road equipment incentives
Introduction

- Incentive need for transformation is enormous
- Investments meant to jump-start the transformation
- Down payment on the overall need

Background

- Transformation path to:
  - Zero-emission technologies everywhere feasible
  - Near zero-emission technologies with the cleanest, low carbon fuels everywhere else
- Support our climate change and air quality goals
Investment Strategy Development

- Built on prior Low Carbon Transportation/AQIP investments
- Identify core pathways
- Assessed state of technology, market readiness
- Overlaid concept of beachheads on traditional portfolio approach to help focus investment decisions

Pathways to Our Near-Term and Long-Term Goals

- Zero Emission Capable
  - Battery Electric Technologies
  - Fuel Cell Electric Technologies
  - Hybrid Electric Technologies

- Low NOx
  - Engine and Powertrain Improvements

- Efficiency
  - Engine, Powertrain, Vehicle, and Operational Improvements
Snapshots of Technology Status

- For each technology category, a discussion of:
  - Technology – market assessment, the spectrum of applications across technology readiness levels, etc.
  - Specific applications in the on-road and off-road sectors
  - Key barriers or obstacles to further development and implementation
  - Opportunities for the next three years

The Portfolio Approach

[Diagram showing funding amounts per vehicle for different technologies over time, with stages of development and commercialization marked.]
Example: Beachhead Market Leads to Additional Applications and Larger Markets

Metrics of Success

- Cost-effectiveness is current common metric
- Other ways of measuring success:
  - Creating Healthy Communities
  - Growing the Green Economy
  - Supporting Technology Evolution
Recommendations

• Build on successful beachheads
• Seed promising next markets
• Maintain the innovation pipeline

Draft Recommendations for Priorities to Advance Pathways: Demonstration

<table>
<thead>
<tr>
<th>FY 2018-19</th>
<th>FY 2019-20</th>
<th>FY 2020-21</th>
</tr>
</thead>
<tbody>
<tr>
<td>$70-135 Million</td>
<td>$50-80 Million</td>
<td>$55-85 Million</td>
</tr>
<tr>
<td>Focus: ZE/PHEV On-Road Drayage,</td>
<td>Focus: PHEV/Extended Range M/HD</td>
<td>Focus: ZE/PHEV HD Regional Delivery,</td>
</tr>
<tr>
<td>Advanced Powertrains, ZE/Hybrid</td>
<td>Delivery, Advanced Powertrains,</td>
<td>ZE/Hybrid Construction Equipment</td>
</tr>
<tr>
<td>Heavier Cargo Handling Equipment</td>
<td>ZE/Hybrid Heavier Cargo Handling</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
<td></td>
</tr>
</tbody>
</table>

Three-year funding plan investment priorities define yearly focus areas and propose funding that aligns with progress required for key pathways.

The draft funding amounts listed here represent a critical down payment towards meeting the funding need outlined at the beginning of this section, but do not meet the entire need.
### Draft Recommendations for Priorities to Advance Pathways: Pilot

<table>
<thead>
<tr>
<th>FY 2018-19</th>
<th>FY 2019-20</th>
<th>FY 2020-21</th>
</tr>
</thead>
<tbody>
<tr>
<td>$110-225 Million</td>
<td>$150-250 Million</td>
<td>$160-275 Million</td>
</tr>
<tr>
<td>Focus: ZE Delivery,</td>
<td>Focus: ZE/PHEV On-Road</td>
<td>Focus: ZE/PHEV Drayage</td>
</tr>
<tr>
<td>Facilities, Fuel</td>
<td>Drayage and M/HD</td>
<td>and Regional Delivery,</td>
</tr>
<tr>
<td>Cell Transit, ZE</td>
<td>Trucks, ZE/Hybrid</td>
<td>ZE/Hybrid Heavier</td>
</tr>
<tr>
<td>Freight Facilities</td>
<td>Handling Equipment, ZE</td>
<td>Cargo Handling</td>
</tr>
<tr>
<td></td>
<td>Facilities</td>
<td>Facilities</td>
</tr>
</tbody>
</table>

Three-year funding plan investment priorities define yearly focus areas and propose funding that aligns with progress required for key pathways.

The draft funding amounts listed here represent a critical down payment towards meeting the funding need outlined at the beginning of this section, but do not meet the entire need.

### Draft Recommendations for Priorities to Advance Pathways: Commercial

<table>
<thead>
<tr>
<th>FY 2018-19</th>
<th>FY 2019-20</th>
<th>FY 2020-21</th>
</tr>
</thead>
<tbody>
<tr>
<td>$175-280 Million</td>
<td>$240-425 Million</td>
<td>$335-595 Million</td>
</tr>
<tr>
<td>Focus: Battery Electric</td>
<td>Focus: ZE Transit Buses</td>
<td>Focus: ZE Delivery Trucks,</td>
</tr>
<tr>
<td>Transit Buses, Low NOx</td>
<td>and Delivery Trucks, Low</td>
<td>Fuel Cell Transit, Low</td>
</tr>
<tr>
<td>Regional Trucks; Yard</td>
<td>NOx Regional Trucks;</td>
<td>NOx Linehaul Trucks;</td>
</tr>
<tr>
<td>Tractors, Cargo Handling</td>
<td>Yard Tractors, Ground</td>
<td>Ground Support</td>
</tr>
<tr>
<td>Equipment</td>
<td>Support Equipment, Cargo</td>
<td>Equipment, Cargo</td>
</tr>
<tr>
<td></td>
<td>Handling Equipment</td>
<td>Handling Equipment</td>
</tr>
</tbody>
</table>

Three-year funding plan investment priorities define yearly focus areas and propose funding that aligns with progress required for key pathways.

The draft funding amounts listed here represent a critical down payment towards meeting the funding need outlined at the beginning of this section, but do not meet the entire need.
Summary

- The need for investment is enormous
- This is part of the down payment for transformation
- Need to identify metrics outside of cost effectiveness to demonstrate success
- Many barriers to achieving transformation; some we can address and some we cannot
- Living document – update annually

Thank you

- Thanks to stakeholders who were active in our workgroup process
- Thanks to the technology providers and others who contributed to the technology examples highlighted throughout the document
Next Steps

- Request comments by October 9
- Post proposed Funding Plan for 30 day public comment on October 13
- Board considers Funding Plan at public meeting in Sacramento on November 15-16