STATE OF CALIFORNIA CAPITAL OUTLAY BUDGET CHANGE PROPOSAL (COBCP) COVER PAGE (REV 08/14)	DEPARTMENT OF FINANCE 915 L Street Sacramento, CA 95814 IMS Mail Code: A15

BUDGET YEAR 2015-16

ORG CODE: 3900 COBCP NO. 1 PRIORITY: 1 PROJECT ID: 000000000000691

DEPARTMENT: Air Resources Board

PROJECT TITLE: ARB Southern California Consolidation Project

TOTAL REQUEST (DOLLARS IN THOUSANDS): $5,893 MAJOR/MINOR: Major

PHASE(S) TO BE FUNDED: A/PC PROJ CAT: CRI CCCI/EPI: 5959

SUMMARY OF PROPOSAL: The Air Resources Board (ARB) requests $5.9 million in Fiscal Year 2015-16 to consolidate and relocate ARB's existing motor vehicle and engine emissions testing and research facilities. These facilities are located in Southern California. The funds will come from the Motor Vehicle Account ($3.8 million), the Air Pollution Control Fund ($1.2 million), and the Vehicle Inspection Repair Fund ($0.9 million). The requested funding would be used to assess the suitability of a proposed new site ($0.2 million) and develop performance criteria ($5.7 million) for this project. The existing ARB facilities no longer meet ARB's programmatic requirements, nor do they allow ARB the space necessary to perform the testing required to meet current air quality and climate change mandates. The existing state-owned property that ARB uses for vehicle emissions testing is too small to accommodate the construction of the requested replacement facility. Therefore, ARB proposes to relocate and build a new replacement facility using the design-build procurement method. The total cost of this project, including relocation and construction, is estimated to be $365.9 million.

HAS A BUDGET PACKAGE BEEN COMPLETED FOR THIS PROJECT? (E/U/N/?): N/A

REQUIRES LEGISLATION (Y/N): No IF YES, LIST CODE SECTIONS: N/A

REQUIRES PROVISIONAL LANGUAGE (Y/N): No

IMPACT ON SUPPORT BUDGET: ONE-TIME COSTS (Y/N): Yes FUTURE COSTS (Y/N): Yes

FUTURE SAVINGS (Y/N): No REVENUE (Y/N): No

DOES THE PROPOSAL AFFECT ANOTHER DEPARTMENT (Y/N): No IF YES, ATTACH COMMENTS OF AFFECTED DEPARTMENT SIGNED BY ITS DIRECTOR OR DESIGNEE.

SIGNATURE APPROVALS:

1/7/2015		1-7-15	
PREPARED BY Deidre Cyprian	DATE	REVIEWED BY Alice Stebbins	DATE
1/7/2015		1-7-15	
DEPARTMENT DIRECTOR Richard Corey	DATE	AGENCY SECRETARY Matthew Rodriguez	DATE

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DOF ANALYST USE

DOF ISSUE #_____ PROGRAM CAT:___ PROJECT CAT:___ BUDG PACK STATUS:____

ADDED REVIEW: SUPPORT:____OCIU:____ FSCU/ITCU:____ OSAE:___ CALSTARS: ____

PPBA: _____ Date: _____

STATE OF CALIFORNIA CAPITAL OUTLAY BUDGET CHANGE PROPOSAL (COBCP) NARRATIVE PAGE (REV 08/14)	DEPARTMENT OF FINANCE 915 L Street Sacramento, CA 95814 IMS Mail Code: A15
BUDGET YEAR 2015-16	

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A. PURPOSE OF THE PROJECT

1. Problem

The existing Southern California Haagen-Smit Laboratory (HSL) facilities and infrastructure are insufficient to meet existing and future equipment, fuel, and emissions testing needs. In addition, the HSL facilities are not energy efficient and the HSL property is too small to modify and consolidate testing operations. California will not be able to meet existing and future air quality State Implementation Plan (SIP) and climate change emission reduction mandates unless the existing emissions testing and research capabilities are increased. Therefore, the Air Resources Board (ARB) requests funding to construct a new motor vehicle and engine emissions testing and research facility to meet existing and future program needs.

In 1971, ARB opened HSL in El Monte. The HSL is the center of California's mobile source regulatory activities and supports the development of effective approaches to reducing vehicle and engine emissions and improving air quality. Work conducted at HSL has contributed to the development of rigorous approaches to testing and certification of emission control systems on almost every kind of engine used in California.

Scientific data collected via HSL staff efforts has led to regulations that lower harmful smog-forming and toxic pollution and greenhouse gases (GHG) from vehicles and engines and protect public health while also allowing and supporting economic development. Today's passenger car is 98 percent cleaner than a similar mid-1970s model, and new diesel engines are 95 percent cleaner than those manufactured during the 1980s.[1] Over the past forty years, many other states and international jurisdictions have adopted California's vehicle emission regulations.

The original program has advanced from testing just gasoline-powered passenger vehicles to include testing, research, and certification on many other types of vehicles and engines. These vehicles and engines include four-wheel drive, light-duty and heavy-duty diesel, and hybrid vehicles, large off-road equipment, motorcycles, lawn and garden equipment, small off-road engines, and marine engines. To ensure compliance with the Clean Fuels regulation, staff analyzes fuel samples from around the state. In addition, ARB tests and certifies a variety of 'after-market' equipment and new on-road and off-road sources. After-market equipment ranges from modified fuel-injectors to exhaust systems. The number of these certifications has risen by 50 percent over the past decade. Finally, the universe of pollutants tested has expanded from simple pollutants such as carbon monoxide, oxides of nitrogen, and sulfur dioxide to now include hundreds of organic compounds, particulate matter, toxic air pollutants, and greenhouse gases.

[1] The California Almanac of Emissions and Air Quality, 2013 Edition.
http://www.arb.ca.gov/aqd/almanac/almanac13/almanac2013all.pdf

HSL was originally designed to support 40 staff and encompassed about 54,000 square feet. HSL now encompasses all or part of five leased buildings adjacent to the original HSL, with over 400 staff. In addition, ARB also operates a small heavy-duty testing facility located at the Los Angeles Metropolitan Transit Authority (MTA) facility about 10 miles away in Los Angeles. ARB operates that facility under a Memorandum of Understanding (MOU) with MTA. Given the limited size of HSL, ARB currently conducts the testing of heavy-duty diesel engines and trucks at the MTA facility. This location does not meet existing and future heavy-duty testing needs that are so critical to the continued reduction of diesel particulate matter and support of the Sustainable Freight Initiative.

Over the last 20 years, ARB has conducted testing at HSL to develop onboard diagnostic systems (OBD). OBD systems are used to continually test the functioning of emissions control equipment for both light-duty and heavy-duty vehicles. These systems are now the main indicator of vehicle failures in the Smog Check program for light-duty vehicles.

ARB will not be able to effectively meet current and future federal air quality mandates under the Clean Air Act and statutory climate change requirements without additional emissions testing and research capabilities. These capabilities are needed for support of new fuels and vehicles in development and various stages of commercialization to transform the state's transportation system. Some of these mandates and requirements in the future include:

- By 2020, the Global Solutions Warming Act of 2006 (Assembly Bill 32) requires California to reduce its GHG emissions to 1990 levels. This is a reduction of approximately 15 percent below emissions expected under a "business as usual" scenario.
- By 2023, California must achieve the federal 1997 8-hour ozone air quality standard in all regions of California.
- By 2030, California must achieve the federal 2012 annual $PM_{2.5}$ air quality standard in all regions of California.
- By 2031, California must achieve the more stringent 2008 federal 8-hour ozone standard in all regions of California.
- By 2050, California has set for itself the 2050 goal of GHG emissions of 80 percent less than 1990 levels overall, and specifically 80 percent less than 1990 levels for the transportation sector.

One significant advantage to the proposed new facility would be the ability to research and test heavy-duty trucks and engines onsite, rather than at a temporary facility over 10 miles away. This is especially important as ARB embarks on the Sustainable Freight Initiative to reduce emissions from the way freight is transported in California by supporting innovative and feasible zero- and near-zero technologies in the freight sector.

Planning for a new facility began in 2006 with an initial study of the needs, size, and requirements of a new facility. This study was expanded and updated in 2014 to include a broad range of changes and new regulatory and other workload requirements, including the added mission to develop and implement climate change mitigation strategies. The challenge for the new facility will be to continue providing current services for existing internal combustion engines, while ramping up and expanding the scope of testing needed to support the development and deployment of the new generation of energy-efficient vehicles and associated diversified fuel sources.

We are at the beginning of the market penetration of new generation cleaner vehicles – including both on-road and off-road uses. As in every era of technological transition, there are a wide variety of technologies competing to dominate the marketplace. Hybrids, plug-in hybrids, full battery electric, hydrogen fuel cell electric drive, catenary electric drive, induction electric drive, and even Maglev (magnetic levitation) technologies for moving freight are either already in production or only a few years from being introduced commercially to the market.

This variety of propulsion technologies is matched by a parallel expansion in the variety of fuels that are currently on the market, or poised to enter it. As a direct result of the Low Carbon Fuel Standard, for example, California is now seeing varieties of ethanol fuels, renewable gasoline and diesel, biodiesel, and natural gas (from both fossil and renewable sources) becoming available for existing and future internal combustion engines. Electricity is becoming a more common vehicle fuel and the state is investing $200 million in building a network of hydrogen fueling stations to service fuel-cell vehicles.

Every effort will be made to ensure that the new facility is designed to meet the needs of California in a cost-effective manner. Current plans for the new replacement facility include meeting LEED certified standards and incorporating a high energy-efficiency design. These attributes are consistent with new requirements for state buildings.

The new facility will provide the technical foundation for California to continue to support clean vehicles, engines, and fuels, protect public health, and meet federal and state air quality standards and climate change requirements. The facility will support and advance air pollution research and climate-related science in support of regulatory and other programs enhancing public health and environmental protection.

2. Program Needs

California's Air Quality and Climate Change Challenges

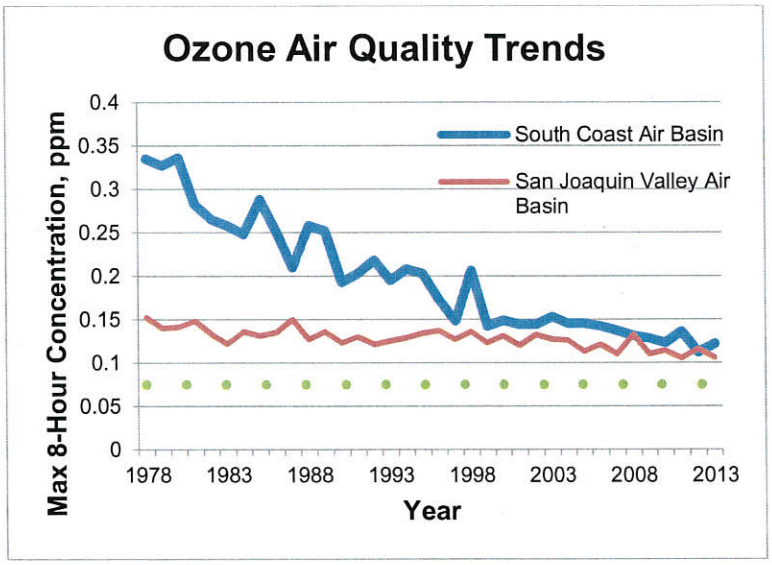
The state faces significant challenges in addressing the problems caused by unhealthy air quality and climate change. Meeting these challenges will require expanding the existing air quality and emissions testing and research facilities in Southern California.

Historically, ARB's emissions testing and research programs have provided air quality decision-makers with accurate and reliable measurements of vehicle exhaust and evaporative emissions and fuel parameters, and research testing in mobile source-related areas. This testing has shaped California's mobile source control programs for sources such as passenger cars, heavy-duty diesel trucks, motorcycles, lawn and garden equipment, small off-road engines, and marine engines. These efforts have provided the data necessary for ARB to develop robust regulations that have withstood multiple lawsuits and resulted in manufacturers producing the cleanest vehicles and engines in the world. Many other air pollution control agencies throughout the world have adopted or adapted these programs for their jurisdictions.

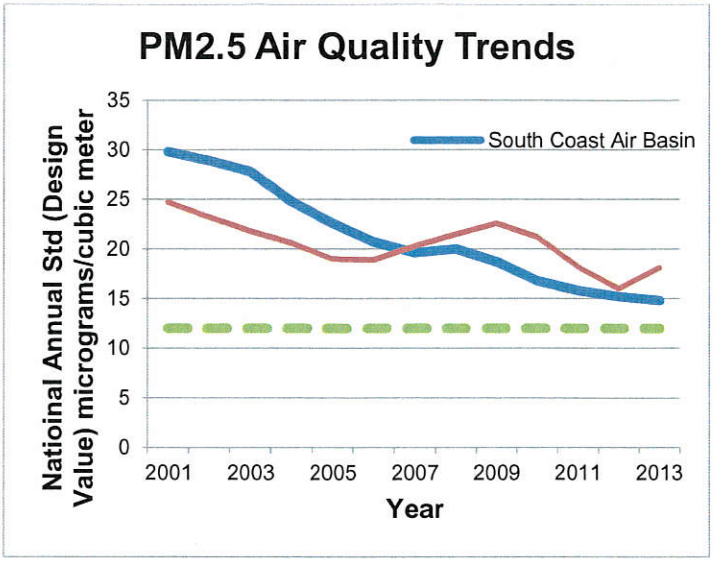
The emission reductions that occurred over the years had a large positive impact on air quality. Over the last 20 years, California's population has increased 22 percent and the number of vehicle miles traveled has increased more than 45 percent. At the same time, statewide emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x) decreased 50 and 60 percent, respectively. Nevertheless, mobile sources still account for about 80 percent of total NO_x emissions and 50 percent of total VOC emissions. Both of these compounds are key

contributors to ozone and particulate matter. Therefore, ARB must pursue expanded and new cost-effective and innovative strategies to attain and maintain healthy air quality for all Californians.

From an air quality perspective, California is currently in attainment with federal air quality standards for carbon monoxide and lead, primarily due to the reductions in emissions from motor vehicles. Compared with 1990, ozone concentrations are about 10 to 50 percent lower throughout California, with some of the largest decreases occurring in areas with the worst ozone air quality. Additionally, the number of days people are exposed to unhealthy ozone levels has dropped by an average of over 65 percent among the air basins. The figure below shows the change in ozone air quality for the South Coast and San Joaquin Valley Air Basins since 1978.



The number of days exceeding the 24-hour $PM_{2.5}$ standard statewide has declined since 2001, from 229 days to 128 days, and the annual average concentrations have declined approximately 35 percent in most California air basins. However, the South Coast and San Joaquin Valley still pose significant remaining challenges for ozone and $PM_{2.5}$ attainment. The figure below shows the change in $PM_{2.5}$ air quality since 1999 for the South Coast and San Joaquin Valley Air Basins.



The bullets below highlight some of the air quality and climate change problems ARB programs are designed to address.

- Many California Residents Still Breathe Unhealthy Air
  - Ozone and $PM_{2.5}$ continue to exceed federal ambient air quality standards.
  - Exposure to ozone is strongly linked to respiratory effects, including asthma exacerbation, reduced lung function, and hospitalization. $PM_{2.5}$ is linked to mortality and hospitalization for cardiovascular diseases.
  - The South Coast Air Basin and the San Joaquin Valley are the only two extreme ozone non-attainment areas in the nation. They must achieve the most stringent federal ozone standard in 2031.
  - California must meet federal air quality standards or risk the federal government mandating potentially costly additional clean air measures and the imposition of additional fees required by the Clean Air Act on stationary sources, thus adversely affecting California's business climate.
  - ARB identified particulate matter (PM) from diesel-fueled vehicles (diesel PM) as a toxic air contaminant based on its potential to cause cancer, premature death, and other health problems. Many California communities, including low-income and minority communities, are exposed to elevated levels of diesel PM. Mobile sources account for 97 percent of the emissions of diesel PM.
  - ARB has also identified about 200 other air pollutants as toxic air contaminants. These contaminants have been found, or are suspected of having, chronic, negative health effects, such as causing cancer. Motor vehicles are major sources of some of the more significant toxic air contaminants, such as benzene and 1-3 butadiene.

- Climate Change Contributes to Significant Health and Environmental Issues Unless Abated
  - Extreme heat events create a significant risk of adverse health effects and heat-related mortality. A 2006 heat wave in California resulted in over 650 excess deaths, over 16,000 excess emergency department visits and almost 1,200 excess hospitalizations.[2] [3]

[2] Hoshiko, S., P. English, D. Smith, and R. Trent. 2010. "A simple method for estimating excess mortality due to heat waves, as applied to the 2006 California heat wave." Int J Public Health 55(2): 133–7.

Older adults with chronic health problems, and agriculture, construction, and other outdoors workers are particularly at high risk for adverse effects of extreme heat.

- Increasing temperatures may exacerbate air pollution in California, particularly ozone and $PM_{2.5}$.[4 5]
- Higher temperatures will also likely increase and intensify wildfires in the state, exacerbating poor regional air quality.[6]
- Changes in climate can also affect the prevalence and geographic location of food-, mosquito-, and vector-borne diseases.
- Changes in precipitation patterns can threaten the quality and supply of water and endanger agricultural production.
- Climate change is expected to more seriously affect the health and well-being of the communities that are the least able to prepare for, cope with, and recover from its impacts. For instance, low-income communities and communities of color are expected to be hit harder by extreme heat, extreme weather events, and worsened air pollution.
- California also faces potential impacts from drought, extreme storms, coastal flooding and erosion, and reductions in the Sierra Nevada springtime snowpack. Climate change also threatens to affect water availability.
- Mitigation of short-lived climate pollutants leads to immediate reductions in the rate of climate change. Short-lived climate pollutants include black carbon, tropospheric ozone, methane, and hydrofluorocarbons. Black carbon (as a component of $PM_{2.5}$) and ozone are air pollutants with substantial health effects, and reducing their emissions can offer significant improvements in air quality and public health.

Statutory Authority to Address Air Quality and Climate Change

Air Pollution Control Program

ARB has longstanding statutory authority to attain and maintain healthy air quality, reduce the public's exposure to toxic air pollutants, conduct research into the causes of and solutions to air pollution; and systematically attack the serious problems caused by motor vehicles.[7] The federal Clean Air Act recognizes California as the only state in the nation authorized to adopt motor vehicle emissions standards that are more stringent than the federal standards. This authority recognizes California's unique and persistent air quality problems and its longstanding ability to establish stringent motor vehicle standards through effective research and development programs.

Climate Change Mitigation Program

Assembly Bill 32 (AB 32), the California Global Warming Solutions Act of 2006,[8] declares that global warming poses a serious threat to the economic well-being, public health, natural resources, and environment of California. The law specifically charges ARB with "monitoring and regulating sources of emissions of greenhouse gases that cause global warming in order to

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[3] Knowlton, K., M. Rotkin-Ellman, G. King, et al. 2009. "The 2006 California heat wave: Impacts on hospitalizations and emergency department visits." Environ Health Perspect 117(1): 61–7.
[4] Drechsler, D. M. 2009. Climate Change and Public Health in California.
[5] Cities' Air Problems Only Get Worse With Climate Change. http://www.nytimes.com/2014/08/21/business/international/cities-air-problems-only-get-worse-with-climate-change.html?module=Search&mabReward=relbias%3As%2C%7B%222%22%3A%22RI%3A17%22%7D&_r=0.
[6] Ibid.
[7] The Mulford-Carrell Air Resources Act of 1967, as amended and codified at California Health and Safety Code Division 26, sections 39000 et seq.
[8] Assembly Bill 32, Statutes of 2006, Chapter 488.

reduce emissions of greenhouse gases."[9] AB 32 provided initial direction on creating a comprehensive multi-year program to limit California's greenhouse gas (GHG) emissions at 1990 levels by 2020. The passage of AB 32 and its ongoing implementation has put California on a path to continually reduce GHG emissions by adopting and implementing regulations and other programs to reduce emissions from cars, trucks, electricity production, fuels, and other sources.

AB 32 also provided the statutory authority to initiate the transformations required to achieve the state's long-range climate objectives. The state has a 2050 goal of reducing emissions to 80 percent below 1990 levels, as reflected in Executive Order S-3-05 and Governor Brown's Executive Order B-16-2012.

Need for Air Quality and Climate Change Emission Reductions

California has been a world leader in reducing smog-forming and toxic pollutants and particulate matter emissions from motor vehicles to protect public health. Today's passenger car is 98 percent cleaner than a similar mid-1970s model, and new diesel engines are 95 percent cleaner than those manufactured during the 1980s.[10] However, ARB must continue to focus and intensify efforts to obtain additional reductions of harmful emissions from motor vehicles. Motor vehicles are still responsible for about one-half of all volatile organic compound (VOC) emissions and three-quarters of all NO_x emissions. In addition, mobile sources are responsible for about 36 percent of GHGs and 97 percent of the public's exposure to diesel PM.

Ongoing scientific studies show that NO_x emissions must be reduced to achieve federal ozone standards in both the South Coast Air Basin and the San Joaquin Valley. Increasingly stringent federal ozone standards must be met in 2023 and 2031. To achieve the standards in the South Coast Air Basin, it is estimated that NO_x emissions must be reduced by about 80 percent from 2010 levels in 2023 and almost 90 percent in 2031. Similar levels of emissions reductions are also likely needed in the San Joaquin Valley. One scenario for reaching the longer-term 2031 ozone standard requires a nearly complete transformation of new passenger vehicle sales to zero-emission technologies, approximately 80 percent of the new truck fleet sales to zero-or near-zero technology, and nearly all locomotives operating in the South Coast Air Basin to be using some form of zero-emission technology.

Progressing toward California's long-term climate goals will require that GHG reduction rates also be accelerated significantly. Emissions from 2020 to 2050 will have to decline at more than twice the rate of that which is needed to reach the 2020 statewide emissions limit. To achieve the 2050 goal, California must maintain and build upon existing programs, scale up additional deployment of clean technologies, and provide more low-carbon options to accelerate GHG emission reductions, especially after 2020.

Even with the transformation to zero-emission technologies, there remains a significant ongoing demand for emissions testing and research on motor vehicles. Motor vehicle fleets are slow to turn over to new technologies. For example, the current projections of vehicle populations in 2040 indicate that over 90 percent of the existing fleet will still consist of vehicles using internal combustion engines for all or part of their propulsion. Consequently, the need for robust mobile

[9] Health and Safety Code section 38510
[10] The California Almanac of Emissions and Air Quality, 2013 Edition. http://www.arb.ca.gov/aqd/almanac/almanac13/almanac2013all.pdf

source emissions testing and research capabilities will continue to be critical to ARB's ability to meet future federal air quality standards and climate change emissions reduction requirements.

Description of HSL Southern California Facilities

ARB Facilities in Southern California

To support ARB programs in Southern California, ARB occupies the state-owned HSL and all or part of five adjacent leased buildings in El Monte. In addition to HSL, various testing and research activities are conducted in two of the leased buildings. The testing in El Monte is primarily focused on passenger cars, motorcycles, lawn and garden equipment, small off-road engines, marine engines, and portable emissions measurement systems.

ARB has no capacity at the El Monte facilities to conduct heavy-duty vehicle emissions testing or research. Heavy-duty testing is a major and growing need to further address diesel PM, NO_x, and GHG emissions. ARB entered into an MOU with MTA in 1998 for space to conduct limited heavy-duty motor vehicle engine emissions testing and research. Five ARB staff are assigned to the MTA facility. The MOU for the facility is subject to renewal in April 2015. Testing of heavy-duty vehicles and engines plays an important role in generating emissions data to support ARB's regulatory efforts related to reducing emission rates from heavy duty vehicles, in-use retrofitting of trucks with exhaust after-treatment devices, surveying criteria and non-criteria pollutants from emerging after-treatment technologies, and evaluating alternative fuels and fuel blends. The existing ARB capacity is not adequate to meet existing or future needs.

Table 1 summarizes the buildings and associated space in Southern California.

Currently, there is over 400 staff located in El Monte. In addition to the testing activities, the leased space support staff and activities related to enforcement, development of new emissions testing technologies, emissions inventory, planning, research, public information and outreach, and general program administration. Note that almost 60 percent of the space is leased and represents an ongoing cost to the state unless the facilities are consolidated. The lease costs alone are approximately $2 million dollars per year.

Over 90 percent of the staff located at the El Monte facilities either directly supports the testing activities, or frequently interacts with the staff directly supporting the testing activities. This interaction takes the form of developing or reviewing test plans, evaluating collected emissions data, or using the results of the emissions data for various purposes. For example, these purposes include regulatory development, mobile source emissions inventory, and air quality modeling used to support State Implementation Plan (SIP) requirements.

Table 1
Infrastructure Associated with ARB's Southern California Operations

Facility	Purpose	Square Footage	Lease Term
9530 Telstar Avenue Annex IV El Monte	Light-Duty Emissions Test Facilities, Main Auditorium, and General Office Space	13,871	Nov. 1, 2013 to Oct. 31, 2021
Haagen–Smit Laboratory 9528 Telstar Avenue El Monte	Light-Duty Emissions Test Facility, Chemical Laboratory, and General Office Space	53,797	State-Owned Facility
9500 Telstar Avenue Annex II El Monte	General Office Space	23,904	July 1, 2010 to June 30, 2018
9480 Telstar Avenue Annex I, Suite 1 El Monte	General Office Space	8,107	July 1, 2010 to June 30, 2018
9480 Telstar Avenue Annex I, Suite 4 El Monte	General Office Space	4,804	July 1, 2010 to June 30, 2018
9460 Telstar Avenue Annex III, Suite 1 El Monte	Portable Emissions Measurement System Testing Area and General Office Space	6,935	July 1, 2010 to June 30, 2018
9440 Telstar Avenue Annex V, Suites 7 & 8 El Monte	General Office Space	9,702	April 1, 2009 to March 31, 2017
9440 Telstar Avenue Annex V, Suite 9 El Monte	General Office Space	6,990	April 1, 2009 to March 31, 2017
LA Metro Transit Authority 470 Bauchet Street Los Angeles	Heavy-Duty Emissions Test Facility and Limited General Office Space	3,911	Operating under a Memorandum of Understanding; April 13, 2010 to April 13, 2015
TOTAL SPACE		**132,021**	

Table 2 summarizes the activities conducted by staff located in the Southern California facilities by functional unit (e.g. Division or Office).

Table 2
Staffing Allocations in Southern California

Division or Office	Number of Staff	Southern California Functions
Chairman's Office	13	Provide Overall Program Administration Provide Public Information Support Ombudsman Activities
Emissions Compliance, Automotive Regulations and Science Division	225	Develop Regulations Assess In-Use Compliance Conduct Emissions Testing and Research Assess Light-Duty Onboard Diagnostic System Operate Chemistry Laboratories
Mobile Source Control Division	59	Develop Regulations Assess In-Use Compliance
Monitoring and Laboratory Division	35	Develop Regulations Conduct Emissions Testing and Research Develop and Deploy Portable Emissions Measurement Systems Analyze Ambient Air Quality Samples
Air Quality Planning and Science Division	21	Develop Mobile Source Emissions Inventories Assess Emissions Data
Office of Information Services	5	Support Information Technology Needs
Enforcement Division	49	Enforce Regulations, Including the Statewide Heavy-Duty Truck and Bus Rule, Marine, Port, and Railroad Operations, Consumer Products, Vehicle Fuel Samples, and Certification Sale Requirements for New Engines, Vehicles, and Equipment
Administrative Services Division	7	Provide General Administrative Support
Total	**414**	

Need for ARB Facilities in Southern California

Historically, HSL was built in Southern California to ensure that there was a major state air pollution control regulatory presence in the most polluted region in the United States. The motor vehicle manufacturers also had a major presence in Southern California and either produced or imported new vehicles into Southern California through the region's major ports. The ports of Los Angeles and Long Beach (Ports) remain a major site for imported vehicles and are the largest individual sources of diesel emissions in the South Coast Air Basin. Therefore, having a local presence helps to ensure compliance with the various ARB regulatory measures and support other clean air and environmental justice initiatives. The location in Southern California also facilitates coordination with the South Coast Air Quality Management District—the largest local air pollution control district in the United States.

Current Scope and Accomplishments of Testing Operations in Southern California

For over four decades, emissions testing and research at the Southern California facilities has been the backbone of California's mobile source control programs. The testing has supported virtually every motor vehicle and engine regulation that the Board has adopted and is recognized throughout the world as providing high quality data and innovative solutions to address mobile air pollution sources. Many of ARB's mobile source test procedures and regulations have been adopted or adapted for use by the U.S. Environmental Protection Agency (U.S. EPA) and other air pollution control agencies in the United States and around the world.

Emissions testing and research conducted at the Southern California facilities addresses many different types of vehicles and engines. Sources tested include passenger cars, sport-utility vehicles, pick-up trucks, heavy-duty vehicles, large off-road vehicles, motorcycles, off-highway recreational vehicles (OHRVs), small off-road engines (SORE), outboard marine engines, transport refrigeration units, portable fuel containers, and refueling tanks. The testing covers many different air pollutants and GHGs. In addition, ARB conducts emission tests to support the adoption of fuel quality regulations.

The testing occurring now at the Southern California facilities is supporting a number of high profile actions that will occur in the next few years. These activities include: the update of SIPs for ozone and $PM_{2.5}$; the mid-term review of the light-duty vehicle emissions standards done in cooperation with the U.S. EPA and the National Highway Transportation Safety Administration; development of medium-duty and heavy-duty emissions standards (conducted at MTA); and, ongoing updates of the transportation element of the climate change scoping plan.

To support increased emissions testing and research and program needs, the Southern California facilities have been modified over the years. New testing and chemistry analysis instruments have been acquired and installed to enable testing of different types of equipment and performance of specialized chemistry analyses. The overall breadth of the testing and analysis capabilities has expanded in recent years. However, in many areas, the capability to test specific types of equipment and perform specific types of chemistry analyses remains quite limited due to space and other constraints of the existing facility. For example, ARB has no capability of testing heavy-duty engines in El Monte and only limited capabilities at the MTA facility.

The backbone of the emissions testing facility is the need for specialized equipment such as engine dynamometers, chassis dynamometers, and chambers specifically designed to measure

evaporative emissions from vehicles and other types of gasoline-powered equipment. These chambers are referred to as Sealed Housing for Evaporative Determinations, or SHEDs.

In standard emissions testing cycles, such as those that U.S. EPA defines, dynamometers are used to provide simulated road loading of either the engine (using an engine dynamometer) or full powertrain (using a chassis dynamometer). Emissions are measured during these test cycles. Dynamometers are expensive, but essential to obtaining dependable emissions information necessary for effective air quality oversight and associated regulatory efforts. These dynamometers range in cost from $1 million for a light-duty dynamometer to $3.5 million for a heavy-duty dynamometer. Equipping the dynamometer with the necessary emissions testing infrastructure for effective deployment adds up to $1.5 million to the purchase price.

SHEDs are vehicle-sized enclosures designed to capture VOC emissions from the fuel system of vehicles at rest or in operation. Standard test cycles involve maintaining a constant pressure while varying temperature and humidity within the sealed enclosure. This constant pressure requirement means the enclosure volume must expand and contract as the temperature rises or lowers, respectively, to maintain steady pressure. To assess emissions while operating, the SHED must have a chassis dynamometer.

The emission testing and research results are used for a broad range of ARB programs:

- Develop new and advanced methods for measuring emissions;
- Quantify and characterize emissions from various types of mobile sources;
- Evaluate the effects of different fuel formulations on engine emissions;
- Prepare emission inventories;
- Conduct research on new emission control technologies and new vehicles;
- Develop new regulations and update existing regulations;
- Assess vehicle and engine manufacturer compliance with existing regulations; and
- Assess the regulatory compliance of aftermarket parts.

In support of special studies, the emissions testing and research in Southern California is accomplished in collaboration with academic institutions, other regulatory agencies, or automotive industry clients.

One of the first studies conducted at HSL in the 1970s established the feasibility of catalytic converters to reduce emissions of NO_x, VOCs, and carbon monoxide for light-duty cars. This study led to the regulatory requirement that all gasoline-powered passenger cars and trucks have catalytic converters. There are many other specific accomplishments associated with the emissions testing and research conducted at the Southern California facilities. The following list provides a sampling of some of the range of accomplishments.

- Performed testing of diesel particulate filter prototypes that could be used to reduce diesel PM emissions on heavy-duty vehicles by over 90 percent. The testing resulted in the Board adoption of retrofit requirements for heavy-duty vehicles. Emissions were reduced much sooner than if reductions were based on natural vehicle turnover.
- Performed emissions testing of hybrid and conventional vehicles in support of the U.S. EPA's presidentially mandated first ever heavy-duty vehicle GHG emission standards rulemaking (HD-GHG Phase I).
- Conducted several test projects to provide critical data for the development and adoption of more stringent particulate matter standards for light- and medium-duty vehicles.

- Evaluated system failures of selective catalytic reduction (SCR) systems used to reduce the emissions of NO_x. Based on the results, the manufacturers optimized SCR operations, resulting in reduced emissions from many new on-road heavy-duty vehicles.
- Tested the effectiveness of catalysts on compressed natural gas (CNG) vehicles to reduce the emissions of formaldehyde, a known toxic air contaminant. The testing resulted in an ARB requirement for oxidation catalysts on heavy-duty CNG vehicles.
- Tested pleasure craft engines in support of Board adoption of more stringent regulations, reducing both emissions and the amount of oil and fuel discharged into water bodies.
- Conducted evaporative emissions testing of off-highway recreational vehicles, resulting in the Board adoption of new test procedures and emission standards.
- Identified through evaporative emissions testing that portable gasoline containers lose a significant amount of VOC emissions through the container itself. As a result, the Board adopted new test procedures and emissions standards for portable gasoline containers.
- Tested small engines such as weed trimmers and chain saws, resulting in the Board adoption of regulations.
- Performed testing of the emissions effects of various blends of biodiesel and renewable diesel on heavy-duty vehicles. The results are being used to help ARB develop specifications for alternative diesel fuels in support of ARB's Low Carbon Fuel Standard.
- Identified a critical vulnerability in a plug-in hybrid vehicle (PHEV) emission control technology that sparked new developments and changes in ARB's PHEV regulations.[11]
- Developed innovative strategies for onboard diagnostic (OBD) systems. These systems detect virtually every electrical and mechanical malfunction that can increase in-use vehicle emissions. The systems are now used extensively in Smog Check programs.
- Conducted in-use compliance testing of various engine families, reducing failure rates from almost 50 percent in the 1980s to 10 percent today. This testing forces manufacturers to produce durable emission control designs for their vehicles.
- Identified failures of the onboard diagnostic systems in several vehicle models, resulting in the correction of over one-half million vehicles and over $7 million dollars in fines.
- Over the last 30 years, required the recall of about two million vehicles based on the results of the in-use compliance program, resulting in emissions benefits equivalent to removing 400,000 vehicles from the road.
- Tested both on-highway and off-road motorcycles and recreational vehicles, resulting in the vehicles being redesigned or not sold into the state.
- Identified several poor quality aftermarket catalysts for light duty-vehicles resulting in their removal from the market.
- Developed new test methods demonstrating that ultralow emission levels of particulate matter (one milligram/mile) could be precisely and accurately measured. To better understand particulate matter formation, conducted several collaborative test projects with top researchers to measure semi-volatile organic compounds in vehicle exhaust and study the formation of secondary particulate matter aerosols.
- Over the years, tested thousands of mobile sources to provide data supporting and updating ARB's emissions inventory and enhancing air quality improvement efforts.
- Annually analyze more than 10,000 samples to support Enforcement Division's fuel and marine investigation programs.

[11] A plug-in hybrid vehicle is a vehicle that uses rechargeable batteries, along with an internal combustion engine. The plug-in vehicle can be restored to a full charge by connecting a plug to an external electric power source.

Future Increased Need for ARB's Southern California Emissions Testing and Research Programs

ARB's emissions testing and research programs will continue to play a critical role in providing the necessary scientific foundation for meeting the state's federal air quality mandates and climate change requirements. In the future, specific emissions testing and research activities must:

- Develop new and innovative technologies to reduce VOCs, NO_x, and GHG emissions from all mobile sources, particularly diesel-powered vehicles and engines.
- Ensure that existing regulations are achieving their intended benefits through extensive in-use compliance testing and enforcement activities.
- Develop advanced testing methods that are capable of assessing the latest technologies, including near-zero vehicles and engines.
- Provide updated emissions inventory data for the range of in-use mobile sources to ensure that there is an accurate basis for developing SIPs and determining GHG emission reductions.
- Conduct the highly specialized chemical analyses necessary to support the emissions testing and research needs and other efforts, including air quality modeling.
- Conduct increased emissions testing and research into alternative fuel formulations and their impact on mobile source emissions in support of the Low Carbon Fuel Standard.
- Ensure that aftermarket parts meet the emissions and durability requirements of the original equipment manufacturers.
- Conduct testing on light-duty and heavy-duty zero emission vehicles to ensure that in-use operation of these vehicles is representative of the reported range and durability of the vehicle.

Internal combustion engines will continue to dominate the vehicle fleet for years. To meet long-term climate change goals, ARB has identified that 100 percent of all new light-duty vehicle sales should be zero emission vehicles by 2040. However, even under this 2040 scenario, over one-half of the vehicle fleet will still be using internal combustion engines. Therefore, ARB must continue to ensure that these vehicles are achieving intended benefits. Furthermore, the advanced hybrid vehicles and zero emission vehicles also will require testing to ensure that the vehicles are operating as intended and maintaining appropriate durability requirements. The zero emission vehicle program will be successful in achieving climate and air quality benefits only if vehicles are useable, robust, and durable over the life of the vehicle. Otherwise, consumers will continue to purchase conventional vehicles. For example, on the light duty side, the car manufacturers are arguing that they do not need to replace seriously deteriorated hybrid batteries under warranty because the worst case criteria emissions are certified without the battery at all. This twisted logic completely negates the climate change benefits of the hybrid vehicle. ARB needs to conduct the necessary performance and durability testing of these vehicles to understand and advance both the hybrid and zero emissions technologies.

Diesel-fueled vehicles dominate the heavy-duty fleet. ARB has identified diesel PM as a toxic air contaminant. Diesel-fueled vehicles are responsible for over 97 percent of all diesel PM emissions. Recent health data indicates that the toxicity of diesel exhaust is

almost three times higher than previously estimated with children being particularly vulnerable. In addition, these vehicles are significant contributors of NO_x, a major smog-precursor. Finally, these vehicles have unexploited potential for efficiency gains and the resultant GHG emission reductions.

The onboard diagnostic system (OBD) program includes light-duty and heavy-duty vehicles. These systems are important SIP measures. Further, per California legislation,[12] a query of the light-duty OBD system is now the main inspection mechanism used in California's Smog Check program to identify failing vehicles. ARB expects that OBD will also be the future mechanism for more effective heavy-duty vehicle inspections. In the future, ARB's emissions testing capabilities will play a critical role in ensuring that these systems are working effectively by conducting extensive failure mode testing. ARB has become the national leader and has a dominant presence in the worldwide emissions diagnostics community. Many jurisdictions base their diagnostics programs on a subset of the California requirements and some accept California OBD system certification in lieu of meeting their requirements (e.g., the U.S. EPA, Mexico, and Canada).

Portable Emissions Measurement Systems (PEMS) are an emerging advanced emissions testing technique that is used to provide real-world emissions results under various test conditions. They can be used on a wide variety of equipment, including, but not limited to, light-duty vehicles, heavy-duty vehicles, motorcycles, off-road equipment, and marine engines. They can also be used in specialty applications to support in-use compliance, innovative technology evaluations, emissions inventory development, and regulatory development. However, direct measurements of PEMS are currently limited to a few pollutants such as NO_x and PM.

To support emissions testing and research, ARB maintains a sophisticated chemical laboratory at HSL. In the future, ARB's laboratory operations will be challenged to develop standard test methods for new pollutants that may be regulated, such as ultrafine particles and black carbon. Beginning in 2020, the need for particulate matter mass determinations will increase due to the growth of testing needs in a number of areas, including in-use compliance and regulatory development. In addition, ARB expects to increase the capacity to analyze trace metals emissions. Metals analysis is a highly specialized analytical procedure that requires extremely clean rooms due to the very low levels present.

The complexity of the technology being produced by manufacturers to meet ARB's increasingly stringent emission standards demands the ability to quickly evaluate any system performance issues to determine potential impacts to regulatory compliance, inventory, and research needs. This circumstance is particularly true with the emerging near-zero emission vehicle technologies.

Without sufficient facilities, ARB would be forced to conduct testing under contract, eliminating the flexibility to address the most urgent data needs as they present themselves. A contractual approach to testing would also put ARB's regulatory development and compliance programs at the mercy of the contractor's schedule and priorities that may not be the same as ARB's priorities. While ARB does contract out to various facilities, the costs can be quite high. In one recent contract, the costs to conduct tests were $15,000 to $20,000 per test compared to ARB's

[12] Assembly Bill 2289, Eng 2010, Chapter 258, Health and Safety Code section 44001.1.

estimated cost to do the same tests of $10,000.[13] However, due to capacity limitations of the existing facilities, ARB was forced to contract out the work. As another example, ARB recently contracted with West Virginia University to supplement ARB testing on PEMS units.[14] In this case, the hourly costs were on the order of $555 per test compared to $115 per test for ARB evaluations. Again, current capacity limitations precluded ARB from conducting this testing.

Regulatory measures, particularly technology forcing regulations, are controversial and often become the subject of legal challenges by the regulated community. The test data supporting the regulatory action must be sufficient to withstand legal review.

Infrastructure Deficiencies

Infrastructure Needed to Address Program Needs

A new Southern California facility would provide the necessary capacity to address evolving program needs, as well as continue to ensure that existing programs are achieving intended emissions reductions and other benefits. To address these program needs, ARB is proposing an expansion and consolidation of the Southern California facilities. Table 3 summarizes the space increases proposed to address the various program needs. The infrastructure deficiencies and specific justifications follow.

Table 3
Comparison of Existing and Proposed Space Needs for ARB Programs

Program Area	Existing Southern California Facilities square feet	Proposed Southern California Facilities square feet
Light-Duty Testing	43,500	91,171
Heavy-Duty Testing and Onboard Diagnostic Systems	4,000	62,316
Portable Emissions Measurement Systems	2,250	6,683
Chemistry Laboratory	17,250	48,016
Staff Offices and Shared Operations	55,000	72,702
Administrative Services	10,000	18,365
Total Building	**132,000**	**299,250**
Parking and Outside Facilities	57,500[a]	310,590
Total Space Requirement	**189,500**	**609,840**

[a] Includes only parking associated with HSL and Annex 4.

[13] 2014 Southwest Research Institute (SWRI), Low-NO_x Project. ARB has contracted with SwRI to perform engine dynamometer emissions testing of prototype diesel and CNG heavy-duty engines to demonstrate feasibility of NO_x emissions at 1/10th the current NO_x emission standard. This proof-of-concept project is an important underpinning to justify lowering the existing NO_x standard so California can achieve the federal air quality standards.

[14] 2014 West Virginia University Cross-California PEMS Project. ARB is studying the relationship between certification standards and actual in-use emissions from heavy-duty vehicles using PEMS. Previous ARB testing has shown that vehicles emissions performance can be markedly less outside of the certification test procedures. This project will record loaded semi-truck emissions continuously during operations over California roadways. The intent is to capture all the entire emissions activity of each vehicle over several working days while spanning a variety of real-world operating duty cycles. This kind of detailed emissions information is invaluable to effective and efficient regulatory development.

As Table 3 shows, ARB is proposing to add additional space for light-duty testing, heavy-duty testing, portable emissions measurement systems, a chemistry laboratory, office and shared space, administrative services, and parking and outside facilities. Justifications are provided below for each area.

Light-Duty Testing

The existing El Monte facilities have six light-duty/medium-duty test cells to conduct exhaust emission testing. Each test cell has a chassis dynamometer. The six test cells all have standard gaseous and PM emissions testing capability. Five of the standard test cells are for passenger cars and sport utility vehicles and one is for motorcycles and all-terrain vehicles. Between the five passenger car test cells, staff conducts approximately 1,500 standard exhaust emissions tests annually.

The number of test cells is adequate to perform the needed light-duty vehicle testing. The proposed test cells are approximately 1,900 square feet each as opposed to the existing 1,360 square feet. The increased space is due to the need for additional sampling and analysis equipment required to conduct the tests. There is also a need to increase the efficiency of how ARB staff uses the test cells. In order to maximize the light-duty testing, ARB is proposing to add two new light-duty preparatory test cells (prep cells) equipped with chassis dynamometers, but no emissions measurement equipment. The prep cells would be used to perform various vehicle preparation activities that, per federal requirements, must be done prior to the actual testing. The prep cells would also serve as back-up test cells if any other test cell is offline for extended maintenance, equipment repair or replacement. By relieving the test cells from the majority of prep activities, the test cells can be dedicated to testing; this should increase the new facility capacity to over 2,000 standard tests per year. The additional capacity is needed to support expanded in-use compliance testing of new engine families, increased OBD audits, research, and new vehicle audits. The current testing and testing expected in 2020 is shown in Table 4. Note that the emissions inventory and regulatory development testing is expected to remain basically the same as it is now.

Table 4
Current and Future Light-Duty Chassis Dynamometer Testing Needs

Program Support	Number of Annual FTP Tests Current	Percent of Total Annual Tests	Number of Annual FTP Tests 2020	Percent of Total Annual Tests
Emission Inventory	779	50%	779	38%
Regulatory Development	389	25%	389	19%
In-use Compliance	78	5%	250	12%
Aftermarket Parts Evaluation	156	10%	156	8%
Research	156	10%	300	14%
OBD Audits	0	0%	200	10%
New Vehicle Audits	0	0%	50	2%
All	**1,558**	**100%**	**2,174**	**100%**

ARB currently operates three SHEDs for at-rest evaporative emissions testing. These SHEDs measure evaporative emissions from a variety of sources including motor vehicles, small off-road equipment, and marine pleasure craft. At-rest evaporative emissions occur when a vehicle is parked after driving while the engine is warm (Hot Soak Test) and during a twenty-four hour period that simulates the temperatures that may occur over a full day (Diurnal Test). In addition, ARB operates a running loss SHED (RL-SHED) with a chassis dynamometer. The existing RL-SHED is used primarily for measuring motorcycle evaporative emissions while driving.

The new Southern California facility would include the same number of at-rest SHEDs and an advanced RL-SHED with enhanced environmental controls. This advanced RL-SHED, referred to as an Environmental Chamber, allows for expanded testing capabilities. These include running loss evaporative emissions testing on passenger cars and light-duty trucks and exhaust emissions testing under simulated operating conditions that may occur when the air conditioner is on or the vehicle is operating in colder temperatures. There are emissions standards that must be met under these conditions, but ARB has no ability to verify compliance. These types of tests cannot currently be done in the El Monte facility because the existing RL-SHED was not designed to conduct those tests and an additional chamber cannot be added due to physical limitations of the building.

The current SHEDs have generally reached the end of their service life. Therefore, testing production is expected to increase at the future test facility due to less downtime for repairs, especially for leak repairs that are difficult and time consuming to perform. A twenty-five percent increase in evaporative emissions testing is projected for the new SHEDs. The Environmental Chamber with full running loss test capabilities and enhanced environmental controls will provide ARB the ability to conduct running loss evaporative emission tests on more than motorcycles and verify compliance with additional emissions standards. Due to expanded capabilities of the Environmental Chamber, running loss evaporative emissions testing is expected to decrease, but exhaust emissions testing of operation during defined operational modes is expected to increase. Table 5 summarizes the current testing and testing expected in 2020 for the SHEDs. Table 6 summarizes the current testing and testing expected in 2020 for the Environmental Chamber.

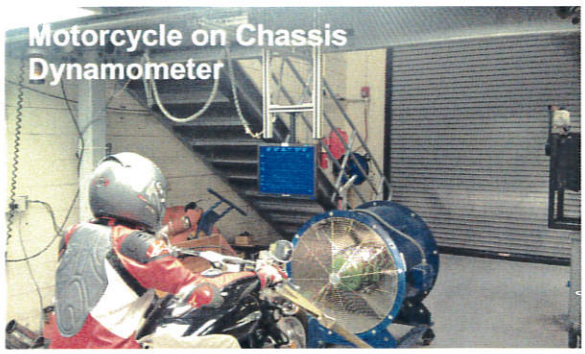
Table 5
Current and Future SHED Testing

Current SHED	Total Annual Hot Soak Tests Current	Total Annual Diurnal Tests Current	Future SHED	Total Annual Hot Soak Tests 2020	Total Annual Diurnal Tests 2020
SHED 1	38	38	SHED 1	48	48
SHED 2	38	38	SHED 2	48	48
SHED 3	38	38	SHED 3	48	48
Total	**114**	**114**	**Total**	**144**	**144**

Table 6
Current RL-SHED and Future Environmental Chamber Testing

Current RL-SHED	Total Annual Running Loss Evap Tests Current	Total Annual A/C Exhaust Tests Current	Total Annual 20°F/50°F Exhaust Tests Current	Future Environ-mental Chamber	Total Annual Running Loss Evap Tests 2020	Total Annual A/C Exhaust Tests 2020	Total Annual 20°F/50°F Exhaust Tests 2020
RL-SHED 1	55	N/A	N/A	Envir-Chamber	18	118	44
Total	**55**	N/A	N/A	**Total**	**18**	**118**	**44**

Motorcycles and small off-road engines are also included in the light-duty testing space needs analysis. Currently, ARB has one motorcycle/all-terrain vehicle chassis dynamometer and three small off-road engine dynamometers all housed in one test cell. However, the test cell has only one sampling system that is shared among all four dynamometers. This limits the total capacity to approximately 200 FTP tests annually.



In support of the motorcycle program, ARB needs one prep cell with a chassis dynamometer but no emissions measurement equipment, two test cells with chassis dynamometers and emission measurement equipment, and one evaporative emissions chamber already accounted for in the previous section. In support of the small off-road engine program, ARB needs one engine test cell with three engine dynamometers and shared emissions measurement equipment. Adequate space is necessary to house these units. With these changes, the overall capacity will increase to almost 1,000 FTP tests per year, representing about a five-fold increase. The current testing and testing expected in 2020 is shown in Table 7.

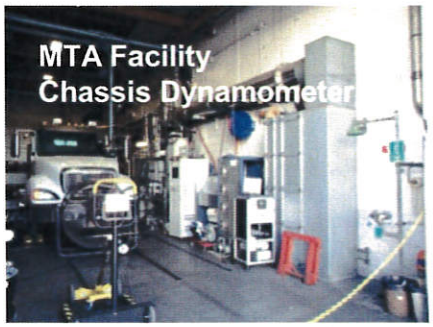
Table 7
Current and Future MC and SORE Testing Needs

Motorcycle and Small Off-Road Equipment Program Support	Number of Annual FTP Tests Current	Percent of Total Annual Tests	Number of Annual FTP Tests 2020	Percent of Total Annual Tests
Emissions Inventory	0	0%	400	41%
Regulatory Development	35	17%	88	9%
Aftermarket Parts Evaluation	14	7%	31	3%
New Equipment Audits	106	50%	280	28%
Research	56	26%	192	19%
All	**211**	**100%**	**991**	**100%**

The space associated with the test cells and SHEDs amounts to approximately 40 percent of the light-duty testing space needs. Another 35 percent of the total space needs is associated with providing an area that acclimates the vehicles and equipment prior to testing. This area, referred to as the breezeway and cold soak area, must be temperature controlled to comply with federal test procedure requirements. The space accommodates 30 vehicles; the current space accommodates only 12 vehicles. The additional space will debottleneck the existing testing schedules and allow for more efficient and higher volume testing, as well as providing space for test cell and SHED support functions. These functions include a fueling room, an indoor lift for vehicle repairs, test cell control rooms, a vehicle repair diagnosis area, parts storage, and staff offices.

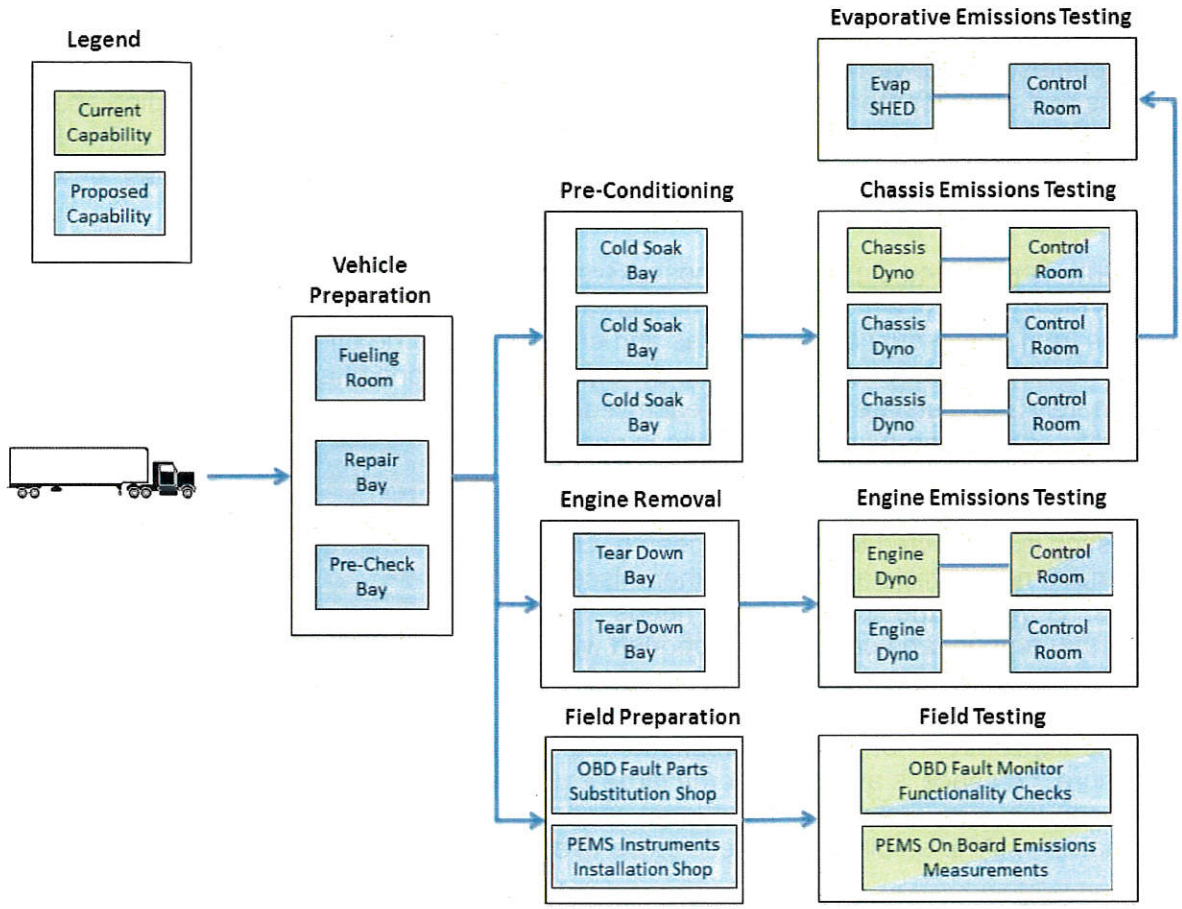
Heavy-Duty Testing and Onboard Diagnostic Systems

The MTA facility cannot accommodate the increased testing anticipated to address the emissions from heavy-duty diesel vehicles and engines and large off-road engine programs. The MTA facility currently has one engine dynamometer and one chassis dynamometer. Approximately 240 tests are conducted each year at the MTA facility. About one-third of the testing is done to support regulatory development and one-quarter of the testing is done to support the emissions inventory. The rest of the testing is conducted to support research, OBD development, new vehicle audits, and other miscellaneous programs. However, the current testing needs are about 10 times that amount and cannot be supported with the existing facilities. For example, model year 2010 certification requirements in 40 CFR 1065 require environmental controls not presently implemented at MTA. Furthermore, no space is available for the large equipment required. In addition, ARB has no ability to conduct evaporative testing of large spark ignition vehicles and equipment. This greatly hampers ARB's ability to address these evaporative emissions sources.



Therefore, ARB needs to add significant capacity to meet program needs. In support of this program, ARB needs two engine dynamometers, two emissions-based chassis dynamometer, and one chassis dynamometer. In addition, ARB needs to add a heavy-duty SHED to conduct evaporative emissions testing of large gasoline-powered heavy-duty engines. Adequate space is necessary to house these units. Figure 1 presents the changes graphically. The justification for this equipment is provided following the graphic.

Figure 1
Summary of Proposed Heavy-Duty Testing Changes



- *Emissions-Based Engine Dynamometer*. ARB currently operates one heavy-duty engine dynamometer at the MTA facility and is proposing to provide space for two engine dynamometers in the new facility. The certification requirements for heavy-duty on-road vehicles and off-road equipment are written in terms of engine dynamometer emissions test results, not the testing of the entire vehicle as is done for passenger cars. Engine dynamometer testing involves mounting the engines, supplying the missing vehicle systems (fuel, cooling, load, control signals), and measuring the exhaust components. ARB would then have the capacity to conduct approximately 150 tests per year per dynamometer beginning in 2020. The test projects to be conducted on the dynamometers would support the following programs.
  - 30% Regulatory Development: ARB anticipates developing new regulations that allow for emission standards that are not based on expensive and time-consuming engine dynamometer testing. In addition, testing is required to support the next iteration of NO_x and GHG emission standards for heavy-duty engines.
  - 50% In-use Compliance: Testing of existing heavy-duty engines to determine compliance with emission standards and OBD and warranty requirements.
  - 20% Fuel Quality: Testing of heavy-duty engines to determine the impact of different alternative and renewable liquid fuels on emissions.

- *Emissions-Based Chassis Dynamometers.* ARB currently operates one heavy-duty two-wheel drive chassis at the MTA facility. The current chassis dynamometer is incapable of conducting powertrain system testing. It cannot test dedicated four-wheel-drive vehicles or many modern vehicles that require cooperation with the original equipment manufacturers to properly disable the vehicle's wheel speed monitoring systems including anti-lock brake systems, electronic stability control systems, automatic transmission shift controllers and hybrid powertrains. Furthermore, testing complete vehicles is becoming more important with the increasing complexity of the engines. The existing two-wheel drive dynamometer is becoming obsolete due to the need for vehicle controls to recognize that all wheels are spinning simultaneously.

  The future pair of emissions chassis dynamometers will provide all wheel drive capability required for modern vehicles and hybrid vehicle systems. ARB expects to ramp up the testing to over 700 tests per year beginning in 2020. The test projects to be conducted on the dynamometers would support the following programs.

  25% Regulatory Development: Support the transition to emission standards that are not based on engine dynamometers by comparing chassis dynamometer results to engine dynamometer results.

  25% Emissions Inventory: Build a new surveillance program to test heavy-duty vehicles to establish in-use emission factors for a variety of engine families and existing and new technologies. This testing is currently not being done due to the limited testing capability, but is critical to establishing an accurate emissions inventory.

  35% In-use Compliance: Conduct screening tests to identify potential engines that are exceeding emissions standards. These engines would then be sent to the engine dynamometers for confirmation testing pursuant to the standardized test procedures. Also, evaluate and quantify the benefits of the implementation and maintenance programs for heavy-duty vehicles.

  10% Technology Development: To support the climate change program, evaluate the emerging hybrid and near-zero technologies.

  5% Aftermarket Parts Evaluations: The heavy-duty program is highly dependent on emission control technologies such as diesel particulate filters for $PM_{2.5}$ and selective catalytic reduction (SCR) for NO_x. Therefore, it is essential to evaluate the aftermarket supplies of these devices to ensure that they achieve the intended emissions benefits and satisfy the required durability standards.

- *Chassis Dynamometer.* The third chassis dynamometer would not be equipped with emissions sampling systems, but would be used for a variety of purposes as noted below. ARB expects to conduct approximately 160 tests per year beginning in 2020 using this dynamometer.

  45% Onboard Diagnostic Systems. Evaluate OBD systems on heavy-duty vehicles to determine if the OBD monitors are working as intended. Performing OBD monitor trigger evaluations on the dynamometer allows for repetition of the same conditions and avoidance of traffic hazards associated with over the road testing.

  40% Technology Development. Conduct testing to support ARB's sustainable freight plan by assessing the technologies necessary to commercialize fuel cell and battery electric heavy-duty vehicles. This testing will help provide quantified range and capability information for new and in-use zero emission vehicles and will help clarify conflicting stakeholder claims with respect to ARB's zero emission programs.

  15% Vehicle Preparation. Optimize testing on the two heavy-duty chassis dynamometers by exercising heavy-duty test vehicles in preparation for emissions testing.

- *Heavy-Duty SHED.* ARB currently has no ability to conduct evaporative VOC testing of heavy-duty large spark ignition vehicles and equipment due to size limitations of the existing SHEDs. A heavy-duty SHED is necessary to support future evaporative emission requirements and test procedures for heavy-duty vehicles using alternative fuels, such as compressed natural gas, liquefied natural gas, and liquid petroleum gas. The SHED is also needed to support in-use compliance testing of heavy-duty vehicles, which is not currently being performed. The anticipated utilization of the HD SHED is between 8 to 10 projects per year beginning in 2020. The test projects to be conducted on the dynamometers would support the following programs.
  - 50% Regulatory Development. Conduct evaporative emissions testing of medium-duty heavy-duty gasoline-powered spark ignition vehicles and engines, including larger marine engines and large off-road equipment, for the purposes of establishing new emission standards.
  - 25% In-Use Compliance. Conduct evaporative emissions testing of various heavy-duty engines to assess compliance with existing emission standards.
  - 25% Emissions Inventory. Conduct evaporative emission testing of various heavy-duty engines to develop emission factors for existing and new engines.

ARB currently does not have a dedicated secure workshop space for preparation of OBD test vehicles. OBD testing is done in a makeshift manner using a variety of test cells to conduct the testing. A workshop space is needed to sequentially install "calibrated threshold failure" parts onto vehicles and engines to challenge the functionality of individual OBD monitors near emissions thresholds. This workshop needs provisions for parallel mechanic activities on two vehicles, ready access to test instrument and tool storage, and space for project-specific test parts. Both light-duty and heavy-duty OBD on-road testing will be supported as well as OBD testing in the adjacent dynamometer test cells. The sequential testing of OBD monitors requires substantial test time per project. ARB anticipates that this workshop will be the operational base for 320 vehicle days of on-road testing allowing thorough evaluation of up to ten vehicles per year or partial evaluation of a broader range of vehicles. Resources will be divided across the OBD programs of new OBD application approvals, confirmatory testing of in-use vehicles, and regulatory development work.

The space associated with the test cells and the SHED amounts to approximately 30 percent of the heavy-duty testing space needs. Another 10 percent of the total space needs is associated with providing a cold soak area for test vehicles. The remaining 60 percent of the space needs is associated with test cells and SHED support functions. These functions include a fueling room, a pre-check vehicle diagnostics area, test cell control rooms, OBD staging areas, parts storage, and staff offices.

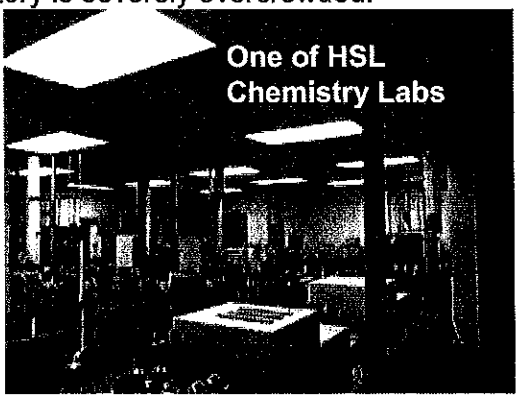
Portable Emissions Measurement Systems

ARB is currently performing its PEMS evaluation work in a leased building that is designed as a storage area. There is no indoor vehicle staging area so every vehicle must be pulled up to the storage area for staging and testing. This scenario presents logistical issues in the summer due to heat exposure and in the winter due to electrical issues. Therefore, ARB must provide proper, secure, and dedicated space for this testing. ARB currently has five different PEMS tailored to different needs and therefore having slightly different capabilities. ARB is continuing to develop additional PEMS capabilities, but space is limited. ARB expects to add additional capabilities in the future. Adequate space is needed to support the development

and testing utilizing these PEMS units to ensure that the emission measurements are traceable to an accepted standard and also to ensure that vehicles operating under "real-world" conditions are meeting their allowable emissions standards. ARB expects to increase its PEMS use three-fold from about 5,000 test-hours per year now to about 14,000 test-hours per year beginning in 2020. We also expect PEMS to play an even greater role beyond 2020 once the product development and confirmation testing has occurred.

Chemistry Laboratory Operations

ARB is proposing a substantial increase in the space for laboratory operations. This space is necessary for several reasons. First, the existing laboratory is severely overcrowded. Equipment has been added to support various programs, but there has been no correlating increase in space. In addition, there is a need to separate out various analytical areas to ensure that there is no cross contamination between analytical operations. Finally, there are a number of new analyses expected in the future that require dedicated space. This includes, but is not limited to, the highly specialized metals analysis, the low level measurement of particulate matter, and the measurement of cetane number, a key property of diesel fuel quality. Approximately 15 percent of the space needs are allocated to staff offices.



Staff Offices and Shared Space

The existing space does not meet existing standards for space allocation pursuant to the Department of General Services. To meet these standards, the space allocation for staff offices and shared space is increased from approximately 35,000 square feet in the current facilities to about 73,000 square feet in the new facility. Approximately 20 percent of the staff space allocation is distributed throughout the other program areas. The remaining is included in this program area.

Shared space includes reception areas, a library, general storage rooms, conference rooms, an auditorium, and information technology network rooms. Shared space also includes staff amenities such as an employee lunch area with vending machines, a room for exercise equipment, locker rooms and showers, and space for a small childcare center.

Administrative Services

Administrative services include functions such as receiving and shipping, central cylinder storage, record storage, supply storage, mail room, reproduction, and a centralized warehouse and supply area.

Sitework

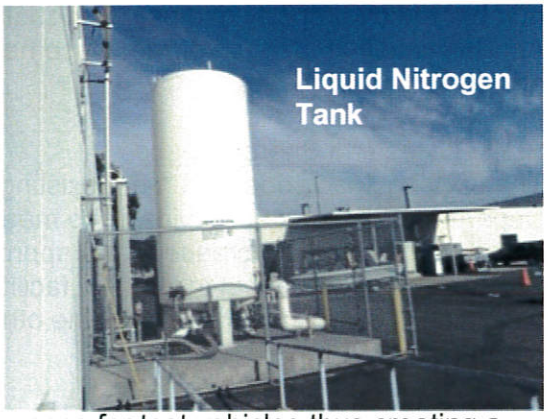
Sitework includes all of the area that supports the program areas. This includes secured parking for fleet and test vehicles, storage for our fuels analysis mobile laboratory, hazardous waste storage, a large liquid nitrogen tank, outdoor fuel pumps and underground tanks, drum storage, bicycle lockers.

Parking
Parking includes staff and public parking. To support electric vehicles, ARB expects to include 70 level 2 charging stations and 38 level 1 charging stations. ARB envisions a multi-story parking structure encompassing about 184,000 square feet.

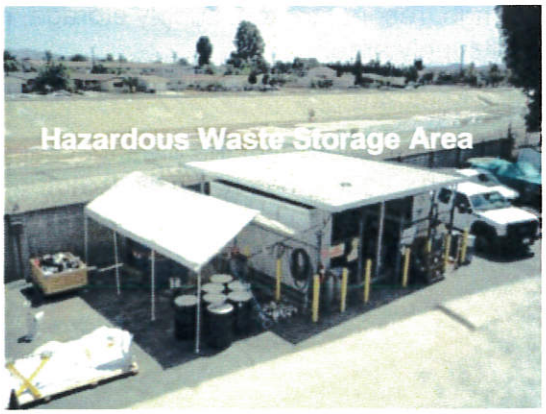
Existing Infrastructure Deficiencies

A new facility is needed to take ARB into the next generation of advanced motor vehicle technologies and advanced testing capabilities. The building has aged and technologies have changed significantly making the building systems inadequate to support the necessary emission testing operations in the future. This has resulted in significant operational costs and spotlighting the state-owned HSL as one of the major users of energy among state-owned properties. ARB continues to expend funds each year to maintain operations, but these fixes are temporary. In addition, ARB has outgrown the facility. This has resulted in the need to make costly changes to HSL and lease adjacent facilities to accommodate a growing organization.

The following list summarizes critical infrastructure deficiencies with the existing El Monte facilities.



- ARB is a recognized leader in air quality emissions testing, emissions regulation, and air pollution and climate change mitigation in the world and yet DGS has identified HSL as the one of highest energy users in the state.
- The bulk liquid nitrogen tank is located on another tenant's land and ARB is dependent on a third party for continued access.
- In some cases, vehicles must be physically pushed by hand over 300 feet from one test cell to another test cell in a very short time period to meet federally mandated testing procedures.
- There is an insufficient number of outside parking spaces for test vehicles thus creating a bottleneck in emissions testing.
- ARB cannot host major Board hearings or other important large meetings at the El Monte facilities that impact southern California stakeholders as the facilities lack an adequately-sized auditorium and have an insufficient number of outside parking spaces.
- The fire suppression system is antiquated and inadequate, potentially putting millions of dollars of specialized testing and laboratory equipment at risk.
- The hazardous materials associated with the Laboratory pose a potential risk to the Rio Hondo River which is a tributary of the Los Angeles River that abuts the back of the site.
- The buildings were built with asbestos insulation and fire retardant; this poses additional costs and potential public health issues to the staff during building remodels or tenant improvements.



- There is insufficient outdoor space for large vehicle circulation, shipping and receiving, and hazardous material storage.
- The facility lacks a central loading dock or shipping/receiving area.
- Gas cylinder storage is decentralized and in some cases is a long distance away from in-use locations creating delays and decreasing productivity.
- The network room lacks adequate space to accommodate equipment.
- The facility fails to comply with current standards outlined in the Americans with Disabilities Act of 1990 (ADA).
- The building lacks the capacity to adjust to emerging information technology needs.

The following list summarizes critical infrastructure deficiencies with the MTA facility.

- The facility lacks a sink area, necessitating the use of an eye wash station.
- Storage is placed outside of ARB space.
- ARB is unable to expand operations due to MTA's competing needs.
- ARB's testing schedule is frequently interrupted by MTA activities.
- Space has become very limited to adequately perform mission critical testing.
- The facility lacks an engine dynamometer set-up area, a workshop/fabrication area, and true office space to hold staff or client meetings.
- Severe dust infiltration poses a risk to instrumentation.
- The facility lacks the ability to conduct temperature-controlled testing.
- There is inadequate parking for vehicles and staff.
- The remote distance from the El Monte facilities impacts staff productivity, collaboration, and cohesiveness.
- The remote distance also impacts support and client needs (information technology and administrative support, client meetings).
- There are logistical challenges related to sample analyses; all samples must be delivered to HSL within a 4-hour window.
- The office area does not comply with ADA standards.
- The site is over-exposed to local ambient pollution sources (CNG defueling station, uncontrolled diesel trucks, four mainline railroad tracks, a rail/truck intermodal yard, and a future gas station planned for adjacent bay).
- The current MOU that ARB operates under does not specifically allow facility improvements or expansion thus impacting our ability to meet future program and regulatory needs.

B. RELATIONSHIP TO THE STRATEGIC PLAN

This project is consistent with ARB's strategic plan. ARB has longstanding statutory authority to attain and maintain healthy air quality; reduce the public's exposure to toxic air pollutants, conduct research into the causes of and solutions to air pollution; and systematically attack the serious problems caused by motor vehicles. Most recently, ARB was given the overall responsibility for reducing emissions of GHG pursuant to AB 32. Furthermore, the federal Clean Air Act recognizes California as the only state in the nation authorized to adopt motor vehicle emissions standards that are more stringent than the federal standards. This authority recognizes California's unique and persistent air quality problems and its ability to establish stringent motor vehicle standards through effective research and development programs.

This proposal is necessary to continue to meet the aforementioned federal mandates and statutory requirements.

C. ALTERNATIVES

1. *Replace the Existing Southern California Facilities with a New Facility*

Description. This alternative involves relocating and consolidating the state-owned Haagen-Smit Laboratory and adjacent leased space in neighboring buildings in El Monte, and remote MTA site in Los Angeles to a new LEED-Platinum certified facility. While the Southern California facilities have admirably served the air pollution and climate change program needs of the state since operations began in 1971, the facilities are obsolete, are deficient in space as defined by DGS space allowance standards, and can no longer meet ARB's long-term needs. ARB expects that the facility would be located on a piece of state-owned land in Pomona, California. There are three different options for constructing a new facility, as discussed below.

a. *Construct a new facility through the capital outlay process using the design-build procurement process.*

Scope. This option consists of the state developing performance criteria. Once the criteria are established, a design competition is initiated among interested contractors, with the winning contract based on price, technical qualifications, or a combination of the two. The successful contractor would then provide both design and construction services.

Cost and Schedule. The IBI Group has provided an estimate of the direct project costs. These are summarized below in Table 8 and are based on the design-build procurement approach. These provide the basis for subsequent DGS project cost analyses.

Table 8
Summary of the Direct Costs for the New ARB Southern California Facility

Program Area	Estimated Square Footage	Estimated Cost Per Square Foot	Estimated Cost
Light-Duty Testing	91,171	$487.05	$44,404,800
Heavy-Duty Testing	62,316	$650.75	$40,552,100
Portable Emissions Measurement Systems	6,683	$382.17	$2,553,900
Chemistry Laboratory	48,016	$694.63	$33,353,400
Offices and Shared Operations	72,702	$407.82	$29,649,300
Administrative Services	18,365	$259.23	$4,760,800
Parking Structure	184,000	$78.37	$14,420,100
Sitework (14 acre site)	609,840	$31.97	$19,496,600
		Total Direct Costs	**$189,191,000**

In addition to the direct costs, there are other costs associated with constructing the facility. These costs include escalating costs to the start of construction, various fees such as architectural and engineering fees, materials testing, project, construction, and

contract management costs, and project contingency costs. Using the IBI information as a baseline, DGS estimated that the project cost to design and build the facility would be approximately $258.2 million. In addition, DGS estimates that there will be approximately $0.2 million for assessing the Pomona site and $5.693 million for the development of performance criteria. These estimates are provided in Attachment 1.

ARB estimates that there are approximately $101.8 million for fixed equipment. The equipment costs are due to the unique nature of this facility and include dynamometer pits and dynamometers, dilution air filtration and conditioning systems, humidifiers, clean rooms, SHEDs and Environmental Chambers, fume hoods, compressed gas cylinder cabinets, flammable storage cabinets, liquid nitrogen and gas distribution systems, laboratory benches and countertops, and a range of other laboratory and test equipment. Therefore, the total costs are projected to be approximately $365.9 million. DGS estimates that the project will take four and one-half years under the design-build approach.

Impact on Support Budget. ARB may incur increased utility and custodial costs once relocated to the larger facility. However, the new facility would be equipped with more energy-efficient systems that would help offset some of the utility costs. Additionally, as a new facility, there should not be significant special repairs or deferred maintenance costs in the near term. As many of the current buildings are leased from the private sector, a smooth transition into the new facility is foreseeable. The abandoned laboratory infrastructure at the vacated state-owned HSL facility can be surveyed out, sold, or reutilized. The real property can be sold or reutilized as appropriate.

b. Construct a new facility using the build-to-suit lease process.

Scope. This option consists of DGS soliciting private developers to compete against each other to acquire a site (or offer their own site), or use a state-identified site, design, and construct new Southern California facility utilize a long term lease of at least 20 years. The proposal demonstrating the best value to the state would be chosen and a long-term lease negotiated and executed. This would typically include an option to purchase the facility after the lease term.

Cost and Schedule. The direct project costs are the same as the estimate for the design-build approach. The attached DGS one-page estimate (Attachment 2) indicates the net present value of the rent stream would be approximately $332.3 million. With the fixed equipment costs, the total project costs would be approximately $434.1 million. DGS estimates that the project would take four and ½ years under the lease build-to-suit approach.

Impact on Support Budget. The impacts on the support budget would be similar to option a.

c. Construct a new facility through the capital outlay process utilizing the design-bid-build procurement process.

Scope. This option consists of contracting with an architect and engineer to design the facility and contracting with a builder to construct the facility. Per statute, the construction contract must be awarded to the lowest responsible bidder.

Cost and Schedule. DGS used the direct costs provided by IBI but adjusted them by five percent to account for design contingency factors. Using this information, DGS has estimated that the project cost under the design-bid-build approach would be approximately $298.3 million. These estimates are provided in Attachment 3. Including equipment brings the total project costs to approximately $400.1 million. DGS estimates that the project would take six years under the design-bid-build approach.

Impact on Support Budget. The impacts on the support budget would be similar to option a. However, the long timeframe for this option may result in there being substantial maintenance costs to update the existing Haagen-Smit Laboratory air conditioning and roof and additional sunk equipment costs to replace aging equipment at the existing facilities.

2. *Take No Action*

This alternative would involve taking no action and maintaining the existing Southern California facilities for the foreseeable future. However, the existing Southern California facilities cannot support ARB's future testing needs, do not provide adequate infrastructure to expand or upgrade equipment, are not energy efficient, and are not conducive to the work of a world-class laboratory. ARB will not be able to effectively meet its air quality and climate change responsibilities unless the emissions testing and research capabilities are upgraded in the very near future.

The Haagen-Smit Laboratory is an aged facility that requires extensive repairs, significant maintenance, and upgrades; some upgrades are not feasible due to HSL's age, layout, and/or infrastructure. The operations at this site have outgrown the existing original building initially intended to function with four dynamometers and house 40 staff. The current facility consists of several buildings scattered in proximity to the original HSL that hinders optimal work processes. The current configuration, in addition to being disconnected and inadequate in size, is also out of date and inadequate in its mechanical and electrical systems.

This facility cannot be modified or adapted to emerging technologies for new equipment. In particular, the laboratory is in disrepair and improperly designed to meet today's work and safety standards. If programs remain in these buildings, staff will be greatly limited in their ability to respond to the future programmatic needs of a vehicle emission research and testing laboratory, especially as new engine technologies and fuel sources are emerging. Even more critical will be the great risk posed to the public by the agency's inability to uphold responsibilities related to meeting air quality standards and climate change objectives.

3. *Demolish and Rebuild On the Existing Haagen-Smit Laboratory Site*

The state owns the Haagen-Smit Laboratory. Therefore, the state could save on land costs by demolishing and rebuilding on the existing site. However, there are several reasons why the current site is not a good location for the new facility. For example, there is no space to accommodate the needed heavy-duty testing and PEMS testing. The current site is not large enough to accommodate the long-term swing space that would be needed to rebuild. Even if the site footprint were adequate, most testing would go offline during the nearly three-year demolition and construction period. Due to the specialized nature of the testing, it is not feasible to secure sufficient off-site testing

capabilities to meet the program needs and it is impossible to establish adequate temporary operations.

4. *Construct a New Emissions Test Facility and Lease Office Space*

In this alternative, ARB would construct a new emissions testing and research facility that would just include test facilities and laboratories. ARB would then either continue to lease the existing space in El Monte, or lease space closer to the new emissions test facility. Currently, over 90 percent of the staff in Southern California either conduct operations directly associated with the emissions test facility or are major users of the emission test facility results. The vast majority of staff interacts directly with the emissions test facility staff, or are major users of the data. Therefore, this alternative is not productive and would not allow ARB to meet its federal air quality mandates and climate change requirements. Furthermore, the addition of staff offices to a new facility is relatively inexpensive compared to the cost of the test and laboratory facilities. In addition, leasing costs would continue to accumulate over time.

D. RECOMMENDED SOLUTION

1. *Which alternative and why?*

ARB recommends Alternative 1a (design-build option). In this Alternative, ARB would construct a new building through the capital outlay process using the design-build procurement method. This is the preferred alternative because it is the most cost effective and timely. This option also allows ARB to meets its program needs.

This alternative involves relocating and consolidating the state-owned Haagen-Smit Laboratory and adjacent leased buildings in El Monte, and remote MTA site to a new LEED-Platinum certified facility. A new facility on a new site will provide code compliant space, allow the location to support program requirements, improve the performance and efficiency of the operations currently and in the future, and provide an opportunity to attain LEED-Platinum certified status through a comprehensive design plan. The design plan will include, but not be limited to, reducing GHG, reducing water and energy use, providing a healthy and productive workplace, and providing electric vehicle (EV) charging stations. As such, the new facility will comply with all the accessibility requirements and hazardous material storage needs, and provide a secure area for operations.

2. *Detail scope description.*

The new Southern California facilities would total about 299,250 square feet, without parking. The site footprint would total about 14 acres. The building would be designed to meet LEED-Platinum certification standards. The project includes public parking for staff and visitors and secure parking for agency fleet vehicles and test vehicles. A multi-story parking structure is proposed. Additional site considerations include hazardous waste storage, fuel pumps and underground fuel storage tanks, and drum storage.

3. ***Basis for cost information.***

The costs for the new Southern California facility are based on the IBI Group analysis of the needed infrastructure and estimates provided by DGS on other costs. Attachment 4 is the Department of Finance's three-page fiscal impact worksheet for the recommended alternative.

4. ***Factors/benefits for recommended solution other than the least expensive alternative.***

With the recommended solution, ARB will be able to effectively meet its federal air quality mandates and climate change requirements by upgrading the emissions testing and research capabilities and eliminated problems associated with operating in obsolete and undersized facilities. The state-of-the-art and sustainable laboratory and office complex would meet our program needs through at least 2050. The new facility will continue the current research and testing functions and also be designed to accommodate new ones, including the needed capability to conduct research and test heavy-duty trucks and engines onsite in support of California's Sustainable Freight Initiative.

Every effort will be made to ensure that the new facility is designed to meet the needs of California in a cost-effective manner. Current plans for the new replacement facility include meeting LEED certified standards and incorporating a high energy-efficiency design. These attributes are consistent with new requirements for state buildings.

Perhaps most important, the new facility will adequately reflect the world-leading position of California. The new facility will also highlight the role of science and the full weight of commitment by the people of California to the mission of protecting public health and the stature of ARB as one of the leading agencies in the world for air pollution research and climate-related science and regulation.

5. ***Complete description of impact on support budget.***

ARB is assessing the ongoing personnel necessary to support the new testing facility. ARB has identified a need for new equipment to replace much of the existing equipment that will have reached the end of its useful life by the time of occupancy. Due to the general long life associated with the equipment, it has been included in the program budget. Upon approval, ARB will delay needed light-duty dynamometer replacements and maintain these through short-term repairs. Personnel and equipment will be requested in a support BCP in later fiscal years to coincide with building construction. ARB expects annual building costs to be approximately $24 million a year.

6. ***Identify and explain any project risks.***

The new Southern California facilities are unique. Therefore, there is a risk that there may be limited bids submitted that may result in higher than expected costs. There is also the risk of cost escalation due to a shortage in the materials and labor markets. Delays in the construction can also have extremely adverse effects on ARB's ability to meet its future needs, require expensive repairs in the existing Haagen-Smit Laboratory, and unnecessary replacement of aged equipment.

7. ***List requested interdepartmental coordination and/or special project approval (including mandatory reviews and approvals, e.g. technology proposals).***

   There is no specific interdepartmental coordination associated with this project. However, ARB works closely with the Bureau of Automotive Repair on the development of Smog Check test procedures and the California Highway Patrol on enforcement of ARB's regulations.

   In addition, ARB will work closely with the Department of Finance and the Department of General Serves on the financing and other real estate aspects of the project. Other state departments may be involved depending on the project design and development.

E. Consistency with Government Code Section 65041.1:

1. ***Does the recommended solution (project) promote infill development by rehabilitating existing infrastructure and how? Explain.***

   The site location of the facility has a direct impact on earning several LEED credits. Therefore, to achieve LEED Platinum status, ARB expects to earn several credits by locating on a sustainable site. Locating on previously developed land, considering repurposing existing structures, and brownfield sites can earn LEED points.

2. ***Does the project improve the protection of environmental and agricultural resources by protecting and preserving the state's most valuable natural resources? Explain.***

   Yes. ARB is proposing that the new facility be a LEED-Platinum certified project. This helps ensure the most efficient use of electricity, water, and other natural resources. ARB will also investigate the feasibility of achieving net zero energy for the project.

3. ***Does the project encourage efficient development patterns by ensuring that infrastructure associated with development, other than infill, support efficient use of land and is appropriately planned for growth? Explain***

   Yes. The project infrastructure will support efficient use of land and will be planned for ARB's expected growth at this location for at least the next 30 years.

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ATTACHMENTS

1. DGS Design-Build Project Cost Summary
2. DGS Lease Build-to-Suit Project Cost Summary
3. DGS Design-Bid-Build Project Cost Summary
4. DOF Fiscal Impact Worksheet for Recommended Alternative

DEPARTMENT OF GENERAL SERVICES
REAL ESTATE SERVICES DIVISION - PROJECT MANAGEMENT AND DEVELOPMENT BRANCH
PROJECT COST SUMMARY

PROJECT:	Southern California Consolidation Project	CONCEPT ESTIMATE:	C4ARB11BP
LOCATION:	Southern California	EST. / CURR'T. CCCI:	5977 / 5977
CUSTOMER:	State Air Resources Board	DATE ESTIMATED:	1/5/2015
DESIGN BY:	IBI Group	ABMS NO:	136676
PROJECT MGR:	S. Whitaker	PREPARED BY:	LL
TEMPLATE:	Design Build	DOF PROJ. I.D. NO.:	0

DESCRIPTION

Consolidation of the Southern California administrative offices, engine emission testing and laboratory from leased and state owned space into a new campus to accommodate 299,252 GSF and 400 parking spaces on a 14 acre site. Estimate is based on a conceptual hard costs provided by IBI Group dated 11/12/14 and adjusted downward for a smaller parking structure and site.

ESTIMATE SUMMARY

DIRECT COST	
Light Vehicle Testing (91,171 SF @ $487.05/SF)	$44,404,800
Heavy Duty Testing (62,316 SF @ $650.75/SF)	$40,552,100
PEMS Building (6,683 SF @ $382.17/SF)	$2,553,900
Chemistry Building (48,016 SF @ $694.63/SF)	$33,353,400
Office and Shared Building (72,702 SF @ $407.82/SF)	$29,649,300
ASD Building (18,365 SF @ $259.23/SF)	$4,760,800
Parking Structure (184,000 SF @ $78.37/SF)	$14,420,100
Sitework	$19,496,600

(Modified Template)

ESTIMATED TOTAL CURRENT COSTS:	**$189,191,000**
Adjust CCCI From 5977 to 5977 (DECEMBER 2014)	$0
Escalation to Start of Construction 34 Months @ 0.25% / Mo.:	$16,081,200
Escalation to Mid Point 18 Months @ 0.25% / Mo.:	$8,513,600
ESTIMATED TOTAL CONSTRUCTION COSTS:	**$213,785,800**
(INDIRECT COSTS)	
DSA Fees	$135,100
Architectural & Engineering Fees @ 6.5% ()	$13,896,000
Utility Connection Fees (Allowance)	$1,000,000
Commissioning (allowance)	$1,000,000
Materials Testing	$1,500,000
ESTIMATED TOTAL INDIRECT COSTS:	**$17,531,100**
ESTIMATED TOTAL Design Build CONTRACT:	**$231,316,900**

SUMMARY OF COSTS
BY PHASE

PROJECT:	Southern California Consolidation Project	CONCEPT ESTIMATE:	C4ARB11BP
LOCATION:	Southern California	DATE ESTIMATED:	1/5/2015
ABMS #:	136676		

CONSTRUCTION DURATION:	36 MONTHS	
ESTIMATED CONTRACT:	$231,316,900	$231,316,900
CONSTRUCTION CONTINGENCY:	$0	$0
TOTAL:	$231,316,900	$231,316,900

CATEGORY	ACQUISITION STUDY 00	BID DB / LP 01		WD/C DB / LP 03	TOTAL
ARCHITECTURAL AND ENGINEERING SERVICES					
A&E Design	$50,000	$1,900,000	$0	$1,800,000	$3,750,000
Construction Inspection				$2,800,000	$2,800,000
Construction Inspection Travel				$300,000	$300,000
Stipend for 3 DB Teams		$450,000			$450,000
Advertising, Printing and Mailing		$50,000	$0		$50,000
Construction Guarantee Inspection				$300,000	$300,000
SUBTOTAL A&E SERVICES	$50,000	$2,400,000	$0	$5,200,000	$7,650,000
OTHER PROJECT COSTS					
Special Consultants (Soils/Survey)	$50,000	$800,000	$0	$1,000,000	$1,850,000
Materials Testing				$600,000	$600,000
Project/Construction Management	$25,000	$1,100,000	$0	$4,200,000	$5,325,000
Contract Construction Management		$800,000	$0	$5,500,000	$6,300,000
Site Acquisition Cost & Fees	$25,000				$25,000
Agency Retained Items - MSF				$2,160,000	$2,160,000
SBE/DVBE Assessment				$641,100	$641,100
School Checking			$0		$0
Hospital Checking			$0		$0
Essential Services			$0		$0
Accessibility Checking			$0		$0
Environmental Document	$50,000	$500,000		$150,000	$700,000
Due Diligence		$75,000			$75,000
Other Costs - (SFM)		$18,000		$470,000	$488,000
State Project Contingency @ 3%				$6,940,000	$6,940,000
Other Costs - (ARF Assessment)	$0	$0	$0	$0	$0
SUBTOTAL OTHER PROJECT COSTS	$150,000	$3,293,000	$0	$21,661,100	$25,104,100
TOTAL ESTIMATED PROJECT COST	$200,000	$5,693,000	$0	$258,178,000	$264,071,000
LESS FUNDS TRANSFERRED	$0	$0	$0	$0	$0
LESS FUNDS AVAILABLE NOT TRANSFERRED	$0	$0	$0	$0	$0
CARRY OVER	$0	$200,000	$0	$5,893,000	
BALANCE OF FUNDS REQUIRED	$200,000	$5,893,000	$0	$264,071,000	$264,071,000

FUNDING DATA & ESTIMATE NOTES

PROJECT:	Southern California Consolidation Project	CONCEPT ESTIMATE:	C4ARB11BP
LOCATION:	Southern California	DATE ESTIMATED:	1/5/2015
ABMS #:	136676		

FUNDING DATA

Chapter / Item	Phase	Amount	Totals
Fund Transfers			
N/A	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
Total Funds Transferred			$0
Funds Available Not Transferred			
N/A	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
Total Funds Available not Transferred			$0
Total Funds Transferred and Available			$0

ESTIMATE NOTES

1. The construction costs in this estimate are indexed from the CCCI Index as of the date of estimate preparation to the CCCI index that is current as of DECEMBER 1, 2014. The project estimate is then escalated for a 18 month period to an assumed construction midpoint. Additionally, the project has been escalated to the assumed start of construction.

2. The Agency may have retained items that are not included in this estimate. RESD has not verified Agency retained pricing.

3. Special Consultant costs include Survey w/ Topo Map, Geotechnical, Soil Survey, Hydro Study, LEED and Commissioning.

4. The ARF Assessment of 1.233 percent is being phased out and is not included.

5. CEQA includes Phase I and Phase II assessments, CEQA document and monitoring of mitigation measures during construction.

6. Estimate does not include major equipment.

7. Project/Construction Management is for DGS Project Directors and Supervision. Contract Construction Management is for the hiring of an outside CM consulting firm.

8. 0

9. 0

10. 0

Project No.						
ARB LABORATORY SOUTHERN CALIFORNIA	Sq.Ft.	Unit cost per square foot		Dollars		Cost Per SF
BUILDINGS						
Light Vehicle Testing	91,171	$487.05		$ 44,404,835.55		
Heavy Duty Testing/OBD	62,316	$650.75		$ 40,552,137		
PEMS Building	6,683	$382.17		$ 2,554,042		
Chemistry Building/Including Air Mon	48,016	$694.63		$ 33,353,354		
Office & Shared Building	72,702	$407.82		$ 29,649,330		
ASD Building	18,365	$259.23		$ 4,760,759		
	299,253					
Parking Structure	184,000	$ 78.37		$ 14,420,080		
	483,253			**$ 169,694,537**		
Program items						
Sitework	609,840	$ 31.97		$ 19,496,585		
Hazardous Waste Storage	-	$ -		$ -		
Bicycle Lockers Area (12 lockers)	-	$ -		$ -		
Outdoor Fuel Pumps & Underground Tanks	-	$ -		$ -		
Field Drum Storage	-	$ -		$ -		
Liquid Nitrogen Tank	-			$ -		
				$ 189,191,122		
escalations to mid point of construction @ 3%				$ 11,351,467		
				$ 200,542,589		
Soft Costs						
Architectural & Engineering Fees		$ -		**$ 13,240,000**		
Materials Testing, Inspections, Commissioning				**$ 2,207,000**		
TOTAL BUILDING COST	483,253			**$ 215,989,589**		**$ 446.95**
LAND COST						
14	**609,840**			**$ 200,000**		$0.33
TOTAL LAND COST				**$ 200,000**		**$ 0.33**
TOTAL BUILDING AND LAND COST				**$ 216,189,589**		**$ 447.36**
Annual Rent = Total Cost x 8% R.O.I				**$ 17,295,167.16**		**$ 35.79**
Monthly Rent (Annual Rent / 12)				**$ 1,441,263.93**		**$ 2.98**
Monthly Operating Cost included in rent				**$ 217,463.85**		**$ 0.45**
Mo Rent (**W/O** Utilities)				**$ 1,658,727.78**		**$ 3.43**
Annual Rent (**W/O** Utilities)				**$ 19,904,733.36**		
Operating Costs **per SF Per Month**						
Janitorial	$ 0.20					
Utilities (to be baid by ARB)	$ -					
Taxes	$ -					
Insurance	$ 0.10					
R & M	$ 0.10					
Property Management	$ 0.05					
Operating Expenses per SF per Month	**$ 0.45**	x	483,253	**$ 217,463.85**		

Assumptions: Land costs = $200,000; Utilities will be paid directly by ARB at an estimated rate of $0.20/sf/month - or $0.20 x Building square footage

Tax Rate =0% X Total Project Cost / 12 / Building square footage = cost per square foot

				Annual Rent	Monthly Rent	
Annual Rent escalated annually by	101%		Yr 1	$ 19,904,733.36	$ 1,658,727.78	$ 3.43
			Yr 2	$ 20,103,780.69	$ 1,675,315.06	$ 3.47
			Yr 3	$ 20,304,818.50	$ 1,692,068.21	$ 3.50
			Yr 4	$ 20,507,866.68	$ 1,708,988.89	$ 3.54
			Yr 5	$ 20,712,945.35	$ 1,726,078.78	$ 3.57
			Yr 6	$ 20,920,074.80	$ 1,743,339.57	$ 3.61
			Yr 7	$ 21,129,275.55	$ 1,760,772.96	$ 3.64
			Yr 8	$ 21,340,568.31	$ 1,778,380.69	$ 3.68
			Yr 9	$ 21,553,973.99	$ 1,796,164.50	$ 3.72
			Yr 10	$ 21,769,513.73	$ 1,814,126.14	$ 3.75
			Yr 11	$ 21,987,208.87	$ 1,832,267.41	$ 3.79
			Yr 12	$ 22,207,080.95	$ 1,850,590.08	$ 3.83
			Yr 13	$ 22,429,151.76	$ 1,869,095.98	$ 3.87
			Yr 14	$ 22,653,443.28	$ 1,887,786.94	$ 3.91
			Yr 15	$ 22,879,977.71	$ 1,906,664.81	$ 3.95
Discount Rate	2.70%		Yr 16	$ 23,108,777.49	$ 1,925,731.46	$ 3.98
NPV of Rent Stream Only	$332,322,299.85		Yr 17	$ 23,339,865.27	$ 1,944,988.77	$ 4.02
NPV/sq.Ft	$687.68		Yr 18	$ 23,573,263.92	$ 1,964,438.66	$ 4.07
			Yr 19	$ 23,808,996.56	$ 1,984,083.05	$ 4.11
			Yr 20	$ 24,047,086.52	$ 2,003,923.88	$ 4.15
			Cumulative	$ 438,282,403.29	Effective Rent	$ 3.78

DEPARTMENT OF GENERAL SERVICES
REAL ESTATE SERVICES DIVISION - PROJECT MANAGEMENT AND DEVELOPMENT BRANCH
PROJECT COST SUMMARY

PROJECT:	Southern California Consolidation Project	CONCEPT ESTIMATE:	C4ARB11AP
LOCATION:	Southern California	EST. / CURR'T. CCCI:	5981 / 5981
CUSTOMER:	State Air Resources Board	DATE ESTIMATED:	1/5/2015
DESIGN BY:	IBI Group	ABMS NO:	136676
PROJECT MGR:	S. Whitaker	PREPARED BY:	LL
TEMPLATE:	Design / Bid / Build	DOF PROJ. I.D. NO.:	0

DESCRIPTION

Consolidation of the Southern California administrative offices, engine emission testing and laboratory from leased and state owned space into a new campus to accommodate 299,252 GSF and 400 parking spaces on a 14 acre site. Estimate is based on a conceptual hard costs provided by IBI Group dated 11/12/14 and adjusted downward for a smaller parking structure and site.

ESTIMATE SUMMARY

Light Vehicle Testing (91,171 SF @ $511.40/SF)	$46,625,000
Heavy Duty Testing (62,316 SF @ $683.29/SF)	$42,579,700
PEMS Building (6,683 SF @ $401.24/SF)	$2,681,500
Chemistry Building (48,016 SF @ $729.33/SF)	$35,021,000
Office and Shared Building (72,702 SF @ $428.21/SF)	$31,131,800
ASD Building (18,365 SF @ $272.19/SF)	$4,998,800
Parking Structure (184,000 SF @ $82.29/SF)	$15,141,100
Sitework	$20,471,400

ESTIMATED TOTAL CURRENT COSTS:	**$198,650,300**
Adjust CCCI From 5981 to 5981	$0
ESTIMATED TOTAL CURRENT COSTS ON NOVEMBER 2014	**$198,650,300**
Escalation to Start of Construction 63 Months @ 0.25% / Mo.:	$31,287,400
Escalation to Mid Point 18 Months @ 0.25% / Mo.:	$8,939,300
ESTIMATED TOTAL CONTRACTS:	**$238,877,000**
Contingency At: 5%	$11,943,900
ESTIMATED TOTAL CONSTRUCTION COST:	**$250,820,900**

SUMMARY OF COSTS
BY PHASE

PROJECT:	Southern California Consolidation Project	CONCEPT ESTIMATE:	C4ARB11AP
LOCATION:	Southern California	DATE ESTIMATED:	1/5/2015
ABMS #:	136676		

CONSTRUCTION DURATION:	36 MONTHS	
ESTIMATED CONTRACT:	$238,877,000	$238,877,000
CONSTRUCTION CONTINGENCY:	$11,943,900	$11,943,900
TOTAL:	$250,820,900	$250,820,900

CATEGORY	ACQUISITION STUDY 00	PRELIMINARY PLANS 01	WORKING DRAWINGS 02	CONSTRUCTION 03	TOTAL
ARCHITECTURAL AND ENGINEERING SERVICES					
A&E Design	$50,000	$6,808,000	$7,525,100	$3,583,500	$17,966,600
Construction Inspection				$5,000,000	$5,000,000
Construction Inspection Travel				$800,000	$800,000
Project Scheduling & Cost Analysis					$0
Advertising, Printing and Mailing		$0	$50,000		$50,000
Construction Guarantee Inspection				$300,000	$300,000
SUBTOTAL A&E SERVICES	$50,000	$6,808,000	$7,575,100	$9,683,500	$24,116,600
OTHER PROJECT COSTS					
Special Consultants (Soils/Survey)	$50,000	$1,500,000	$1,000,000	$1,194,400	$3,744,400
Materials Testing				$1,194,400	$1,194,400
Project/Construction Management	$25,000	$800,000	$1,100,000	$4,800,000	$6,725,000
Contract Construction Management			$800,000	$6,500,000	$7,300,000
Site Acquisition Cost & Fees	$25,000				$25,000
Agency Retained Items - MSF				$2,160,000	$2,160,000
SBE/DVBE Assessment				$738,800	$738,800
School Checking			$0		$0
Hospital Checking			$0		$0
Essential Services			$0		$0
Accessibility Checking			$134,800		$134,800
Environmental Document	$50,000	$500,000		$150,000	$700,000
Due Diligence		$75,000			$75,000
Other Costs - (SFM)		$17,000	$38,100	$470,000	$525,100
Other Costs - (Permit/Reg. Fees)					$0
Other Costs - (ARF Assessment)	$0	$0	$0	$0	$0
SUBTOTAL OTHER PROJECT COSTS	$150,000	$2,892,000	$3,072,900	$17,207,600	$23,322,500
TOTAL ESTIMATED PROJECT COST	$200,000	$9,700,000	$10,648,000	$277,712,000	$298,260,000
LESS FUNDS TRANSFERRED	$0	$0	$0	$0	$0
LESS FUNDS AVAILABLE NOT TRANSFERRED	$0	$0	$0	$0	$0
CARRY OVER	$0	$200,000	$9,900,000	$20,548,000	
BALANCE OF FUNDS REQUIRED	$200,000	$9,900,000	$20,548,000	$298,260,000	$298,260,000

FUNDING DATA & ESTIMATE NOTES

PROJECT:	Southern California Consolidation Project	CONCEPT ESTIMATE:	C4ARB11AP
LOCATION:	Southern California	DATE ESTIMATED:	1/5/2015
ABMS #:	136676		

FUNDING DATA

Chapter / Item	Phase	Amount	Totals
Fund Transfers			
N/A	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
Total Funds Transferred			$0
Funds Available Not Transferred			
N/A	0	$0	
0	0	$0	
0	0	$0	
0	0	$0	
Total Funds Available not Transferred			$0
Total Funds Transferred and Available			$0

ESTIMATE NOTES

1. The construction costs in this estimate are indexed from the CCCI Index as of the date of estimate preparation to the CCCI index that is current as of NOVEMBER 1, 2014. The project estimate is then escalated for a 18 month period to an assumed construction midpoint. Additionally, the project has been escalated to the assumed start of construction.

2. The Agency may have retained items that are not included in this estimate. RESD has not verified Agency retained pricing.

3. Special Consultant costs include Survey w/ Topo Map, Geotechnical, Soil Survey, Hydro Study, LEED, Commissioning and Utility Design Fees.

4. The ARF Assessment of 1.233 percent is being phased out and is not included.

5. CEQA includes Phase I and Phase II assessments, CEQA document and monitoring of mitigation measures during construction.

6. Project/Construction Management is for DGS Project Directors and Supervision. Contract Construction Management is for the hiring o an outside CM consulting firm.

7. Estimate does not include major equipment.

8. 0

9. 0

10. 0

FUNDING DATA & ESTIMATE NOTES

PROJECT:	Southern California Consolidation Project	CONCEPT ESTIMATE:	C4ARB11AP
LOCATION:	Southern California	DATE ESTIMATED:	1/5/2015
ABMS #:	136676		

FUNDING DATA

	Chapter / Item	Phase	Amount	Totals
Fund Transfers				
N/A		0	$0	
	0	0	$0	
	0	0	$0	
	0	0	$0	
	0	0	$0	
	0	0	$0	
	0	0	$0	
	0	0	$0	
Total Funds Transferred				$0
Funds Available Not Transferred				
N/A		0	$0	
	0	0	$0	
	0	0	$0	
	0	0	$0	
Total Funds Available not Transferred				$0
Total Funds Transferred and Available				$0

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10. 0

STATE OF CALIFORNIA									Budget Year 2015-16
CAPITAL OUTLAY BUDGET CHANGE PROPOSAL (COBCP)								Proj ID:	000000000000691
FISCAL IMPACT WORKSHEET								BU/Entity:	3900
Department Title:	Air Resources Board							Program ID	3520
Project Title:	ARB Southern California Consolidation Project							COBCP #:	1
Program Category:	Critical Infrastructure Deficiencies							Priority:	1
Program Subcategory:	Laboratory							MA/MI:	MA

			Existing Authority	January 10 Action	April 1 Action	May 1 Action	Special Action	Net Legis Changes	Project Total
FUNDING									
bu-ref-fund-eny-year	ph	action							
3900-301-0044-2015-2015	A	BA		130					130
3900-301-0115-2015-2015	A	BA		40					40
3900-301-0421-2015-2015	A	BA		30					30
3900-301-0044-2015-2015	D	BA		3,700					3,700
3900-301-0115-2015-2015	D	BA		1,139					1,139
3900-301-0421-2015-2015	D	BA		854					854
3900-301-0668-2017-2017	B	FF							0
									0
									0
									0
									0
									0
									0
									0
TOTAL FUNDING			0	5,893	0	0	0	0	5,893
PROJECT COSTS									0
Study									0
Acquisition				200					200
Performance Criteria				5,693					5,693
Working Drawings									0
Total Construction			0	258,178	0	0	0	0	258,178
Equipment				101,822					101,822
TOTAL COSTS			0	365,893	0	0	0	0	365,893
CONSTRUCTION DETAIL									0
Contract				231,317					231,317
Contingency									0
A&E				5,200					5,200
Agency Retained									0
Other				21,661					21,661
TOTAL CONSTRUCTION			0	258,178	0	0	0	0	258,178
FUTURE FUNDING			0	360,000	0	0	0	0	360,000

SCHEDULE	mm/dd/yyyy
Study Completion	1/1/2015
Acquisition Approval	7/1/2015
Start Performance Criteria	7/1/2015
Performance Criteria Approval	1/1/2016
Approval to Proceed to Bid	6/1/2016
Contract Award Approval	7/1/2017
Project Completion	1/1/2020

PROJECT SPECIFIC CODES

Proj Mgmt:	ARB	Location:	
Budg Pack:	N/A	County:	
Proj Cat:	CRI	City:	
Req Legis:	N	Cong Dist:	
Req Prov:	N	Sen Dist:	
SO/LA Imp:		Assm Dist:	

STATE OF CALIFORNIA		**Budget Year 2015-16**	
CAPITAL OUTLAY BUDGET CHANGE PROPOSAL (COBCP)		Proj ID:	000000000000691
FISCAL DETAIL WORKSHEET		BU/Entity:	3900
Department Title:	Air Resources Board	Program ID	3520
Project Title:	ARB Southern California Consolidation Project	COBCP #:	1
Program Category:	Critical Infrastructure Deficiencies	Priority:	1
Program Subcategory:	Laboratory	MA/MI:	MA

Identify all items which fit into the categories listed below. Attach a detailed list if funding is included in this request. Provide descriptions and summary estimates for items for which you plan to request funding in the future. When possible, identify funding needs by fiscal year (BY+1 through BY+4).

PROJECT RELATED COSTS	COST	TOTAL
AGENCY RETAINED:		
TOTAL AGENCY RETAINED		0
GROUP 2 EQUIPMENT		
TOTAL GROUP2 EQUIPMENT		0

IMPACT ON SUPPORT BUDGET	COST	TOTAL
ONE-TIME COSTS		
TOTAL SUPPORT ONE-TIME COSTS		0
ANNUAL ONGOING FUTURE COSTS		
TOTAL SUPPORT ANNUAL COSTS		0
ANNUAL ONGOING FUTURE SAVINGS		
TOTAL SUPPORT ANNUAL SAVINGS		0
ANNUAL ONGOING FUTURE REVENUE		
TOTAL SUPPORT ANNUAL REVENUE		0

STATE OF CALIFORNIA			**Budget Year 2015-16**
CAPITAL OUTLAY BUDGET CHANGE PROPOSAL (COBCP)		Proj ID:	000000000000691
SCOPE/ASSUMPTIONS WORKSHEET		BU/Entity:	3900
Department Title:	Air Resources Board	Program ID	3520
Project Title:	ARB Southern California Consolidation Project	COBCP #:	1
Program Category:	Critical Infrastructure Deficiencies	Priority:	1
Program Subcategory:	Laboratory	MA/MI:	MA

Project Specific Proposals: *For new projects provide proposed Scope language. For continuing projects provide the latest approved Scope language. Enter Scope language in cell A110.*

Conceptual Proposals: *Provide a brief discussion of proposal defining assumptions supporting the level of funding proposed by fiscal year in relation to outstanding need identified for that fiscal year. (Also include scope descriptions for BY+1 through BY+4 in cell A110).*

This proposal will consolidate Southern California vehicle testing and research facilities. It will be constructed on a piece of State-owned land in Pomona, CA.