Report to the Legislature

Five-Year Plan for the Waste Tire Recycling Management Program

Tenth Edition: Covering Fiscal Years 2019-20 to 2023-24

February 5, 2021

CalRecycle

California Department of Resources Recycling and Recovery

State of California
Gavin Newsom
Governor

California Environmental Protection Agency
Jared Blumenfeld
Secretary

Department of Resources Recycling and Recovery (CalRecycle)
Rachel Machi Wagoner
CalRecycle Director

Public Affairs Office
1001 I Street (MS 22-B)
P.O. Box 4025
Sacramento, CA 95812-4025
www2.calrecycle.ca.gov/Publications/
1-800-RECYCLE (California only) or (916) 341-6300

Publication # 2019-1653

To conserve resources and reduce waste, CalRecycle reports are produced in electronic format only. If printing copies of this document, please consider use of recycled paper containing 100 percent postconsumer fiber and, where possible, please print on both sides.

This report was prepared by staff of the Department of Resources Recycling and Recovery (CalRecycle) to provide information or technical assistance. The statements and conclusions of this report are those of CalRecycle staff and not necessarily those of the department or the state of California. The state makes no warranty, expressed or implied, and assumes no liability for the information contained in the succeeding text. Any mention of commercial products or processes shall not be construed as an endorsement of such products or processes.

The California Department of Resources Recycling and Recovery (CalRecycle) does not discriminate on the basis of disability in access to its programs. CalRecycle publications are available in accessible formats upon request by calling the Public Affairs Office at (916) 341-6300. Persons with hearing impairments can reach CalRecycle through the California Relay Service at 1-800-735-2929.

Table of Contents

Acknowledgments

This report was prepared by CalRecycle staff from Materials Management and Local Assistance Division; Waste Permitting, Compliance and Mitigation Division; Administration, Finance & Information Technology Services Division; Office of Public Affairs; and Legal Affairs Office. Staff would like to thank the tire recycling industry, environmental groups, local and state agencies, the regulated community, other CalRecycle programs, Boisson Consulting, and interested parties that participated in the development of this plan.

While this plan covers Fiscal Years 2019-20 through 2023-24, this report and the statements and projections therein were developed before the economic disruptions related to the COVID-19 pandemic. CalRecycle is cognizant that there may be impacts to the Waste Tire Recycling Management Program in 2020-21 and beyond. CalRecycle will continue to work with stakeholders to understand the impacts.

Introduction

Senate Bill 876 (Escutia, Statutes of 2000, Chapter 838) was enacted to provide a comprehensive measure to extend and expand California's regulatory program related to the management of waste and used tires. One of the key provisions of this measure requires the Department of Resources Recycling and Recovery (CalRecycle) to adopt and submit to the legislature a Five-Year Plan that includes proposed budget allocations. In addition, it requires that the Plan be updated every two years.

SB 876 requires CalRecycle to include in the Five-Year Plan the hierarchy used by the department to maximize productive uses of waste and used tires. CalRecycle uses the hierarchy in the following order of priority:

- Source Reduction;
- Recycling;
- Transformation (energy recovery, tire derived fuel); and
- Disposal.

The hierarchy is to be used as guidance, but not a rigid formula, in establishing priorities for the Waste Tire Recycling Management Program.

CalRecycle's goal, although not codified in statute, is that 75 percent of waste tires be recycled. Affiliated goals include the following:

- Developing long-term, sustainable, and diversified market demand for California tire-derived products
- Ensuring the protection of public health, safety, and the environment while developing a safe and high-quality supply infrastructure to meet that demand ,;
- Fostering information flow, technology, and product development so environmental protection and diversion goals are achieved with supply and demand in balance

CalRecycle has designed the enforcement elements of the Waste Tire Recycling Management Program not only to protect public health, safety, and the environment but also to provide for a fair and consistent marketplace for recycled tires. CalRecycle has moved aggressively to expand tire enforcement efforts and revise current regulations.

Our enforcement staff provides technical assistance and training to the regulated community that includes tire haulers, tire generators, and permitted tire facilities. However, if a business demonstrates an unwillingness to comply and is not responsive to technical assistance and training, then CalRecycle initiates enforcement action. Tire facility permitting staff, coupled with expanded and robust statewide enforcement efforts, is working to ensure a level playing field for tire facilities, haulers, and generators who operate within the law.

With respect to diversion and market development, after reaching an all-time high of 92.9 percent diversion from landfills in 2012 (and exceeding CalRecycle's previous 90 percent diversion goal), the overall waste tire diversion rate decreased to 76.1 percent in 2017. The recycling rate, which excludes alternative daily cover (ADC) and tire-derived fuel (TDF) (including TDF consumed in the state as well as exported size-reduced TDF and waste tire bales assumed to be likely used as fuel) remains stagnant, around 33.3 percent. After hitting an all-time low of 7.3 percent in 2012, tire disposal increased for the next four consecutive years reaching 32.2 percent in 2016, before decreasing to 23.9 percent in 2017.* Waste tire exports are also dynamic. The increase in exports in 2012 was mainly a result of the continued, unprecedented rapid growth in the export of waste tires to Pacific Rim nations, largely for use as TDF, which is currently the largest end-use destination for California waste tires.

CalRecycle's current market development programs continue to focus on increasing the processing of California waste tires into California-produced tire-derived products. To move closer to this goal, CalRecycle implemented a small tire incentive program. This program provides economic incentives to participating manufacturers to increase sales to businesses. While many stakeholders would prefer a free-market system with no subsidies, CalRecycle's perspective is that subsidies will continue to be needed to establish markets for products that incorporate waste tires into end uses such as paving, molded products, retaining walls, etc. As a corollary, CalRecycle continues to believe that a variety of markets that use California-produced products is preferable, rather than focusing on only one primary market, even if the cost per tire varies among these end uses. This approach is consistent with CalRecycle's AB 341 (Chesbro, Chapter 476, Statutes of 2011) policy goal that 75 percent of the solid waste generated in the state be source reduced, recycled, or composted by 2020.

* California Waste Tire Market Report: 2017

Vision for the Future

For years, CalRecycle has relied on a variety of grant programs, along with focused research, technical support, and outreach, as the bulwark of its market development efforts. While these efforts have been successful in expanding markets and helping businesses to increase production and develop new products, the facts speak to the need to reassess this fundamental market development approach. In particular, the tire recycling rate—i.e., for activities that result in use of waste tires to produce marketable products (as opposed to exports or use as alternative daily cover or ADC)—has hovered for years below 40 percent. It is only because of exports and ADC end use, along with use of TDF for energy recovery, that the total diversion rate has reached into the 90 percent range. However, CalRecycle is focused on increasing in-state markets in lieu of tires being exported for use as TDF.

In previous Five Year Plans, CalRecycle articulated a new vision for an expanded incentive program that would provide payments for desired end uses of tires. This would entail differential incentive payment rates, with higher payments for preferred end uses such as incorporation of crumb rubber into rubberized asphalt concrete and molded products and with moderate payments for end uses such as use of tire-derived aggregate in retaining walls. The incentive program may be modeled after similar incentive programs, such as the Beverage Container Recycling Program's plastic market development payments. In order to be effective and reach as high a recycling rate as possible, CalRecycle estimated that such a program would require significant new funding, along with legislation authorizing CalRecycle to implement this type of incentive approach.

However, legislation authorizing this type of approach has not been enacted and the Tire Recycling Fund itself has a declining balance that cannot support the provision of additional funding. Given this, CalRecycle is instead proposing to implement an expanded version of the current Tire Incentive Program, using market development-related funding that is already allocated (i.e., existing funding). This approach would use grant agreements that provide a specified amount of funding to individual companies, with payments made on the basis of agreed-upon performance measures. This is not a pure incentive payment approach, but it is allowable under current statute. As part of this, CalRecycle would consider consolidating some or all of its tire market development grant programs (Rubberized Pavement, Tire-Derived Product, Tire Incentive Program, and Tire-Derived Aggregate) into a new Tire Recycling Incentive Program and would only use funding that is already authorized and allocated for these programs.

Many details would have to be vetted before implementing this, including the timing of such a shift, various program development and documentation issues, determining the appropriate incentive amounts, ensuring that the incentive results in the desired reduced cost of products (rubberized pavement, manufactured products, etc.), having funding in the appropriate budget categories, and other issues.

As part of this approach CalRecycle also would continue to support research and maintain the required emergency reserve. It would also continue the current level of support for inspection and enforcement activities, the hauler manifest system, market trend analysis and targeted outreach, and consolidated technical support for rubberized asphalt concrete and tire-derived aggregate projects. Implementation of an expanded tire incentive program may necessitate changes to the long-term expenditure estimates in Table 1.

Used and Waste Tires Along the Border of Mexico

Used tires continue to flow into Mexico through border entries, and a portion end up as waste tires that are illegally disposed along the California-Mexico border. Waste tires that end up along the border are either dumped illegally at various sites or used for structural purposes in or near Tijuana, Baja California, Mexico. Illegally dumped waste tires can cause environmental problems in the California-Mexico border region, including in the Tijuana River estuary. Sources of waste tires include new tires sold in Baja California, and used tires imported as commodities into Baja California from California, Arizona, and other states which are discarded after use.

Collaboration with multiple stakeholders in order to understand the flow of used and waste tires in the border region is critical to the identification and prioritization of border projects that may be effective in alleviating long-term environmental problems associated with waste tires. Accordingly, CalRecycle contracted with San Diego State University Research Foundation to research the flow of tires in the border region and identify potential projects to protect the environment. Several workshops were conducted under the contract to discuss these issues. In April 2017, a workshop was held in Sacramento to discuss the challenges of waste tire disposal in Mexico. In August 2017, a workshop was held in San Diego to discuss solutions for waste tire disposal in Mexico. In November 2017, a third workshop was held in Tijuana, Baja California where representatives from Mexico, California Environmental Protection Agency, and CalRecycle discussed waste tire regulations, compliance with the program, and the

possible usage of rubberized asphalt concrete and tire derived aggregate to reduce illegal disposal by creating markets for waste tires.

As Mexican federal and Baja California state governments continue to work on the establishment of an overall statutory framework for tire management, CalRecycle will continue to provide technical assistance and facilitate knowledge transfer to the governments as they work to institutionalize and finance a waste tire recycling program. More information on CalRecycle's efforts in the border area can be found in this plan, including links to three comprehensive waste tire border studies.

Program Elements

The Five-Year Plan is divided into the program elements identified in Public Resources Code section 42885.5(b):

- Enforcement and regulations relating to the storage of waste and used tires
- Waste and used tire hauler program and manifest system
- Cleanup, abatement, or other remedial actions related to tire stockpiles throughout the state
- Research directed at promoting and developing alternatives to the landfill disposal of tires
- Market development and new technology activities for waste and used tires

Each of the program elements consists of four sections:

1. *Program Background and Status.* This section includes background information, a summary of achievements, and an overview of planned activities.
2. *Objectives.* This section lists the objectives the program element is designed to achieve.
3. *Performance Measures.* This section identifies how individuals or groups of related element activities can be measured to show how well objectives and goals are met.
4. *Activity Description and Budget.* This section includes an overall chart of element activities and describes each activity with associated budget information by fiscal year.

Budget and Summary

The Tenth Edition of the Five-Year Plan presents the following budget for CalRecycle's Tire Program for FYs 2019–20 through 2023–24. The proposed expenditures reflect the spending authority limit for the Tire Program as outlined in the governor's budget. Existing law reduces the Tire Fee from $1.75 to $.75 per tire on January 1, 2024. Absent an extension of the Tire Fee at $1.75, which is proposed as part of the Governor's 2021 Budget, spending projections for fiscal year 2023-24 will be lower than reflected in this document.

Table 1: Total Tire Program Funding for Fiscal Years 2019–20 through 2023–24

Program Areas	FY 2019–20	FY 2020–21	FY 2021–22	FY 2022–23	FY 2023–24	Totals for All Fiscal Years
Enforcement	$7,100,000	$7,100,000	$7,100,000	$7,100,000	$7,100,000	**$35,500,000**
Hauler Program and Manifest System	$450,000	$450,000	$450,000	$450,000	$450,000	**$2,250,000**
Cleanup	$7,661,000	$7,500,000	$7,500,000	$7,500,000	$7,500,000	**$37,661,000**
Research and Market Development	$12,227,000	$12,387,000	$12,387,000	$12,387,000	$12,387,000	**$61,775,000**
Program Staffing and Administration	$7,843,000	$7,843,000	$7,843,000	$7,843,000	$7,843,000	**$39,215,000**
Administration	$3,779,000	$3,779,000	$3,779,000	$3,779,000	$3,779,000	**$18,895,000**
Mandatory Contracts	$1,392,000	$1,392,000	$1,392,000	$1,392,000	$1,392,000	**$6,960,000**
Totals	**$40,452,000**	**$40,451,000**	**$40,451,000**	**$40,451,000**	**$40,451,000**	**$202,256,000**
Tire Program's Spending Authority	**$40,052,000**	**$40,051,000**	**$40,051,000**	**$40,051,000**	**$40,051,000**	**$200,256,000**
Farm and Ranch Solid Waste Cleanup and Abatement Grant Program's Spending Authority	**$400,000**	**$400,000**	**$400,000**	**$400,000**	**$400,000**	**$2,000,000**

Enforcement and Regulations Related to the Storage of Waste and Used Tires

Enforcement Program Background and Status

The Waste Tire Enforcement Program's primary goal is to manage and mitigate the impacts of tires on public health and safety and the environment by ensuring that tire businesses comply with tire permitting, storage, and movement laws; regulations; and state minimum standards. CalRecycle monitors compliance through integrated and consistent permitting, inspection, and enforcement efforts. CalRecycle works closely with state and local governments to:

- Inspect tire businesses for compliance with permitting, storage, and movement laws; regulations; and state minimum standards;
- Educate tire businesses and property owners about tire laws and regulations;
- Survey for illegal dumping, storage, and movement of tires; and
- Take enforcement actions as needed to correct violations.

CalRecycle's Waste Tire Enforcement Program originated in 1989 with the passage of the California Tire Recycling Act to address the need for better waste tire management in California. While the act established grants and loans to businesses and public entities to develop recycling markets for waste tires, the act also initiated the development of waste tire facility regulations for safe storage of waste tires, and established a related permitting system. The act established the first waste tire fee and the California Tire Recycling Management Fund. As the program advanced over the years, additional laws were passed to further protect public health and safety and the environment by improving program effectiveness for all stakeholders to better comply with the law. More detail about the legislative history of the program is contained in the *Five-Year Tire Plan for the Waste Tire Recycling Management Program Report to the Legislature* dated September 2001.

CalRecycle's Waste Tire Enforcement Program worked closely with other cleanup-related components in the Five-Year Plan. For example, enforcement actions against the largest known waste tire sites in the state resulted in negotiated settlements and CalRecycle's Cleanup Branch administering cleanups. The enforcement program and the cleanup program continue to be closely aligned and administered. The Five-Year Plan's long-term cleanup and remediation costs have been shifted from large cleanup

activities to enforcement programs that have shown a continued positive impact to waste tire issues statewide.

Rigorous waste tire enforcement, pursuant to CalRecycle's policy goals, minimizes the likelihood that large waste tire sites will develop, go unaddressed, and potentially cause environmental crises like the Westley and Tracy tire fires that occurred in the late 1990s. CalRecycle's continued focus is on maintenance and prevention of illegal tire piles through permitting, inspection, and the waste tire hauler registration and manifest programs. Additionally, ongoing ground and aerial surveillance assist enforcement efforts by identifying remote illegal tire sites and illegal activities of tire businesses. These programs, especially focusing on inspection and surveillance, generate enforcement cases on an ongoing basis.

CalRecycle's Waste Tire Enforcement Program follows CalEPA's enforcement initiatives, which include a progressive enforcement method. CalRecycle first strives to provide education and outreach about waste tire requirements during regular inspections, and then issues a standard Notice of Violation if a violation is observed as a first time offense. If a violation is not corrected, or is a repeat of past violations, the following enforcement actions are taken until the violation has been resolved:

- Cleanup and abatement orders,
- Administrative complaints to levy penalty payments, and
- Referrals to local district attorneys or to the California attorney general.

Civil and criminal actions are reserved for egregious violations and repeat offenders.

Part of the Waste Tire Enforcement Program's critical strength and effectiveness is due to its radiated impact through the use of the local Tire Enforcement Agent (TEA) Program. The Waste Tire Enforcement Program coordinates with CalRecycle's Financial Resources Management (FiRM) Branch to implement the Local Government TEA Grant Program that supports the activities of local jurisdictions in carrying out CalRecycle's waste tire enforcement efforts. TEAs also provides support for CalRecycle's illegal dumping initiatives since waste tires are often illegally dumped along with other solid waste. Therefore, waste tire program field personnel and the surveillance support available through the TEA Grant Program can be leveraged in many instances to address both waste tire and other illegal dumping objectives. The TEA Grant Program will prioritize San Diego and Imperial Counties.

When illegal dumping does occur, the Waste Tire Enforcement Program and the Cleanup Program collaborate with the FiRM Branch on the administration of grant programs for Farm and Ranch Solid Waste Cleanup and Abatement, Local Government Waste Tire Amnesty, Local Government Waste Tire Cleanup, and Local Conservation Corps. For example, when enforcement staff discover waste tire piles on privately owned agricultural property, and the tire piles are determined not to be the responsibility of the landowner, the Waste Tire Enforcement Program brings them to the attention of the FiRM Branch staff for potential grant funding consideration. Conversely, Farm and Ranch Grant applications that do not have the required landowner certifications of non-responsibility are deemed ineligible and referred to the Waste Tire Enforcement Program for appropriate follow up. Taking immediate action to assist with clean-up of illegally dumped piles prevents sites from becoming what are known as nuisance sites, which can attract further dumping if not cleaned up quickly. Swift outreach, surveillance, enforcement, and cleanup activities continue to be a critical prevention measure in minimizing large waste tire piles and protecting the environment. San Diego and Imperial County will be a priority region for collecting piles of waste tires.

Objectives

The enforcement program has the following objectives:

1. Support existing and new waste tire enforcement grantees by providing stable funding, training, and ongoing technical assistance.
2. Inspect tire businesses on a routine basis to ensure compliance with all state tire permitting, storage, and movement laws; regulations; and state minimum standards.
3. Provide ongoing surveillance for illegal tire sites. Identify and investigate all suspected illegal tire sites through ground and aerial surveillance and respond to complaints.
4. Bring all known sites that are operating illegally (without the proper permits and/or operating outside the terms and conditions of their permits or state minimum standards) into compliance through a progressive enforcement program.
5. Manage a tire database that will collect, store, and report the necessary information for an effective program.

Prioritize cleanups in San Diego andImperial County and report the number of tires collected.

Performance Measures

The performance measures listed below have been streamlined and updated to align with the activities listed in this biennial revision of the Five-Year Plan.

1. **Inspections**
   - Inspect all active major and minor permitted facilities in California at least once every 12 months.
   - Inspect all active registered and exempt haulers located in California at least once every 24 months.
   - Inspect all active generators and end-use facilities located in California at least once every 36 months.

2. **Noncompliant Tire Businesses**
   - Take timely progressive enforcement actions on illegal, unpermitted waste tire facilities, and hauling violations.
   - Report the number of illegal sites remediated through the enforcement program.
   - Track the number of penalties levied for violations pertaining to waste and used tires.

3. **Grant Program**
   - Provide training to TEA grantee inspectors.
   - Report on TEA grantee performance.

Activity Description and Budget

The Waste Tire Enforcement Program implements a two-pronged approach to statewide enforcement using local enforcement entities where available and state resources in other areas. The program provides ongoing assistance to local jurisdictions and oversees the entire enforcement effort. Table 2 provides a list of activities and associated budgets for the “Enforcement and regulations relating to the storage of waste and used tires” element.

Table 2: Budget for Enforcement and Regulations Relating to the Storage of Waste and Used Tires

Program Area	FY 2019–20	FY 2020–21	FY 2021–22	FY 2022–23	FY 2023–24
Waste Tire Enforcement Support Activities	$200,000	$200,000	$200,000	$200,000	$200,000
California Highway Patrol Agreement to Support Enforcement Activities	$100,000	$100,000	$100,000	$100,000	$100,000
Local Government Waste Tire Enforcement Grant Program	$6,500,000	$6,500,000	$6,500,000	$6,500,000	$6,500,000
Database System Maintenance and Enhancement	$200,000	$200,000	$200,000	$200,000	$200,000
Tire Enforcement Inspector Technical Training	$100,000	$100,000	$100,000	$100,000	$100,000
Totals	**$7,100,000**	**$7,100,000**	**$7,100,000**	**$7,100,000**	**$7,100,000**

1. **Waste Tire Enforcement Support Activities**
   This line item supports the overall mission of enforcing the laws regarding the hauling, storage, and disposal of waste and used tires in California and along the California-Mexico border region and illegal activities related to export of tires through California ports. Funds will be allocated to the following projects:

   - **Surveillance Equipment and Assistance**
     CalRecycle entered into an agreement with the California Air Resources Board (CARB) in May 2014, which continues CARB's previous support of field investigations by CalRecycle tire enforcement staff and local waste tire enforcement grantees. CARB has extensive experience in assisting other agencies in the purchase, maintenance, monitoring, and use of both covert and overt surveillance equipment. CARB's expertise has aided and should continue

to aid CalRecycle and local waste tire enforcement grantees' efforts to detect, deter, and prosecute those who illegally haul and dispose of tires or engage in illegal activities related to tire exports through California ports. Additionally, as needed, CARB will help CalRecycle identify, evaluate, and procure more sophisticated surveillance equipment for covert activities to allow for real-time remote monitoring and sensing.

- **Investigation Database Subscriptions**
  CalRecycle purchases access to advanced government investigation databases for the purposes of properly locating and serving responsible parties with notices when environmental violations have been observed and need to be brought into compliance or further enforced upon.

- **Waste Tire Conversion Calculation Re-evaluation**
  CalRecycle will procure contractor support, and/or execute an interagency agreement, to evaluate any changes in the average industry standard tire size and weight and to develop and implement any revised passenger tire equivalent conversion factors and volumetric estimation calculation methods that are used by inspectors in the field to estimate the number of waste tires in tire piles.

- **Evaluation of Enhanced Manifest Tracking Opportunities**
  CalRecycle will examine the current status of technologies available to offer enhanced opportunities to track, monitor, and regulate the usage of manifests to manage the movement of used and waste tires that can be deployed statewide and made equitably accessible to all stakeholders.

- **Waste Tire Enforcement Training, Development, and Outreach**
  CalRecycle will continue to provide training and conduct regular meetings, workshops, and webinars to train and maintain a high level of competence among all local government waste tire inspectors working in the TEA grant program in support of ongoing compliance verification, violation detection, and enforcement case development. CalRecycle will also provide ongoing training for waste tire haulers, CHP officers, local sheriff's deputies, police officers, and other state law enforcement personnel to make them aware of California's waste tire laws and regulations and the role they can play in helping detect violations and provide additional enforcement support, particularly inSan Diego and Imperial Counties.

This effort will focus on providing ongoing education and training to waste tire haulers as part of their annual registration renewal activities. The overall effort is focused on using the Internet to communicate with our partners and stakeholders in the regulated community and providing needed education and training. The latter is part of CalRecycle's efforts to achieve greater waste tire enforcement compliance through expanded education and outreach. This will enable CalRecycle to focus limited enforcement resources on more serious and repeat offenders.

Activity Funding
FYs 2019–20 through 2023–24 ……$200,000 per fiscal year

2. **California Highway Patrol (CHP) Agreement to Support Enforcement Activities**
   CHP will continue its support to CalRecycle's field efforts in the areas of ground and aerial surveillance, covert and overt investigations, inspector security, training for state and local law enforcement officers, and roadside checkpoints to assist CalRecycle as well as local waste tire enforcement personnel in their efforts to detect and deter waste tire facility and hauling violations. If CHP is unable to continue this work after the current contract expires due to budget or priority issues, CalRecycle will pursue a similar agreement with other law enforcement agencies. This effort also includes surveillance and enforcement support focused on illegal activities related to tire exports through California ports and in the California-Mexico border region.

   Activity Funding
   FYs 2019–20 through 2023–24……$100,000 per fiscal year

3. **Local Government Waste Tire Enforcement Grant Program**
   This long-running grant program enhances California's waste tire enforcement infrastructure by providing noncompetitive grants to cities and counties that perform local waste tire inspection and enforcement activities. This program augments CalRecycle's enforcement efforts in overseeing the proper management and flow of waste tires throughout the state. Eligible entities are reimbursed for costs to identify waste tire sites, conduct waste tire facility inspections, investigate illegal tire disposal activities, conduct small tire pile cleanup (35 tires or less), review waste tire hauler documents, and issue notices of violation. They ensure that tire dealers, waste tire

processors, auto dismantlers, retreaders, tire haulers, and other waste tire entities comply with all applicable laws, storage standards, and manifest requirements. This program will allow waste tire grantees to be reimbursed for time that grantees spend training or coordinating with a local conservation corps to clean up waste tire piles and illegally dumped waste tires.

The program strives to provide consistent statewide inspection and enforcement coverage in a cost-effective and efficient manner. As a result of the program, local governments have an expanded role in the enforcement of these waste tire entities and are able to apply their unique local knowledge, thereby ensuring the proper management of California's annual production of over 44 million waste tires and improving the overall protection of public health, safety, and the environment.

Activity Funding
FYs 2019–20 through 2023–24 ……..……..……..…….$6,500,000 per fiscal year

4. **Database System Maintenance and Enhancement**
   The Waste Tire Management System (WTMS) tracks tire enforcement and manifest program activities. The system was developed per the requirements defined in the approved feasibility study report. The system tracks waste tire generators, registered waste tire haulers, permitted and unpermitted end-use facilities, manifest forms, inspection records, and enforcement actions.

   The system was initially released in July 2003 and has recently required the development of an upgraded user interface to operate with current technology and department standardized coding platforms and on more devices. Areas of ongoing maintenance and enhancement include:

   - Standard reports to track facility inspections, waste tire storage permits, grantee referrals, and notices of violation to ensure performance measures are achieved;
   - Ongoing enhancements to compliance reports that assist grantees with inspection prioritization and planning;
   - Ongoing maintenance that includes revising inspection forms and making now mandatory electronic inspection reporting efficient and cross-platform supported; and

- Continued, periodic upgrades to the system are anticipated as the program continues to grow and change to meet the needs of our internal and external stakeholders as well as CalEPA reporting requirements.

Activity Funding
FYs 2019–20 through 2023–24……..……..……$200,000 per fiscal year

5. **Tire Enforcement Inspector Technical Training**
These funds are used to supplement the tire portion of CalRecycle's annual technical training series for local waste tire enforcement agencies and CalRecycle tire enforcement staff. Training provides inspectors and managers with up-to-date information on CalRecycle's waste tire management policies, programs, and grants, as well as a venue to network and discuss other items of interest regarding the management of waste tires and emerging challenges or threats. Other outreach activities may also be held during the year. This annual training event offers concurrent technical sessions, and field tours provide an opportunity to network with other local enforcement agencies, tire enforcement agencies, CalRecycle staff, and industry representatives.

Activity Funding
FYs 2019–20 through 2023–24……..……..…….....$100,000 per fiscal year

Waste and Used Tire Hauler and Manifest Program

Hauler and Manifest Program Background and Status

The original waste tire manifest system was created in 1995 to provide documentation of waste tire transactions between the tire generator, tire hauler, and the end-use facility. A copy of a manifest form, a type of tracking receipt, was left with each of the respective parties as proof of the tire transaction and was retained at the place of business for three years, to be reviewed by authorized tire inspectors upon request. However, the information was not provided directly to CalRecycle, and therefore there was no simple way to track the movement of tires throughout the state. As a result, the Legislature passed SB 876 (Escutia, Chapter 838, Statutes of 2000) to better track the flow of waste and used tires in California, which required the development and implementation of a uniform statewide waste and used tire manifest program.

The California Uniform Waste and Used Tire Manifest System, developed pursuant to SB 876, went into operation in July 2003. This legislation established most of the waste currently regulated tire hauling requirements:

- Every person who transports 10 or more waste or used tires has to hold a valid tire hauler registration and use state-issued decals and manifests;
- A prospective hauler is required to post a $10,000 bond prior to obtaining registration;
- Tire haulers have to register annually with CalRecycle;
- Tire haulers have to possess manifests during the transport of waste or used tires;
- Tire haulers can only transport to legally authorized end-use facilities;
- Tire generators, haulers, and end-use facilities have to submit manifest forms to CalRecycle; and
- A person or end-use facility that receives more than 10 waste or used tires from an unregistered hauler has to report that hauler to CalRecycle and the number of tires being delivered.

The current Waste and Used Tire Hauler and Manifest Program primarily consists of two separate components: registration and manifesting. CalRecycle registers more than 1,400 California waste and used tire haulers annually, which includes more than 7,500 vehicles. Registrations expire annually at the end of each calendar year. CalRecycle

sends renewal packages to registered haulers well before the end of the year to ensure haulers can renew their registrations in a timely manner. Tire hauler registrations that are not renewed by the end of the calendar year are canceled. Current law allows exemptions from waste tire hauler registration requirements under certain conditions.

The manifest system tracks the movement of all waste and used tires throughout the state, documenting on average over 130 million tire pick-ups and drop-offs annually. Soon after the implementation of the new manifest system, CalRecycle staff realized that the system needed improvements regarding paperwork processing and data analysis. Therefore, after CalRecycle conducted workshops in 2004 and 2005 to gather input from stakeholders, the system was streamlined by developing a revised manifest form called the Comprehensive Trip Log form, typically referred to as a “CTL.” Utilizing this CTL form, the tire hauler submits manifest information on behalf of all parties in the tire transaction, which significantly reduced paperwork.

Later in 2006, CalRecycle provided haulers with an opportunity to transmit tire manifest information electronically using CalRecycle’s electronic data transfer (EDT) process. The EDT process resulted in additional program efficiency and cost-effectiveness as 46 percent of all manifest records were submitted electronically; today, that percentage remains approximately the same. Continued considerations for opportunities to further enhance the manifest system are critical as developments in technology become available that could make the system more efficient and could provide more equitable access to all stakeholders.

Improvements in the efficiency and reliability of the manifest program have greatly supported and contributed to CalRecycle’s enhanced enforcement and have resulted in increases in cases and fines. The increased enforcement efforts, number of prosecutions, and related demands on CalRecycle’s legal and program staff required a more expeditious method for processing these violations. In 2008, CalRecycle approved and implemented a six-month Streamlined Enforcement Pilot Program, which was modeled on similar protocols utilized by other state agencies. The use of a streamlined penalty letter process has been an overwhelming success in reducing enforcement-related costs and improving compliance and was approved as a permanent enforcement tool in 2009. To date, hundreds of penalty letters have been issued, and a high rate have been signed and returned with business owners agreeing to terms and penalty payments.

Objectives

The Hauler and Manifest Program has the following objectives:

1. To complement and support CalRecycle's waste tire enforcement program by providing comprehensive and auditable data on waste tire transactions between generators, haulers, and end-use facilities, thereby implementing SB 876 regulations, reinforcing compliance with SB 876, and reducing the incidence of illegal waste tire disposal.
2. To provide information on tire movements within the state and across borders to help support tire diversion and market development activities.
3. To manage a tire database that will collect, store, and report the necessary information for an effective program that regulates the usage of manifests to management the movement of tires, while regularly evaluating current technologies available that offer efficiencies for quality data collection, compliance from the regulated community, and equitable access to all stakeholders.

Performance Measures

The performance measures listed below have been streamlined and updated to align with the activities listed in this biennial revision of the Five-Year Plan. The Hauler and Manifest Program will use the following measures to evaluate success in achieving its objectives:

1. Reduce the number of registered waste tire haulers that do not submit manifests to no more than 5 percent of the active tire haulers.
2. Reduce the percentage of active tire haulers whose manifest form error rate is greater than 10 percent.
3. Track the number of complaint forms received, including the "204 Form" from solid waste disposal sites documenting unregistered hauling vehicles transporting more than 10 tires, hauler observation forms reporting waste tire haulers that may be violating waste tire hauler and manifesting requirements, and waste tire complaints received from the public.
4. Monitor the quantity of waste or used tires being picked up or delivered annually.

Activity Description and Budget

The hauler and manifest program budget line item is shown in Table 3. The costs associated with this budget include the following:

1. Printing, mailing, and return postage for the Comprehensive Trip Log (CTL) waste tire manifest forms that are provided free of charge to California's 1,400-plus registered waste tire haulers;
2. Printing registered waste tire hauler decals and certificates and Tire Program identification number certificates;
3. Training and educational materials;
4. Contractor support to scan and conduct data entry of the returned CTL forms; and
5. Augmenting CalRecycle's Information Technology Services Branch annual budget for manifest and hauler registration-related upkeep and maintenance of the WTMS database.

Table 3: Budget for the Waste and Used Tire Hauler Program and Manifest System

Program Area	FY 2019–20	FY 2020–21	FY 2021–22	FY 2022–23	FY 2023–24
Hauler Program and Manifest System	$450,000	$450,000	$450,000	$450,000	$450,000
Totals	**$450,000**	**$450,000**	**$450,000**	**$450,000**	**$450,000**

Hauler Program and Manifest System

Budgeted funds cover the cost of registration and manifesting documents issued to California's 30,000 plus waste tire entities. Overall costs for the manifest program have been reduced over time with the implementation of program efficiencies and as process advancement becomes available. Funds also will be allocated to the following projects:

Waste Tire Hauler Portal

CalRecycle will continue development and expansion of its online waste tire hauler portal. CalRecycle designed the WTMS database hauler portal to enable California's 1,400-plus waste tire haulers to complete most activities associated with applying for and annually renewing their waste tire hauler registrations, as well as managing their business' hauler information.

Waste Tire Hauler Training Workshops

CalRecycle will continue conducting free, bilingual training workshops throughout California, with a special emphasis on the California-Mexico Border region, to augment annual hauler registration renewal outreach and educational efforts and to inform and educate waste tire haulers of their roles and responsibilities under California's waste tire compliance system.

Activity Funding

FYs 2019–20 through 2023–24 ……..…..…$450,000 per fiscal year

Cleanup, Abatement, or Other Remedial Actions Related to Tire Stockpiles Throughout the State

Cleanup Program Background and Status

The cleanup program consists of short-term remediation projects, four grant programs, and the emergency reserve account.

Since 1995, CalRecycle has removed more than 660,000 tons of illegal waste tires and contaminated debris from 80 sites at a total cost of more than $43 million. While the number of sites remediated each year has generally decreased since 1999, the cleanup costs have varied significantly depending on the number of large or complex projects undertaken in any year. No waste tire sites were cleaned in years 2007, 2010, 2013, 2016, and 2018; therefore, no funds were expended.

Table 4: Tire Remediation Data for Short- and Long-Term Remediations

Year	Number of Sites	Tons of Tires Remediated	Remediation Cost
1995	6	21,544	$870,832
1996	6	4,114	$389,487
1997	9	28,329	$1,367,760
1998	8	43,565	$2,515,592
1999	15	11,867	$1,442,688
2000	6	46,029 [1]	$3,340,505
2001	1	36,209 [1]	$2,162,000
2002	2	214,417 [1]	$11,624,345
2003	1	27,707 [1]	$1,849,943
2004	1	148,833 [1]	$9,836,885
2005	10	72,941 [1]	$4,300,000
2006	2	1,285	$506,405
2007	0	0	$0
2008	2	881	$235,011
2009	5	1,628 [1, 2]	$1,536,161

Year	Number of Sites	Tons of Tires Remediated	Remediation Cost
2010	0	0	$0
2011	1	443	$177,700
2012	1	80 [2]	$599,494
2013	0	0	$0
2014	2	268	$250,000
2015	1	5	$16,000
2016	0	0	$0
2017	1	25	$50,722
2018	0	0	0
Totals	**80**	**660,095**	**$43,051,530**

[1] These totals include tons of contaminated debris removed.[2] They also include a joint project with the Short-Term Remediation Program and Solid Waste Cleanup Program in the Tijuana River Valley. See discussion in the Cleanup Program section of Appendix B.

The Local Government Waste Tire Cleanup Grant Program provides funding to California jurisdictions including cities, counties, special districts, other political subdivisions and jurisdictions joined together by formal agreements, as well as qualifying California Indian tribes that are eligible for the cleanup of tires that have been illegally disposed along rights-of-way and on private property. For Fiscal Year 2018-19, eligible applicants could apply for up to $100,000 for individual grants and up to $250,000 for regional grants. Since 1997, CalRecycle has provided more than $14 million to fund 266 grants. Table 5 below summarizes the grant program.

Table 5: Local Government Waste Tire Cleanup Grant Program

Fiscal Year	Number of Grants	Amount Awarded
1997–98	8	$171,286
1998–99	4	$51,768
1999–00	6	$213,126
2000–01	0	*
2001–02	8	$449,889
2002-03	11	$646,260
2003–04	14	$712,286

Fiscal Year	Number of Grants	Amount Awarded
2004–05	16	$735,511
2005–06	20	$778,044
2006–07	20	$845,867
2007–08	15	$790,923
2008–09	15	$834,943
2009–10	19	$1,027,855
2010–11	21	$1,081,559
2011–12	0	**
2012–13	23	$1,723,223
2013–14	0	***
2014–15	23	$1,715,882
2015–16	0	***
2016–17	23	$1,589,369
2017–18	0	***
2018–19	20	$1,354,412
Totals	**266**	**$14,722,203**

** No funds available—sunset of tire fee. **Grant program was suspended to transition to a two-year term. ***Funding was allocated (on an alternating-year basis) to the Local Government Waste Tire Amnesty Grant Program.*

The Local Government Waste Tire Amnesty Grant Program provides funding to California jurisdictions—including cities, counties, special districts, jurisdictions joined together by formal agreements, and qualifying California Indian tribes—to hold collection events in convenient locations for the public to bring in their waste tires for free. Since 1992, CalRecycle has provided more than $15 million in funding by awarding 506 grants. For Fiscal Year 2019–20, applicants are eligible to apply for a maximum of $40,000 for single jurisdiction applicants and $90,000 for regional applicants. Due to increased concerns about waste tires in the border region, CalRecycle will prioritize San Diego and Imperial Counties. Table 6 summarizes the grant program.

Table 6: Local Government Waste Tire Amnesty Grant Program

Fiscal Year	Number of Grants	Amount Awarded
1992–93	4	$59,100
1993–94	8	$177,720
1994–95	13	$387,989
1995–96	1	$12,744
1998–99	16	$176,543
1999–00	26	$374,043
2000–01	0	*
2001–02	22	$330,817
2002–03	11	$321,247
2003–04	29	$924,674**
2004–05	17	$704,793
2005–06	31	$808,879
2006–07	33	$807,416
2007–08	43	$1,198,594
2008–09	40	$1,240,311
2009–10	43	$1,320,772
2010–11	43	$1,368,441
2011–12	0	***
2012–13	0	****
2013–14	52	$2,034,136
2014–15	0	****
2015–16	36	$1,720,495
2016–17	0	****
2017–18	38	$1,619,916
Totals	**506**	**$15,689,209**

** No funds available—sunset of tire fee. ** The number of applicants increased because no matching funds were required. ***Grant program was suspended to transition to a two-year term. ****Funding was allocated (on an alternating-year basis) to the Local Government Waste Tire Cleanup Grant Program.*

The Governor's Budget annually allocates $5 million to the Local Conservation Corps (LCCs) Grant Program from the tire fund. CalRecycle encourages LCCs to assist jurisdictions with cleanup and amnesty grant events because leveraging these resources could potentially enable more jurisdictions to receive grants for this purpose.

The ways in which an applicant might coordinate with LCCs include, but are not limited to, assisting with planning or running an amnesty event, creating and distributing public education/advertising materials, and covering the cost of tire hauling.

Direction Provided by SB 876

Public Resources Code (PRC) section 42889(b) provides that:

"These (Tire Recycling Management Fund) moneys shall be expended for…the following purposes:

(5) To pay the costs of cleanup, abatement, removal, or other remedial action related to tire stockpiles throughout the state, including all approved costs incurred by other public agencies involved in these activities by contract with the board.

(9) To pay the costs to create and maintain an emergency reserve, which shall not exceed one million dollars ($1,000,000).

(10) To pay the costs of cleanup, abatement, or other remedial action related to the disposal of waste tires in implementing and operating the Farm and Ranch Solid Waste Cleanup and Abatement Grant Program established pursuant to Chapter 2.5 (commencing with Section 48100) of Part 7."

Further, Public Resources Code section 42885.5 provides that:

(9) Grants to certified community conservation corps and community conservation corps, pursuant to paragraph (3) of subdivision (a) of, and paragraph (3) of subdivision (b) of, Section 17001, for purposes of the programs specified in paragraphs (2) and (6) and for related education and outreach.

Objectives

The Cleanup Program has the following objectives:

1. Eliminate illegal waste tire stockpiles throughout California, either directly or through grant assistance, where the responsible parties have failed to take appropriate action
2. Decrease illegal waste tire dumping by assisting local governments through grant funds in developing public education materials on proper maintenance and disposal of automobile tires and promoting waste tire amnesty events for the general public
3. Assist victims of illegal dumping on farm and ranch properties in cleaning up waste tires
4. Direct tires from cleanup to productive end use rather than landfill disposal to the greatest extent possible within reasonable cost parameters
5. Prioritize cleanup in San Diego and Imperial Counties

Performance Measures

The performance measures listed below have been streamlined and updated to align with the activities listed in this biennial revision of the Five-Year Plan:

1. Complete the short-term waste tire remediation projects referred by the enforcement program in a timely manner and report status of projects to CalRecycle on an annual basis
2. Increase the number of tires collected/remediated through Farm and Ranch Cleanup, Tire Cleanup, Tire Amnesty, and Local Conservation Corps grants by 10 percent annually
3. Increase the number of tires collected/remediated in San Diego and Imperial Counties

Activity Description and Budget

The cleanup program will continue to clean up illegal tire piles with CalRecycle-managed contractors and grants. The Local Conservation Corps will continue to assist local governments with cleanup and collection activities. Also, CalRecycle will continue an emergency reserve account, which cannot exceed $1,000,000, as directed by SB 876. Table 7 provides a list of activities and associated budgets for this element.

Table 7: Budget for Cleanup, Abatement, and Remedial Action

Program Area	FY 2019–20	FY 2020–21	FY 2021–22	FY 2022–23	FY 2023–24
Short-Term Remediation Projects	$300,000	$300,000	$300,000	$300,000	$300,000
Local Conservation Corps Grant Program	$5,000,000	$5,000,000	$5,000,000	$5,000,000	$5,000,000
Local Government Waste Tire Cleanup Grant Program	$0	$1,500,000	$0	$1,500,000	$0
Local Government Waste Tire Amnesty Grant Program	$1,661,000	$0	$1,500,000	$0	$1,500,000
Emergency Reserve Account	$300,000	$300,000	$300,000	$300,000	$300,000
Farm and Ranch Solid Waste Cleanup and Abatement Grant Program*	$400,000	$400,000	$400,000	$400,000	$400,000
Totals	**$7,661,000**	**$7,500,000**	**$7,500,000**	**$7,500,000**	**$7,500,000**

** Funds transferred to Farm and Ranch Solid Waste Cleanup and Abatement Grant program.*

1. **Short-Term Remediation Projects**

   Public Resources Code (PRC) Section 42846 allows CalRecycle to perform any cleanup, abatement, or remedial work required to prevent substantial pollution, nuisance, or injury to public health and safety at waste tire sites where the responsible parties have failed to take appropriate action. CalRecycle funds short-term remediation of illegal waste tire sites with CalRecycle-managed contracts, which may be used to stabilize piles until removal, remove all waste tires, and remediate the site after the tires have been removed.

   Activity Funding

   FYs 2019–20 through 2023–24……..……$300,000 per fiscal year

2. **Local Conservation Corps Grant Program**
   The purpose of the grant program is to implement beverage container recycling and litter abatement programs, recycling activities related to the collection and recovery of used oil and electronic waste, and the cleanup and abatement of waste tires. Eligible applicants are local conservation corps (LCCs) that are designated by a county to perform litter abatement, recycling, and related activities, and are certified by the California Conservation Corps as having operated for a minimum of two years and as meeting all other criteria of PRC section 14507.5. This program expends funding from the California Beverage Container Recycling Fund, Electronic Waste Recovery and Recycling Account, California Tire Recycling Management Fund, and California Used Oil Recycling Fund. Eligible activities may include cleanup events, education and outreach, event labor and staff resources in partnership with local jurisdictions, collection and hauling services (if permitted), and other projects allowed under PRC sections 17001(b)(3) and 42872. The LCCs currently assist local governments with waste tire cleanup and collection activities. CalRecycle works with the LCCs to support the availability of these services in areas of the state not traditionally serviced by the LCCs.

   Activity Funding
   FYs 2019–20 through 2023–24……$5,000,000 per fiscal year

3. **Local Government Waste Tire Cleanup Grant Program**
   This grant program is designed to pay for the cost of cleanup of illegally dumped waste tires. Funds are available for the collection, removal, transportation, recycling, and disposal of California waste tires from tire piles and areas where illegal dumping has occurred. Funds are limited to the removal of waste tires along public rights-of-way and on private property with either: (a) less than 500 tires on site, or (b) 500 to 4,999 tires if the property owner signs an affidavit stating that they did not bring the tires on site or allow others to bring the tires on site. Local governments including cities, counties, special districts, other political subdivisions and jurisdictions joined together by formal agreements, as well as qualifying Indian tribes, are eligible for funding. Cities or counties may submit a regional application with authorization from other cities and counties participating in the regional application. Priority will be given to applicants that demonstrate coordination with a Local Conservation Corps. Eligible costs for this coordination will be described in the procedures and requirements section of the grant agreement CalRecycle will prioritize San Diego and Imperial Counties and will conduct outreach in this region to increase awareness of this grant program and funding opportunities. .

Activity Funding
FYs 2020–21 and 2022-23……..$1,500,000 per fiscal year

4. **Local Government Waste Tire Amnesty Grant Program**
This grant program is designed to help divert waste tires from landfill disposal and prevent illegal tire dumping. Funds pay for waste tire collection events that are held in convenient locations for the public to bring in their used tires at no charge. An amnesty event can also consist of a coupon program that allows citizens to bring in their tires on specified days. Amnesty events are not intended for the disposal of waste tires from waste tire generating businesses (PRC §42954(7)). Local governments—including cities, counties, special districts, other political subdivisions and jurisdictions joined together by formal agreements, as well as qualifying Indian tribes—are eligible for funding. Cities or counties may submit a regional application with authorization from other cities and counties participating in the regional application. Priority will be given to applicants that demonstrate coordination with a Local Conservation Corps. Eligible costs for this coordination will be described in the procedures and requirements section of the grant agreement. Priority for this program will be San Diego and Imperial Counties, and outreach will be conducted on both sides of the border, in collaboration with CalEPA's Border Affairs Office.

Activity Funding
FY 2019–20……$1,661,000
FY 2021–22 and 2023–24……$1,500,000 per fiscal year

5. **Emergency Reserve Account**
SB 876 required CalRecycle to create and maintain an emergency reserve account, which shall not exceed $1,000,000. Funding for FYs 2019/2020 through 2023/2024 is proposed at $300,000. These funds will be used to respond to emergencies involving waste tires (e.g., tire fires). This emergency reserve account is subject to change depending on the need to fund cleanups for any emergencies that arise. While CalRecycle is required to maintain funds in this account with expenditure authority for emergency purposes, more than $1,000,000 may be expended on a yearly basis. If allocated funds are not expended, funds may be carried forward to the fund balance in the following fiscal year.

Activity Funding
FYs 2019–20 through 2023–24 ..... ……$300,000 per fiscal year

6. **Farm and Ranch Solid Waste Cleanup and Abatement Grant Program**
   The purpose of this grant program is to provide funding for the cleanup of illegal solid waste sites on farm or ranch property. A site may be eligible for funding if the parcels are zoned for agricultural use, unauthorized solid waste disposal has occurred, and the sites are in need of cleanup in order to abate a nuisance, a public health and safety threat, or a threat to the environment. Tire piles can attract more dumping, so cleaning up these sites will help deter future illegal dumping of tires. SB 876 requires that transferred tire funds be allocated to pay the costs of cleanup, abatement, or other remedial action related to the illegal disposal of whole waste tires on farm or ranch properties. Other non-tire cleanup costs are paid for using other program funding sources.

   Activity Funding
   FYs 2019–20 through 2023–24 ....$400,000 per fiscal year

Research Directed at Promoting and Developing Alternatives to the Landfill Disposal of Tires and Market Development and New Technology Activities for Waste and Used Tires

Program Background and Status

As in the previous edition of this Plan, CalRecycle has combined the Research Program and the Market Development Program into one element because of the close relationship between the activities. In addition, CalRecycle has combined all research and technical support activities for tire-derived aggregate (TDA) into one line and all research and technical assistance activities for rubberized asphalt concrete (RAC) into another line.

Research and Technical Support

Over the years, CalRecycle has investigated a variety of waste tire diversion alternatives through internally generated research contracts and literature reviews of worldwide studies. These efforts have helped CalRecycle focus on a mixture of strategies to divert the majority of waste tires from landfills. To date, projects involving TDA, RAC, energy recovery, molded rubber products, and other tire-derived product applications have been explored. So far, TDA, RAC, and molded products uses have shown the greatest promise for diverting a significant portion of the millions of tires currently being landfilled. However, those applications cannot by themselves divert all of the remaining landfilled tires. Therefore, CalRecycle continues to refine its knowledge of existing technologies but will also research new and innovative applications.

Tire Derived Aggregate (TDA) Research

Research efforts have enabled CalRecycle to make significant progress in the development of several long-term sustainable markets for TDA. These research efforts include the use of TDA as a vibration mitigating material in light rail applications, a lightweight fill material for embankment and landslide repair, a civil engineering application in landfills, a gravel replacement in on-site wastewater treatment systems, and as a storm water drainage and treatment media.

A relatively new CalRecycle funded TDA application is the use of TDA in storm water infiltration galleries. These galleries help manage stormwater runoff by retaining water rather than conveying it directly to the management system. It also satisfies the California Water Board's low impact development (LID) requirement. Most recently, a storm water infiltration gallery project in the City of Ukiah, partially funded by CalRecycle, was awarded the 2019 Engineering Excellence Award by the American Council of Engineering Companies.

Another recent example of CalRecycle's research efforts include investigations conducted by UC San Diego (UCSD) to explore the advantages of using TDA by better defining its material properties. The research conducted by UCSD allowed CalRecycle to partner with Santa Barbra County to design a highway repair project utilizing TDA in a mechanically stabilized earth application. Construction is scheduled for Spring 2019.

CalRecycle also continues to fund research conducted by CSU Humboldt to investigate the impacts that TDA has on water quality. Past studies have demonstrated that TDA has minimal impacts on water quality. This means TDA can be safely used as a surface water drainage and treatment media in low-impact development projects. This research has enabled several Butte and Sonoma Counties to successfully construct LID projects using TDA as a means to manage storm water runoff.

The success of these research efforts has allowed CalRecycle to identify new TDA applications, which have created new markets for recycled waste tires. CalRecycle considers TDA to be one of the top-priority markets for waste tires diverted from landfills and will continue its TDA research activities in an effort to create long-term sustainable markets for TDA. Future research efforts could include further analysis of the seismic dampening properties of TDA for use in retaining walls and in mechanically stabilized TDA applications.

Rubberized Asphalt Concrete (RAC) Research

CalRecycle continues to promote rubber paving applications, such as RAC overlays and rubber chip seals, which has successfully resulted in the continued increase of RAC used in projects statewide. Research has played a key role in CalRecycle's efforts to increase the use of rubber in paving applications. These research efforts include investigation into the use of rubberized recycled asphalt pavement (RAP) into new RAC pavement, the effectiveness of warm mix additives to rubber pavements, life cycle cost analysis, and the development of rubber overlay and chip seal performance models.

CalRecycle continues to contract with the University of California Pavement Research Center to investigate performance grading (PG) testing methods for asphalt rubber binders and methods for determining the rubber content in terminal blend binders. This research project may ultimately lead to the expansion of the use of asphalt rubber and terminal blend binders in future highway projects.

Under previous contracts with CalRecycle, the CSU, Chico Research Foundation developed performance curves for asphalt rubber hot mix for use in current performance models typically used by local government to select strategies for their pavement projects. CalRecycle is again collaborating with the Foundation to develop performance curves for rubber chip seal projects. Once developed, these curves will be utilized in performance models used by local governments, which will ultimately lead to more rubber chip seal use. The Foundation will conduct outreach and training to local governments to promote and educate them on the use of the performance curves developed under their studies. These efforts will help local agencies determine the best projects for using rubber paving applications.

CalRecycle has contracted with Caltrans to conduct research in support of their PG+X proposal. This proposal would require the use of a minimum of 5-10 percent crumb rubber in all asphalt binder that Caltrans currently classifies as unmodified, which could significantly increase the diversion of waste tires from CA landfills. Through meetings with stakeholders, Caltrans has identified 16 research proposals needed to implement their PG+X proposal.

CalRecycle will continue to study new and evolving rubber paving applications to gain additional information regarding their benefits and drawbacks. If ongoing research supports the benefits of these new applications, CalRecycle can market and promote the use of these applications by including them in future grant offerings, with the aim of enhancing sustainable markets for additional waste tires. Additionally, CalRecycle will evaluate current design standards and investigate pavement preservation strategies that use rubber and increase the lifespan and performance benefits (e.g., resistance to reflective cracking, skid resistance, noise reduction) of pavements.

Tire-Derived Product (TDP) and Technology Research

There is no one tire market that will cause the diversion of all waste tires from California landfills, so CalRecycle needs to continue to conduct research in support of its efforts to promote existing tire-derived products as well as identify new ones. There is also a need to evaluate end-of-life options for various TDPs, including turf applications and playgrounds, to ensure the continued viability of these tire-derived product uses.

As part of its effort to achieve a diversified and sustainable market for recycled waste tires, CalRecycle will continue providing technical assistance to facilitate manufacturers producing products using crumb rubber and to support material testing and the industry's use of American Society for Testing and Materials (ASTM) standards for crumb rubber. Previous efforts have resulted in innovative new products, necessary testing that allowed expansion of markets for existing products, and new uses for end-of-life crumb rubber.

In an effort to support uses higher in the waste management hierarchy, CalRecycle proposes to encourage and support greater use of retread truck and off-the-road tires. Since each truck tire represents approximately five passenger tire equivalents, improvements in the use of retread truck tires (and the elimination of those truck tires from the waste stream) could significantly improve the state's waste tire recycling rate. CalRecycle will collaborate with industry and stakeholders to identify issues and barriers and propose solutions to increase the use of retread truck and off-the-road tires.

Due to the concern regarding the use of tire rubber in artificial turf fields, CalRecycle will continue to assess any new information regarding the human health and environmental risks associated with this application. CalRecycle contracted with the Office of Environmental Health Hazard Assessment (OEHHA) to review previous scientific studies and conduct additional research on the health effects of crumb rubber in synthetic field turf. The Report to the Legislature: Report on Health Impacts of Outdoor Artificial and Natural Turf Fields was published in 2011. CalRecycle and OEHHA entered into a new interagency agreement in 2014–15 to conduct a more exhaustive study of the potential health impacts associated with rubber in synthetic turf fields. OEHHA has held three scientific advisory panel meetings to discuss the study design and solicit recommendations from a panel of experts in statistics, toxicology, biomonitoring, and other fields related to the study. OEHHA has collected samples from 33 fields around the state and is currently analyzing the samples for metal, volatile organic compounds, and other chemicals to develop a model to assess human health

impacts. The final report will be available in late 2019. More information on the report can be found on OEHHA's website.

CalRecycle may also perform research on innovative and emerging technologies that utilize waste tires to study and determine whether they are viable in the current tire market and if there are health and safety impacts that could adversely impact their use. Research can also be performed regarding the changing biogenic component of tires and the potential impact on recycling and recycled-content products. To support manufacturers and consumers in making production and purchasing decisions to help reduce greenhouse gases (GHG), CalRecycle may also develop protocols for measuring baseline and changes in GHG for various products.

California-Mexico Border Region Project

While the majority of tires managed by CalRecycle are waste tires, each year a portion of the used tires generated in California are of sufficient quality to be reused within the state or exported abroad, primarily to Baja California, Mexico. Eventually those used tires become waste tires. Based on information from the late 2000s, about two-thirds of waste tires in Baja California are diverted for use as tire-derived fuel for cement kilns or as construction material, but the remaining one-third are illegally disposed, some of which end up in the Tijuana River Valley.

CalRecycle has funded and engaged in a range of border-related activities over the past several years in response to the environmental problems associated with waste tires in the border region (see Appendix B), including:

- Tire flow studies in 2009 and 2017 tire flow studies,
- California Highway Patrol surveillance work to identify legacy tire piles in the border region,
- Two CalRecycle-managed cleanups of the Goat Canyon debris basins in Border Field State Park,
- A University of California Berkeley report on the development of an integrated waste management plan for the State of Baja California, and
- Training for approximately 50 Mexican tire haulers regarding California's waste tire hauler registration and manifest program.

While modest progress and increased awareness of waste tires issues has been realized along the border region, the environmental problems associated with waste tires and much larger amounts of solid waste and sediment in the border region persist and continue to impact water quality in the Tijuana River estuary.

Long-term resolution requires continued collaboration and coordination with interested parties on both sides of the border, and any such efforts should be transparent to and involve other stakeholders, including local governments and nonprofit organizations. Regarding waste tire cleanup along the border, CalRecycle continues with activities that:

1) better define the problem by obtaining updated information on how and where used and waste tires are being transported and stored (including in tire piles) along the border region and on associated economic aspects; and

2) work with CalEPA and its existing MOU with the Mexican government, along with other interested partners, to clarify and prioritize which projects (including targeted cleanup activities in the future) would best contribute to long-term environmental protection in the border region.

3) CalRecycle will prioritize funding waste tire cleanup and tire amnesty events in San Diego and Imperial Counties.

Potential partners include the U.S. Environmental Protection Agency and existing CalEPA partnerships, such as the California-Mexico Border Relations Council's Border Region Solid Waste Working Group (SWWG), the California-Mexico MOU Working Group, and other governmental and non-governmental organizations such as the Tijuana River Valley Recovery Team.

The SWWG—comprised of CalRecycle, San Diego and Colorado River Regional Water Quality Control Boards, the California Department of Parks and Recreation, and CalEPA—published its Solid Waste and Waste Tire Strategic Plan in January 2017. This multi-agency framework highlights program, cleanup, and outreach recommendations to address both short-term and long-term environmental issues along the border relative to waste tires, solid waste, and sedimentation. The plan's overarching theme emphasizes the importance of collaboration and consultation with local and regional governments in California and Mexico on programmatic infrastructure strategies to improve materials management and environmental protection. This set of activities also involve participation with the California Department of Parks and Recreation and the San Diego and Colorado River Regional Boards on current cleanup initiatives.

Market Development

CalRecycle continues to promote the development of long-term, sustainable markets for waste tires. The goal is to achieve and sustain high diversion and recycling rates by helping to create:

1. Strong customer demand by both government and private sector purchasers for a wide variety of tire-derived products (TDPs).

2. A thriving TDP production infrastructure composed of California manufacturers, contractors, and engineering companies able to consistently produce and install high-quality, tire-derived products satisfying customer demand while utilizing effective marketing and sales capabilities.

3. A resilient, statewide supply infrastructure for collecting waste tires generated throughout California and producing high-quality, tire-derived materials, including TDA or crumb rubber that satisfies the needs of TDP manufacturers and producers.

CalRecycle's waste tire market development program employs several complementary strategies, including:

- Research to identify and evaluate new TDPs and market development opportunities;
- Technical assistance and pilot projects to demonstrate the economic and technical feasibility of new products, technologies, and applications;
- Funding support through grants, incentives, and low-interest loans to help encourage qualified entities to produce and purchase TDPs;
- Training and outreach activities to help raise awareness about the range of TDPs available in California, including their benefits and applications; and
- Ongoing monitoring to track progress and update information on opportunities and barriers.

These strategies are being applied in three product categories: TDA used in civil engineering applications; crumb rubber used in rubberized pavement applications; and a broad category comprising all other TDPs.

TDA Market Development

Through CalRecycle's research efforts and the successful performance of TDA projects constructed to date, TDA has proven to be a cost-effective and reliable alternative to conventional construction materials. These benefits, along with the ability to use large quantities of waste tires, demonstrate that TDA has great market potential. As such, CalRecycle will continue to aggressively promote its use in civil engineering applications by continuing to conduct outreach and education and by providing funds for the TDA Grant Program that started in 2012.

RAC Market Development

Over the years, CalRecycle has provided support to local agencies for RAC and rubberized chip seal projects. Through the Rubberized Pavement Grant Program, many new paving projects have either been completed or are being planned in California. When compared to conventional asphalt, RAC saves money, provides greater skid resistance, is quieter, and lasts longer than conventional asphalt. CalRecycle has successfully promoted the product's benefits through workshops, conferences, RAC technical centers, performance models, and other outreach efforts.

Other TDP Market Development

CalRecycle is also promoting expansion of diversified markets involving a wide range of TDPs, with applications in a variety of different market segments. Examples include:

- Building construction products such as flooring, roofing, sealants and pipe couplings;
- Various traffic-related devices, delineators, and cones;
- Accessibility products such as landing applications, edge reducers, and accessible walkways;
- Outdoor surfacing such as tiles, pavers and mats;
- Pour-in-place and other playground surfacing applications; and
- An ever-growing list of other products and applications, such as cleaning supplies, and paints and coatings.

Through the Tire Incentive Program and the Tire-Derived Product Grants program, CalRecycle provides funding to help incentivize tire-derived material and TDP suppliers to expand product innovation and marketing and to help support purchase of diverse TDPs. The Feedstock Conversion Technical Assistance and Material Testing Services contract provides critical testing and certification services necessary for manufacturing new products and expanding markets for existing products. Through the Tire Outreach and Market Analysis contract, CalRecycle maintains the online California Tire-Derived

Product Catalog; conducts outreach to train architects, government agencies and others on the range of TDPs available; researches new TDPs and applications; and prepares an annual Waste Tire Market Report documenting market trends and the current diversion and recycling rate. These reports can be found in CalRecycle's Publications Catalog at https://www2.calrecycle.ca.gov/Publications/ CalRecycle will also coordinate with the Governor's Office of Business and Economic Development, which offers a variety of incentive and financing programs to encourage business development in California.

Direction Provided by SB 876

SB 876 includes legislative intent language as follows (from 2000 uncodified law, SB 876):

> *"(g) The purpose of this act is to do all of the following:…(2) Encourage tire manufacturers to promote the use of retreaded and longer-lasting tires, as well as develop recycled-content rubber tires."*
>
> Public Resources Code section 42889(b) states:
>
> *"The remaining moneys collected pursuant to Section 52885 shall be used to fund the waste tire program, and shall be appropriated to the board in the annual Budget Act…[and] shall be expended…for the following purposes:…*
> *1) To make studies and conduct research directed at promoting and developing alternatives to the landfill disposal of waste tires."…*
> *(7) To assist in developing markets and new technologies for used tires and waste tires. The board's expenditure of funds for purposes of this subdivision shall reflect the priorities for waste management practices specified in subdivision (a) of PRC Section 40051."*

Objectives

The research and market development element has the following objectives:

1. Conduct research and establish programs that support and promote new technology, new uses for waste tires, and improvements to products that use California-generated waste tires and tire-derived material.

2. Identify research gaps in existing data and determine what areas need further investigation.
3. Increase the use of RAC and TDA by providing funds and technical assistance to state agencies, local governments, and businesses.
4. Increase the purchase of TDPs (other than RAC or TDA) by providing services and funding to offset costs and promote sustainable purchase practices.
5. Increase the production capability and cost-effectiveness of processing waste tires into value-added products by offering incentives to businesses.

Performance Measures

The performance measures listed below have been streamlined and updated to align with the activities listed in this Biennial Revision of the Five-Year Plan.

1. Increase the amount of waste tires recycled to 75 percent by 2020.

2. Conduct research to address critical barriers to increasing markets for waste tire products and technologies (e.g., manufacturing rubber products using crumb rubber, RAC PG+5 issues, turf field health, and environmental impacts) and incorporate research findings in education, marketing, and outreach materials to continue to promote these applications.

3. Increase the amount of waste tire material used in priority market segments, including RAC, molded and extruded products, and civil engineering.

4. Support the increase in waste tire processing capacity to facilitate the 75 percent recycling goal.

Activity Description and Budget

CalRecycle is proposing to continue funding tire-derived aggregate (TDA) and rubberized asphalt concrete (RAC) research and technical support; funding support of Caltrans specifications development; research on retreads; and feedstock conversion assistance and material testing. This will continue CalRecycle's focus on RAC, TDA, and other tire-derived products that use the largest number of tires. Since a large number of tires can be diverted through RAC and TDA applications, significant resources are being devoted to them. Table 9 provides the budget for this element.

Table 9: Budget for Research and Market Development Activities

Program Area	FY 2019–20	FY 2020–21	FY 2021–22	FY 2022–23	FY 2023–24
Tire-Derived Aggregate Civil Engineering Technical Support; Research Efforts; Technology Center and Laboratory Testing Services	$1,050,000	$950,000	$750,000	$500,000	$500,000
Rubberized Asphalt Concrete Technical Support and Research	$550,000	$650,000	$650,000	$650,000	$650,000
Caltrans PG+X Binder Project	$350,000	$350,000	$0	$0	$0
Research on TDPs and Technologies Using Waste Tires	$250,000	$250,000	$250,000	$250,000	$250,000
Retread Tire Research	$250,000	$0	$0	$0	$0
Feedstock Conversion Assistance and Material Testing	$0	$0	$150,000	$0	$150,000
Tire-Derived Aggregate Grant Program	$850,000	$850,000	$850,000	$850,000	$850,000
Rubberized Pavement Grant Program	$4,002,000	$4,387,000	$3,787,000	$5,187,000	$4,037,000
Tire-Derived Products Grant Program	$1,000,000	$0	$1,000,000	$0	$1,000,000
Tire Incentive Program	$3,500,000	$4,500,000	$4,500,000	$4,500,000	$4,500,000
Tire Outreach and Market Analysis	$350,000	$350,000	$350,000	$350,000	$350,000
Tire Events	$75,000	$100,000	$100,000	$100,000	$100,000
Totals	**$12,227,000**	**$12,387,000**	**$12,387,000**	**$12,387,000**	**$12,387,000**

Note: CalRecycle is discussing whether it is feasible to combine the various market development grant programs (i.e., Tire-Derived Aggregate Grant Program, Rubberized Pavement Grant Program, Tire-Derived Grant Program, and Tire Incentive Program) into one larger Tire Recycling Incentive Program using existing expenditure authority, pursuant to PRC 42872(g).

1. **Tire-Derived Aggregate (TDA) Civil Engineering Technical Support; Research Efforts; and Technology Center and Laboratory Testing Services**
   CalRecycle will continue to provide technical support to address issues associated with the use of TDA in civil engineering projects, research to investigate new TDA applications, and laboratory testing services to assure compliance with TDA specifications. As shown in the activity funding below, funding for these efforts will vary between $500,000 and $1,050,000 per fiscal year. This is done to accommodate the award cycles for the contracts needed to support CalRecycle's Technical Support Contracts.

   - **Tire-Derived Aggregate Civil Engineering Technical Support**
     CalRecycle's technical support efforts will promote the use of TDA through technical assistance and targeted outreach to industry, associations, and others who will use TDA. CalRecycle also directs its technical assistance contractor to develop technology transfer materials that showcase the performance and cost benefits of using TDA. The technical assistance contractor will present these materials and serve as a CalRecycle liaison at various key stakeholder group workshops and conferences.

   - **TDA Research Efforts**
     Under this activity, CalRecycle will continue to investigate new civil engineering uses for waste tires, including partnering with state, local, and private-sector engineers to conduct research and to train and educate them on the use of TDA in their projects. For research projects focusing on specific civil engineering uses of waste tires, CalRecycle may implement project-specific contracts. These projects could include, but are not limited to, erosion control, earthquake damping, vibration mitigation, retaining and sound walls, storm water runoff and drainage control, exothermic reactions in TDA fill, and septic tank leach field applications. A recent example that evolved from CalRecycle research efforts is a project that will be done in partnership with Santa Barbara County to demonstrate the feasibility of using TDA in a mechanically stabilized earth application. The proposed project will repair and relocate a section of road on a steep hillside.

   - **Tire-Derived Aggregate Technology Center and Laboratory Testing Services**
     CalRecycle will continue its partnership with a contractor who has knowledge and experience with the TDA and RAC material specifications in California. Through

the TDA Technology Center, the contractor will provide statewide technical assistance to local governments through direct consultation and presentations at local and regional workshops related to material specifications for both TDA and RAC. CalRecycle may request that the contractor participate in environmental studies that relate to TDA and RAC. To assure compliance with material specifications, the contractor will also provide validation-testing services in support of CalRecycle RAC and TDA projects. The contractor will also continue to provide curriculum development support to California universities to educate the next generation of engineers on the benefits of using TDA.

Activity Funding

FY 2019–20……..…….. $1,050,000
FY 2020–21……..…….. $950,000
FY 2021–22…… ……..……...$750,000
FYs 2022–23 and 2023–24…….……..$500,000 per fiscal year

2. **Rubberized Asphalt Concrete (RAC) Technical Support and Research**
   The success of CalRecycle's RAC programs has been due in part to the technical support that has been provided through CalRecycle's RAC technical assistance contract and research efforts conducted by its university partners. CalRecycle is proposing to continue to provide technical support and research to address issues associated with roadway projects, including rubber hot-mix, rubber chip seal, rubber cape seals, and other emerging paving applications that have been determined by CalRecycle to have benefits derived from the use of scrap tire rubber. As shown in the activity funding below, funding for these efforts is proposed to vary from $550,000 to $650,000 per fiscal year. This will accommodate the award cycles for the contracts needed to support CalRecycle's Technical Support Contracts.

   - **RAC Technical Support**
     The technical assistance contractor will also assist CalRecycle with marketing and promoting the use of RAC. This will be accomplished through the development and distribution of technology transfer materials and presentation of these materials at key stakeholder workshops and conferences. The contractor provides technical assistance and training to RAC grantees to ensure that their projects are successful. To date, the contractor has conducted training sessions for over 300 local government entities.

In addition to providing technical assistance, the contractor may also assist CalRecycle in implementing regional application projects in which two or more eligible jurisdictions collaborate. Regional application projects can address obstacles to wider and continued sustainable use of RAC by local agencies. In addition, the contractor will provide training to each participating agency so that they can carry out future cooperative purchases on their own.

Through this program, the contractor will assist on agency projects and may provide design assistance, specification review, bidding and procurement, construction management, quality assurance, and quality control, as necessary.

- **RAC Research**
  Under this activity, CalRecycle will continue to conduct research of rubber paving applications in support of efforts to promote its use. Listed below are several RAC research proposals that CalRecycle is currently considering:
  - Performance Model development for rubberized paving applications (e.g., cape seals, slurry seals),
  - Rubberized Chip Seal Design Specifications,
  - Research in determining the rubber content in rubberized binders, and
  - Accelerated Pavement Testing of RHMA-G and RHMA-O Mixes Containing Recycled Asphalt Pavement

Activity Funding
FY 2019–20……..……...…….……....$550,000
FYs 2020–21 through 2023–24...…….……..$650,000 per fiscal year

3. **Caltrans PG+X Binder Project**
   Caltrans is continuing to meet with industry stakeholders to refine the PG+X binder proposal that would require the use of a small percentage of crumb rubber (5-10 percent) in all asphalt binder that is currently classified as unmodified. Caltrans has identified and prioritized research proposals that address potential issues that may hinder the implementation of their PG+X program. CalRecycle has partnered via a contract with Caltrans to assist in this research. The continued funding of this research will assist in the implementation of this program by Caltrans. CalRecycle may also address some of the research proposals via contract(s) with UC Davis Pavement Research Center (UCPRC).

Activity Funding
FYs 2019–20 through 2020–21…….. $350,000 per fiscal year

4. **Research on TDPs and Technologies Using Waste Tires**
   CalRecycle will continue to investigate TDPs and technologies that utilize waste tires to study and determine whether they are viable in the current tire market and if there are health and safety impacts that could adversely affect their use. Some of these applications may include identification of end-of-life options for various TDPs, including: turf applications and playgrounds; assessing the feasibility of using crumb rubber in molded, extruded, and other products; assessing market challenges and potential solutions for retread tires; assessing market opportunities for various TDPs; and research into innovative and emerging technologies such as devulcanization. Research may also be performed regarding changes in the composition of materials used to manufacture tires and the potential impacts of those changes on manufacturing TDPs. CalRecycle may also develop methodologies to quantify the greenhouse gas emissions associated with TDPs. To conduct this research, CalRecycle may partner with industry, universities, and other state agencies.

   Activity Funding
   FYs 2019–20 through 2023–24……. $250,000 per fiscal year

5. **Retread Tire Research**
   This activity proposes to perform research, analysis, or testing to identify issues and barriers and propose solutions to increase the use of retread truck and off-the-road tires. This may include: conducting a life cycle analysis; testing to determine tire tread life and rolling resistance; structural and chemical analysis related to suitability of new tires to be retreaded or recycled; and identification of barriers and solutions to increase use of retread tires in commercial and government fleets.

   Activity Funding
   FY 2019–20 …..……..……..…….$250,000

6. **Feedstock Conversion Assistance and Material Testing**
   This activity proposes to provide manufacturers necessary technical assistance and other services to support feedstock conversion (using recycled crumb rubber rather than virgin rubber and other materials). The contract may also provide marketing and material testing support for the Tire Incentive Program.

Activities may include, but are not limited to:

- Identifying prospective manufacturers and products suitable for feedstock conversion,
- Developing marketing information and conducting marketing outreach to prospective manufacturers,
- Securing interested manufacturers to participate in feedstock conversion activities,
- Developing individual manufacturer activity plans and associated budgets for feedstock conversion, and
- Qualifying processors to provide crumb rubber.

Additionally, the contract may provide for working with manufacturers and securing appropriate technical expertise to execute individual manufacturer activity plans for feedstock conversion and providing technical assistance and follow-up to ensure production and sale of the tire-derived products.

Marketing and material testing support for the Tire Incentive Program may include, but is not limited to:

- On-site sampling and laboratory testing of crumb rubber to ensure appropriate mesh size and particle distribution,
- Identifying contaminates, and
- Performing appropriate quality assurance and control checks.

Activity Funding

FY 2021–22.....$150,000
FY 2023–24.....$150,000

7. Tire-Derived Aggregate Grant Program

This program provides funding for civil engineering projects utilizing TDA to:

- Local governments, special districts, joint powers authorities;
- State agencies (including offices, departments, bureaus, and boards);
- California-based private, for-profit entities
- Non-profit organizations; and
- Qualifying California Indian tribes.

To be eligible for the grants, projects must use TDA in one of a variety of approved civil engineering applications.

Activity Funding
FYs 2019–20 through 2023–24…… $850,000 per fiscal year

8. **Rubberized Pavement Grant Program**
   This program will continue to be offered to cities, counties and qualifying California Indian tribes that fund public works projects located in California. The program is designed to help create long-term sustainable markets by focusing on first-time and limited-experience users of rubberized paving. This may include grants and incentives to further the purposes of the program. Funding for this program is reduced due to additional spending authority expiring after FY 2018–19.

   Activity Funding
   FY 2019–20……..……..$4,002,000
   FY 2020–21……..…..$4,387,000
   FY 2021–22……..……..…$3,787,000
   FY 2022–23……..……..…$5,187,000
   FY 2023–24……..……..…$4,037,000

9. **Tire-Derived Product Grant Program**
   This program and its predecessors have increased demand for TDPs, especially with local governments and school districts. It has also encouraged the appropriate substitution of recycled rubber for virgin rubber (also known as feedstock conversion). Typical TDPs include:
   - Landscaping and playground loose-fill mulch;
   - Playground tiles; and
   - Crumb rubber infill for all-weather sports surfacing, rubberized sidewalks and tree wells, floor and agricultural mats, and sports tracks.

   Activity Funding
   FYs 2019–20 through 2023–24 ……..…… $1,000,000 per fiscal year

10. **Tire Incentive Program**
    This successful and competitive incentive grant program is targeted at expanding demand for higher value-added products using crumb rubber from California-generated waste tires. Incentives may include, but are not limited to: new and existing tire-derived products, end-of-life material, feedstock conversion, and use of fine (≤50) mesh material.

Examples of possible eligible products include, but are not limited to:

- Flooring underlayment,
- Rubberized flooring,
- Conveyer belts,
- Calendared or compounded rubber,
- Agricultural harvesting devices,
- Landscaping and garden products,
- Building products,
- Traffic devices,
- Spacers,
- Fencing,
- Asphalt products (that are not eligible under other CalRecycle programs), and
- Paintings and coatings,

Asphalt products must contain a minimum of 5 percent crumb rubber in the binder or flux.

Activity Funding

FY 2019–20……..……..$3,500,000
FYs 2020–21 through 2023–24…...……$4,500,000 per fiscal year

11. Tire Outreach and Market Analysis

This program intends to document market trends and conduct focused technical outreach to public and private procurement entities to increase demand and expand the use of waste tire-derived material in a variety of applications including higher value-added products. CalRecycle staff and an independent contractor will provide:

- An annual in-depth survey and analysis of the waste tire and TDP markets in California and the associated *California Waste Tire Market Report*. This effort consists of a market analysis study to assess the market for California waste tires and influencing factors in the market, including providing information on the waste tire diversion rate, market trends, supply and demand balance and capacity, and other relevant market analyses. The analysis will culminate with the annual publication of the *California Waste Tire Market Report*.

- Focused technical outreach and education targeted at stakeholders such as federal, state, and local governments; school districts; and private entities that

are in a position to procure tire-derived products and have the authority to specify them in future projects. The goal of this effort is to increase demand for TDPs, foster the application of new technologies, and expand the use of waste tire-derived material into a variety of applications, including higher value-added products. This includes monitoring and measuring the outcome of these efforts; developing case studies; conducting meetings, trainings, and webinars to targeted stakeholders (including two CalRecycle tire conferences); and maintaining and updating outreach and education materials.

- Help identifying end-of-life best management practices and markets for synthetic turf, infill, playground fill, and other TDPs.

- Research and testing to address identified gaps in TDP product data and specifications that pose a barrier to TDP market expansion.

- Promotion and partial funding for a TDP design competition at the collegiate level. Competitors will help identify potential products, applications, and ventures that the existing industry may wish to pursue. The competition will also boost interest in TDP from emerging professionals in the design community. Submitted design materials and ideas will be used in ongoing Tire Outreach Marketing Analysis outreach and will expand the range of products and applications that rely on recycled tires.

Activity Funding
FYs 2019–20 through 2023–24……$350,000 per fiscal year

12. Tire Events

CalRecycle will continue to hold tire workshops, forums, and trainings, as it has in past years. These tire business and product events will provide attendees with up-to-date information about waste tire management programs. They provide a venue to discuss all aspects of waste tire management, including hauling, manifests, cleanup, proper disposal, recycling technologies, and research and market development activities. These events also offer a venue for staff and stakeholders to meet and focus on issues of common concern. Wherever possible, events will be conducted in conjunction with related events organized by organizations such as the League of California Cities, California Public Works Association, and California State Association of Counties. In addition, CalRecycle staff combined the tire and used oil/household hazardous waste annual conference and the Recycling Market

Development Zone conferences and training workshops into one combined three-year contract to provide efficiencies of scale and other benefits. All events will be coordinated with CalRecycle's Office of Public Affairs.

Activity Funding

FY 2019–20……..……...$75,000 per fiscal year
FYs 2020–21 through 2023–24……$100,000 per fiscal year

CalRecycle's Mexico/ California Border Waste Tire Activities and Support

Used tires are exported into Mexico as a commodity used in business operations, including but not limited to activities such as the sale of used tires from tire dealers. Used tires are transported to Mexico through border ports of entry. After tires have been reused and reach the end of their useful life, a portion of these reused tires end up as waste tires that are illegally disposed or improperly stored along the California-Mexico border. The waste tires that end up along the border are either dumped illegally or used for slope stabilization purposes in the border region. These waste tires then cause environmental problems in the California-Mexico border region, including in the Tijuana River estuary. These waste tires are from many sources, including new tires originally sold in Baja California and used tires imported as commodities into Baja California from California, Arizona, and other states and then subsequently discarded after use.

To date, many entities—Mexican and United States federal agencies, state and local agencies, and non-profit organizations—have tried to address this problem, with most efforts focused on cleanup and remediation of large legacy tire piles and of the Tijuana River estuarine area. CalRecycle's efforts in this regard, described below, entail enforcement support, hauler manifesting and compliance, cleanup, research, and technical assistance. CalRecycle continues to support the development of a tire management program in Mexico by providing technical assistance when needed. CalRecycle intends to build on these efforts in the years to come.

Based on more than 20 years of experience implementing tire-related management programs, CalRecycle believes a long-term solution to the problem of waste tire pollution along the California-Mexico border depends on strong bi-national collaboration. This collaboration should focus on building and sustaining a healthy institutional framework and associated financing mechanisms to implement key regulatory and market development functions similar to those seen in California and other states. These include facility permitting and oversight, hauler registration and compliance, enforcement, cleanup and remediation activities, as well as research and market development programs. Based on its previous work with the University of California, Berkeley on a model tire management framework for Baja California, CalRecycle understands that the Mexican federal and Baja California state governments have made significant progress in the last few years in establishing an overall statutory framework for tire management. CalRecycle welcomes the opportunity to provide technical

assistance to the government of Baja California as it engages in institutionalizing and financing a long-term management program.

At the same time, CalRecycle recognizes the need to better understand current used and waste tire flows in the border region and to collaborate with multiple stakeholders on identifying and prioritizing specific border projects where the use of tire funds may be most effective in contributing to long-term environmental protection in the region. Accordingly, CalRecycle contracted with San Diego State University Research Foundation to accomplish these objectives. Several workshops were conducted under the contract to discuss these issues. In April 2017, a workshop was held in Sacramento to discuss the challenges of waste tire disposal in Mexico. At this workshop nine stakeholders from Mexico attended, including staff from the Secretaría de Protección al Ambiente de Baja California. In August 2017, a workshop was held in San Diego to discuss solutions for waste tire disposal in Mexico. At this workshop ten stakeholders from Mexico attended, including staff from the Secretaría de Protección al Ambiente, Mexican Secretaría of the Economy, Association of Tire Dealers, Center for Innovation and Environmental Planning, and the National Chamber of Commerce, Services, and Tourism in Tijuana. In November 2017 a third workshop was held in Tijuana, Baja California where representatives from Mexico, California Environmental Protection Agency, and CalRecycle discussed waste tire regulations and compliance and the possible usage of rubberized asphalt concrete and tire derived aggregate. Thelma Castaneda Secretaría de Protección al Ambiente attended this workshop and afterwards created a list of next steps for Mexico. San Diego State University Research Foundation's final report is available in English and Spanish. The remainder of this appendix lists other activities that CalRecycle has engaged in or that are planned to address these serious, shared risks to health and safety and the environment.

Understanding that much of the waste tire pollution in the border region is severe and damaging to estuaries and rivers, CalRecycle will prioritize funding waste tire cleanup and tire amnesty events in t San Diego and Imperial Counties.

Waste Tire Enforcement Support Activities

California Highway Patrol (CHP) Enforcement Support Activities
CalRecycle continues to utilize its partnership with the CHP to carry out surveillance efforts in the California-Mexico border region. The CHP provides roadside checkpoints to assist CalRecycle with surveillance and enforcement support to monitor illegal activities related to tire exports through California ports in the California-Mexico border

region. The transportation of tires requires that tire hauling business be registered with the State of California, and, that haulers are in possession of a manifest documenting the amount, origin and destination of used and waste tires being hauled. Haulers not complying with those requirements are cited with violations. Between 2017 and 2018, CHP conducted four (4) checkpoints with CalRecycle in the border region. No violations were found during these checkpoints.

California Air Resources Board (CARB) Surveillance Assistance
CalRecycle continues its agreement with the CARB to support field investigations. CARB has extensive experience in assisting other agencies in the purchase, maintenance, monitoring, and use of both covert and overt surveillance equipment and real-time remote monitoring and sensing, which can help to deter or locate and prosecute those who are illegally hauling or disposing of tires along California border regions.

Training Support for Waste Tire Inspectors and Managers
CalRecycle offers a regular technical training series that includes sessions for waste tire inspectors and managers. Sessions include topics such as:

1) Inspection skills and investigative techniques for waste tire field inspectors;
2) Investigative techniques and how to involve other agencies in tire investigations and prosecution;
3) Tire evidence collection and case file preparation; and
4) Tire surveillance case study, which covers the above described CHP and CARB surveillance resources and further explains the effectiveness of those programs.

In November 2017, as a part of the workshop held in Tijuana, Baja California, CalRecycle enforcement staff presented about the waste tire system and enforcement program in California to representatives from Mexico and California Environmental Protection Agency.

Hauler Manifest and Compliance

The Tire Hauler Compliance Unit, which includes the waste tire hauler manifest system, continues to be successful in having Mexican tire haulers register with CalRecycle, who operate transport businesses of tires between the two countries on California roadways. All vehicles hauling 9 or more used or waste tires in California are required to be registered with the State. In 2017, there were 33 waste tire haulers from Mexico

registered with the Tire Hauler Program. In 2018, 29 waste tire haulers from Mexico registered with the program. The compliance unit has Spanish-speaking staff, allowing easier and more receptive communications with the Spanish-speaking regulated community. Additionally, the unit has a separate toll-free waste tire hotline for the Spanish-speaking regulated community. Between 2017 and 2018, CalRecycle held a total of 26 Spanish and English tire hauler trainings throughout the state; this included approximately 10 specifically in the California-Mexico border region and southern California areas.

Cleanup Activities

Large quantities of trash, tires, and sediment are transported by storm water from Mexico into the Tijuana River Valley and estuary, adversely impacting Border Field State Park south of San Diego and the Tijuana River National Estuarine Research Reserve. The Tijuana River Recovery Team is a consensus-based collaboration of more than 30 federal, state, and local government agencies; environmental and scientific community stakeholders; and funding agencies formed to address the broad range of issues affecting the watershed. To spearhead this effort, in 2010 CalRecycle developed and implemented a project with California State Parks to capture tires and solid waste currently discharged to Goat Canyon within Border Field State Park. The Goat Canyon cleanup project removed tires, trash, and sediment from the debris basin and installed a debris netting and capture system to collect tires and trash from Mexico and to prevent their discharge into the estuary. The project cost approximately $2 million and included a related consultant study to evaluate the nature and extent of trash, waste tires, and sediment in the Tijuana River Valley.

In September 2012, CalRecycle again approved funding for a CalRecycle-managed cleanup of the Border Field State Park illegal disposal site, Tijuana River Valley and Estuary, and the Goat Canyon trash capture and removal system cleanout. This project was completed in January 2013 at a cost of approximately $1 million. Refuse-laden sediment was removed from the basins and screened for future studies and use. The California Department of Parks and Recreation contributed $300,000 to the cleanup project.

In addition, CalRecycle implements three local government cleanup grant programs that include projects in the border region. During FY 2014–15, CalRecycle awarded $370,086 in Local Government Waste Tire Cleanup Program grants in the border region (Imperial County, San Diego County, and the City of San Diego), resulting in the cleanup of 51,193 waste tires. This represents approximately 22 percent of the total

cleanup grants awarded ($1,715,882) statewide. During FY 2016–17, CalRecycle awarded $421,547 in Tire Cleanup Program grants to the same border region (Imperial County, San Diego County, and City of San Diego), representing approximately 26 percent of the total cleanup grants awarded ($1,589,369) statewide and resulting in the cleanup of 43,915 tires. During FY 2018-19, CalRecycle awarded $311,810 in Tire Cleanup Program grants to the border region (Imperial County and City of San Diego), representing approximately 23 percent of the total cleanup grants awarded ($1,354,412) statewide. The actual number of tires collected for this grant cycle will be unknown until the cycle closes in September 2020.

In FY 2012–13, CalRecycle separated the Local Government Waste Tire Cleanup and Amnesty Grant Programs into two separate, two-year cycles. The programs were offered in alternating years, beginning with the Cleanup Program; therefore, CalRecycle did not award Waste Tire Amnesty Grants in FY 2012–13. For FY 2015–16, CalRecycle awarded $73,131 in Amnesty grants in the border region (Imperial and San Diego counties). This represents approximately 4 percent of the total amount of funds awarded for this grant cycle and resulted in the collection of 14, 976 tires. For FY 2017–18, CalRecycle awarded $92,869 for Amnesty grants, which resulted in 15,184 tires collected in the border region (Imperial and San Diego counties). This represents approximately 5 percent of the total amount of funds awarded for this grant cycle. CalRecycle will prioritize the outreach of Local Government Waste Tire Cleanup and Amnesty Grant Programs to San Diego and Imperial Counties.

During FY 2014–15, CalRecycle awarded $87,082 in Farm and Ranch Solid Waste Cleanup and Abatement Program grants in the border region (Imperial County), representing approximately 35 percent of the total amount of funds awarded for this grant cycle and resulting in the cleanup of 84 tires.

CalRecycle also administers the Local Conservation Corps Grant Program. A portion of the tire funding received through this grant program continues to be expended on waste tire removal in the border region. In FY 2016–17 and FY 2017–18, Local Conservation Corps of Southern California provided crews to assist with Tijuana River clean-up efforts. The Urban Corps of San Diego County, along with Conservation Corps Long Beach, Orange County Conservation Corps, and Los Angeles Conservation Corps collaborated on a 2-day waste tire cleanup that resulted in 1,700 tires collected. In FY 2017-18, Corps cleanup efforts collected over 3,000 waste tires. CalRecycle will continue to prioritize funding Corps cleanup efforts in San Diego and Imperial Counties, increasing the number of waste tires collected in the next fiscal year.

Research, Bi-National Collaboration, and Technical Assistance Activities

Study on the Flow of Used and Waste Tires between California and Mexico
Mexico imports used tires from California that have a very short life span. Many of these imported tires are illegally disposed of and cause environmental hazards. For example, tires illegally disposed in the Mexican border region have caused environmental issues in California: tires and other debris entering the Tijuana Estuary pollute the watershed and fires in Mexicali disperse toxic smoke into Calexico. The study completed in 2009 found that about 750,000 tires were taken across the border legally as used tires because there was a market in Mexico. An additional 75,000 tires were taken across the border illegally. The final report is available in Spanish and English. In December 2015, CalRecycle entered into a new contract to update the Border Tire Flow Study. The study found that in 2016 about 868,878 tires were taken across the border legally as used tires because there was still a market in Mexico. The study estimated that by 2017 the irregular flow of used tires taken across the border illegally had been reduced to 5 percent, which is down from 10 percent in 2009. The used tire market continues to exist in Mexico since a used tire costs between $17-$28 compared to a new tire that costs between $70-$258. The final report is available in Spanish and English.

Bi-National Program Participation
In the past, CalRecycle has collaborated with the Resource Conservation Challenge Border Group, California Biodiversity Council, Biodiversity Along the Border Committee, 2008 Border Governors Conference, and the Border 2012 Program. Currently, CalRecycle continues to participate with the Tijuana River Valley Recovery Team and looks forward to participating with the newly formed Border 2020 U.S.-Mexico Environmental Program to resolve the problems caused by illegally dumped waste tires along the border region.

The Border 2012 program (also known as the U.S.-Mexico Environmental Program) was a broad environmental collaborative with bi-national entities, coordinated by (and with funding from) the U.S. EPA. Important components of the Border 2012 program included community outreach, training, technical support, and cleanup of waste tire sites along the California-Mexico border. The program accomplished cleaning up of both the Innor and El Centinela scrap tire sites in Baja California, which contained a total of more than 1.25 million tires. These tires were shredded and used as fuel in various cement kilns in Mexico. To date, more than 6.8 million tires overall have been recovered in the

border region through the partnership. CalRecycle continues to collaborate with CalEPA and the Border 2020 program participants to help develop community outreach, additional training, technical support to Mexican tire haulers, and training for CHP commercial officers who work along the California-Mexico border.

Currently, CalRecycle participates in the Border Region Solid Waste Working Group (SWWG). The Solid Waste and Waste Tire Strategic Plan identifies the objectives of the SWWG in the development and coordination of solutions to remediate problems associated with waste tires, solid waste, and excessive sediment threatening water quality and public health in the California-Mexico border region.

Technical Assistance for Baja California's Development of Integrated Waste Tire Management Plan

In January 2011, CalRecycle entered into a contract with the University of California, Berkeley to provide technical assistance for a framework for cooperation among jurisdictions on both sides of the border to adequately address the continued illegal dumping of waste tires that cause problems in the border region. *Methodology for the Development of a Model Integrated Waste Tire Management Plan Framework for the State of Baja California* was published in November 2012 and is available in English and Spanish.

Sharing Environmental Education Materials in the Border Region

SB 772 (Ducheny, Chapter 214, Statutes of 2005) requires CalRecycle to work with Mexico in areas related to waste, used tires, environmental education, and training. In coordination with CalEPA and CalRecycle's Office of Education and the Environment, the tire program developed a mechanism with Mexico's Secretariat for Public Education, Baja California's Secretaría de Protección Ambeintal, and Baja California's Education System allowing for bi-national distribution of CalEPA's environmental education curriculum titled *Conservation and Pollution Prevention at a Shared Border* (Adams, Linda S., 2007). This elementary school curriculum includes lessons that are relevant to prevalent border conditions such as land, water, and air pollution, and is consistent with existing environmental education and training principles in Mexico. In 2007–08, English and Spanish versions of the curriculum were provided to 12,000 border area teachers, educators, and schools. This curriculum contains scientific and resource-based lessons regarding the border area, with key steps toward environmental sustainability.

Administrative Costs

Program Staffing

Tire-related activities are performed by a total of 68.3 positions within CalRecycle. The cost of staffing is approximately $7.8 million. Breakdown of positions are as follows:

Division or Office	Positions
Audits Office	1
Administration, Finance & Information Technology Services Division	3.2
Legal Affairs Office	3
Legislative & External Affairs Office	0.3
Materials Management and Local Assistance Division	22
Public Affairs Office	0.4
Waste Permitting, Compliance and Mitigation Division	38.4
Total Tire Positions within CalRecycle	**68.3**

Activity Funding

FYs 2019–20 through 2023–24……$7,843,000 per fiscal year*

*Staffing costs are estimates only, due to the unpredictability of costs for personnel services.

Administration

Administration refers to the accounting of central management costs, such as those pertaining to executive management, accounting, human resources, grants, business services, employee health and safety, small-office support, and statewide pro rata assessments. Pro rata is the sharing of central service costs (as mentioned in the State Administrative Manual, Section 8753) that generally serve all of CalRecycle (i.e., indirect or overhead costs) by funds other than the General Fund. Administration funding represents the distribution of these “indirect costs” to direct CalRecycle program activities that include the tire program.

Activity Funding

FYs 2019–20 through 2023–24..... $3,779,000 per fiscal year*

**Administrative costs are estimates only, due to the unpredictability of costs for personnel services.*

Mandatory Contracts

Mandatory contracts include allocations for the following:

- Attorney General's Office,
- California Department of Tax and Fee Administration,
- Department of Finance,
- Foundation for California Community Colleges,
- California Conservation Corps, and
- The Governor's Office of Planning and Research.

Activity Funding

FYs 2019–20 through 2023–24..... $1,392,000 per fiscal year*

**Estimate of costs for mandatory contracts.*

Appendix A: Accomplishments Based on Performance Measures from the Five-Year Plan

This section contains performance measures from the *Five-Year Plan for the Waste Tire Recycling Management Program* with accomplishments reported after each performance measure. Data collected is for Fiscal Year 2017–18, unless otherwise specified.

Enforcement and Regulations Relating to the Storage of Waste and Used Tires

The enforcement program will use the following measures to evaluate success in achieving its objectives:

1. **Inspections:**
    a. Inspect all active major and minor permitted facilities in California at least once every 12 months.

        As of January 15, 2019, there were 43 major and minor waste tire facilities in California. In the preceding 12 months, 40 (93 percent) were inspected at least once.

    b. Inspect all active registered and exempt haulers located in California at least once every 24 months.

        As of October 18, 2018, there were 1,597 registered and exempt waste tire haulers in California. In the preceding 24 months, 1,324 (82.9 percent) were inspected at least once.

    c. Inspect all active generators and end-use facilities located in California at least once every 36 months.

        As of December 18, 2018, there were 21,386 active generators in California. In the preceding 36 months, 18,761 (87.3 percent) were inspected at least once.

2. **Noncompliant Tire Businesses:**

   a. Take timely progressive enforcement actions on illegal, unpermitted waste tire facilities and report the numbers of illegal sites remediated through the enforcement program.

      For Calendar Year 2017, CalRecycle staff issued a total of 33 enforcement actions, which included: eight administrative complaints, four cleanup and abatement orders, and 21 hauler streamlined penalties.

      Furthermore, for Calendar Year 2018, CalRecycle staff issued 23 enforcement actions, which included: two administrative complaints, five cleanup and abatement orders, and 17 hauler streamlined penalties.

3. **Grant Program:**

   a. Provide training to TEA grantee inspectors.

      CalRecycle conducted four (4) grantee roundtable meetings in the spring of 2018. Subjects included introduction of new section supervisors, inspection and enforcement procedures, tire enforcement legal issues, general grant management and administration topics, and surveillance resource options.

      CalRecycle conducted the 17th Technical Training Series in Long Beach, California in April 2017 and just completed the 18th Technical Training Series held in December 2018 in Monterey, California. CalRecycle also conducted two Grant Management System training webinars for all TEA inspectors and grant related staff during October 2017 and September 2018, to review grant requirements.

      Additionally, after CalRecycle trained all TEA inspectors in the program in June 2016, CalRecycle continues to train and approve individual TEA inspectors as they participate in program. The training includes a review of a webinar training recording, a review of waste tire regulations, an in-office training session, and joint TEA/ CalRecycle field inspections prior to final approval by CalRecycle.

b. Report on TEA grantee performance starting July 1, 2018.

   CalRecycle has begun developing TEA performance measurement criteria and procedures. TEA grantee performance pilot monitoring began with the TEA 23 (FY 17-18) grant cycle.

Hauler and Manifest Program

The Hauler and Manifest Program will use the following measures to evaluate success in achieving its objectives:

1. Reduce the number of registered waste tire haulers that do not submit manifests to no more than 5 percent of the active tire haulers by December 2018.

   Of the 1,358 active waste tire haulers, 57 haulers failed to submit waste tire manifests by December 31, 2017, which is approximately 4.1 percent.

2. Reduce the percentage of active tire haulers whose manifest form error rate is greater than 10 percent by December 2018.

   During the period January 1, 2017 to December 31, 2017, there were 461 active waste tire haulers that had more than a 10 percent error rate on the manifest forms they submitted to CalRecycle, which equates to approximately 27 percent of the total active tire haulers submitting manifest forms. For purposes of this evaluation, CalRecycle is only looking at those haulers who submit 100 or more forms in a year.

3. Track the percentage of waste tire enforcement program cases for which the manifest system information has been used to assist CalRecycle staff and local enforcement agencies and report annually.

   In calendar year 2017, 30 out of 33 enforcement actions issued by CalRecycle staff were Hauler and Manifest Program related. Furthermore, 19 of those 30 actions were related to manifest errors or omissions, The Hauler and Manifest Program enforcement actions for calendar year 2017 include:

   - 8 administrative complaints (6 hauler related and 2 manifest related);
   - 1 cleanup and abatement order at a registered hauler location; and
   - 21 hauler streamlined penalties (4 hauler related, 16 manifest related, and 1 hauler/manifest related).

For calendar year 2018, 18 out of 23 enforcement actions issued by CalRecycle staff were Hauler and Manifest Program related. Furthermore, 8 of those 18 actions were related to manifest errors or omissions. The Hauler and Manifest Program enforcement actions for calendar year 2018 include; 1 cleanup and abatement order at a registered hauler location and 17 hauler streamlined penalties (9 hauler related, and 8 manifest related). There was one Hauler and Manifest Program administrative complaint issued during this period.

In the Hauler and Manifest Program, all (100 percent) enforcement actions utilize manifest information to assist with enforcement investigations and cases, and this data continues to demonstrate the importance of the manifest system in providing data to support the majority of CalRecycle's enforcement cases.

4. Track the number of "204 Form" entries for which the end-use facility operators are required to report both unregistered waste tire haulers transporting tires to their facilities and complaint forms received.

For the period July 1, 2016 to June 30, 2017, there were 525 complaint forms received. These complaint forms include:

- "204 Form" from solid waste disposal sites documenting unregistered hauling vehicles hauling more than 10 tires;
- Hauler observation forms reporting waste tire haulers that may be violating waste tire hauler and manifesting requirements; and
- Waste tire complaints received from the public.

5. Track the number of penalties levied for violations of the PRC pertaining to waste and used tire hauling and report annually.

During the period of July 1, 2016 to June 30, 2017, there were 38 enforcement cases resolved against tire haulers resulting in assessed penalties of $180,340 along with $320,000 in penalties held in abeyance pending offenders' future satisfactory compliance with waste tire laws and regulations.

6. Determine the quantity of waste or used tires being picked up or delivered each year in California by December 2018.

During the period January 2015 through December 2017, there was a yearly average of 64,740,773 waste or used tires picked up and 69,415,729 waste or used

tires delivered. This is an increase (6.1 million and 8.0 million, respectively) from the previous years (2014-2016), which showed an annual average of 58,562,306 waste and used tires picked up and 61,387,666 waste and used tires delivered. Figures for the years 2015 and 2016 were revised from the last report after a database query error was identified, which explains the perceived sharp increase in numbers from the prior reporting period.

Chart 1: Pickups and Deliveries of Waste and Used Tires within California

Year	Pickups in CA (PTEs)	Deliveries in CA (PTEs)
2015	63,709,051	65,730,147
2016	65,251,918	70,249,213
2017	65,261,352	72,267,826

Cleanup Program

The cleanup program will use the following measures to evaluate success in achieving its objectives:

1. Complete the short-term waste tire remediation projects referred by the Enforcement Program in a timely manner and report status of projects to CalRecycle on an annual basis.

   In the fall of 2017, the Sonoma area wildfires burned tires used for erosion control in the flowline of a creek on a private property near Lakeville Highway and Highway 39. As part of the Federal Emergency Declaration, U.S. EPA Region IX emergency response crews responded to extinguish the burning tires by excavating and removing burned and partially burned tires into a stockpile and then stabilizing the slopes of the creek. The U.S. EPA requested assistance from CalRecycle to remove and dispose of the tires. CalRecycle mobilized to coordinate efforts with U.S. EPA and complete the site restoration, which included the loading and disposal of stockpiled tires, and the installed erosion control measures in areas of disturbed ground.

2. Increase the number of tires collected and remediated through Farm and Ranch Cleanup, Tire Cleanup, Tire Amnesty, and Local Conservation Corps grants by 10 percent annually.

   Staff will continue to increase outreach to the tribal community and build awareness about available Farm and Ranch grants. Beginning FY 2013–14, ranking criteria for

the Local Government Waste Tire Amnesty grants was revised to award a higher rank to applicants who work with Local Conservation Corps. The Corps provides staff resources to promote and collect at the amnesty events, which would increase the number of tires collected from the public. In FY 2016–17, ranking criteria for the Local Government Waste Tire Cleanup grants was revised in a similar manner for applicants who work with the Local Conservation Corps. The Corps provides additional staff resources to collect tires. With increased awareness about the Corps' ability to conduct tire cleanup activities, the number of applicants and tires could increase. Chart 2 lists the grant programs, the number of tires collected, and the percent change between fiscal years.

Additional data on the Local Conservation Corps grant cycles for FYs 2014–15 and 2015–16 can be found in the final summary reports.

Chart 2: Waste Tires collected by Grant Program and Percent Change

Grant Program	FY 2014–15	FY 2015–16	Percent Change	FY 2016–17	Percent Change	FY 2017–18	Percent Change
Farm and Ranch Solid Waste Cleanup and Abatement	7,052	11,789	67%	2,367	-80%%	97*	52%
Local Government Waste Tire Amnesty	**	402,744		**		*	
Local Government Waste Tire Cleanup	241,754	**		261,560	8%	**	
Local Conservation Corps	15,294	72,584	375%	83,608	15%	104,974*	26%

*Open grants. Additional tire collection expected.

**No amnesty/cleanup grants awarded this fiscal year.

Note: Reduced funding for the Local Government Waste Tire Amnesty and Cleanup grant programs will likely reduce the number of grants and waste tires collected.

3. Increase the number of tires collected and remediated in San Diego and Imperial County.

During FY 2017–18, CalRecycle's grant programs reported the collection of 20,705 tires in San Diego and Imperial Counties.

Research Directed at Promoting and Developing Alternatives to the Landfill Disposal of Tires; Market Development and New Technology Activities for Waste and Used Tires

The market development program will use the following measures to evaluate success in achieving its objectives:

1. Increase the amount of waste tires recycled to 75 percent by 2020.

CalRecycle is focused on implementing programs to achieve a statewide 75 percent recycling (as opposed to diversion) goal for all discarded materials, as outlined under AB 341 (Chesbro, Chapter 476, Statutes of 2011). Consequently, the department is focusing mainly on recycling tires through reuse, civil engineering applications, and crumb rubber, as opposed to diversion through export, alternative daily cover (ADC), or tire-derived fuel (TDF). Based on this definition, the 2017 waste tire recycling rate is estimated at 33.3 percent, less than the 2016 rate of 34.4 percent and significantly down from the 2012 recycling rate of 44.3 percent.

2. Conduct research to address critical barriers to increasing markets for waste tire products and technologies (e.g., RAC PG+5 issues, turf field health, and environmental impacts) and incorporate research findings in education, marketing, and outreach materials to continue to promote these applications.

CalRecycle continues to make significant progress in promoting rubber paving applications such as rubberized hot-mix and rubber chip seals. As a result, these uses continue to increase statewide. Research has played a key role in CalRecycle's efforts to increase the use of rubber paving applications. These research efforts include:

- Investigation of the use of rubberized and non-rubberized recycled asphalt pavement (RAP) into new rubberized asphalt concrete (RAC),
- The effectiveness of warm mix additives in rubberized pavements,
- Life cycle cost analysis, and
- The development of rubberized hot-mix and chip seal performance models for pavement management systems.

CalRecycle's research efforts have also included support of the Caltrans Performance Grade (PG) +X proposal. CalRecycle is continuing to collaborate with Caltrans on a series of research proposals which will address barriers to implementation of PG+X and significantly increase the use of crumb rubber.

Research efforts have also enabled CalRecycle to make significant progress in the development of several long-term sustainable markets for TDA. These research efforts include the use of TDA as a vibration mitigation material in light rail applications, a lightweight fill material for embankment and landslide repair, civil engineering applications for use at landfills, a gravel replacement in on-site wastewater treatment (OSWT) systems, and as media for low-impact development infiltration galleries.

Additionally, research resources are used to answer questions from the public or address issues with current technologies. These issues, while minor, are pivotal in the promotion and continued use of TDPs.

The Feedstock Conversion Technical Assistance and Material Testing Services contract has enabled several manufactures to produce products with crumb rubber that were previously produced with virgin rubber and/or other materials. Products included: underlayment, pipe couplings, sidewalk repair components, and building waterproofing membranes. This research and technical assistance also enabled end-of-life crumb rubber to be recycled from an all-weather sports field into an engineered intermixed base layer for a replacement field. Additional research and assistance are anticipated to be provided in the coming years.

The results of CalRecycle's research projects validated the benefits of using tire derived products and technologies, which could ultimately increase diversion of waste tires from California landfills. CalRecycle uses this research in the department's outreach efforts, including marketing and education materials.

4. Increase the amount of waste tire material used in priority market segments, including RAC, molded and extruded products, and civil engineering (transportation).

According to the 2017 California Waste Tire Market Report:

- RAC and other paving material derived from waste tires increased 5-15 percent from 2015 to 2017,
- Molded and extruded products increased 5-15 percent, and
- Civil engineering applications decreased from 1.2 million PTEs in 2015 to 0.6 million PTEs in 2017.

To increase waste tire usage, CalRecycle offers TDA, rubber pavement, and tire-derived products grant programs along with a tire incentive program.

CalRecycle continues to address the lack of familiarity of use of waste tires in civil engineering applications, specifically RAC and TDA, by increasing outreach efforts through more focused technology exchange and outreach to local and state governments, contractors, and engineers in projects for which these technologies are viable. CalRecycle's past outreach efforts have resulted in the construction and design of numerous TDA projects, including expansion of the Bay Area Regional Transit (BART) and the integration of new rubber paving technologies such as warm mix into CalRecycle's Rubberized Pavement grant program, and the introduction of low-impact infiltration galleries. The success of these projects demonstrates that technical challenges and environmental concerns can be overcome to create long-term sustainable markets for both RAC and TDA.

Higher value-added products continue to be a focused area for CalRecycle. To assist in expanding this segment, CalRecycle pursues a three-point strategy.

- First, the Tire Outreach and Market Analysis (TOMA) contract increases the exposure of tire-derived products among industry professionals like architects and purchasing managers. Various "lunch and learn" opportunities are offered for architects and purchasing managers who work for local governments and school district officials.

- Second, CalRecycle provides Tire-Derived Product grants to local governments and school districts to offset the cost of purchasing tire-derived products. The intention is that once local governments and school districts gain experience with a TDP, they will purchase additional TDPs based on product performance and not rely on a grant.

- Third, the Tire Incentive Program (TIP) supports higher value-added products. The TIP provides an incentive to manufacturers to produce and sell products using crumb rubber (including fine $\leq$ 50 mesh, devulcanized, and end-of-life materials), which may be combined with other materials. This innovative effort is enhanced by a contract to provide technical assistance to manufacturers to produce products with crumb rubber or to increase the percent of crumb rubber used.

5. Support the increase in waste tire processing capacity to facilitate the 75 percent recycling goal.

   Expanding capacity is a demand-driven decision for businesses. CalRecycle is actively working to expand the demand for products made with tire-derived materials. CalRecycle is accomplishing this by providing financial assistance through various market development grants, providing technical assistance, and performing market-based research. CalRecycle works with existing waste tire processors that have made the business decision to expand their existing capacity or establish an additional facility at a different location. CalRecycle also works with individuals seeking to start a new waste tire processing facility. Financial assistance is available from the recycling Market Development Zone Loan Program.

5. Complete and report on the Recycled Tire Rubber in Turf Fields Research Contract with the Office of Environmental Health Hazard Assessment.

   OEHHA has contracted with Lawrence Berkeley Laboratories to test all of the samples of synthetic turf and crumb rubber collected and has held two scientific advisory panel meetings to discuss the study design and solicit recommendations from a panel of experts in statistics, toxicology, biomonitoring, and other fields related to the study. OEHHA collected samples from 33 fields around the state and is currently analyzing the samples for metals, volatile organic compounds, and other chemicals to develop a model to assess human health impacts. The final report will be available in late 2019.