

## **Video Transcript: An introduction to Tire Derived Aggregate (TDA)**

### **Title: TDA. Tire Derived Aggregate. A cost saving, sustainable, resource material**

Narrator (off camera): Our earth is fragile and must be cared for. What would happen if California's consumption levels required the resources from five earths? Yes, five earths. This is the amount of resources our state would require to sustainably survive at its current levels of growth and development.

We are not that far away from this happening...closer than most people think. Our resources are limited to one earth and we need to be mindful of this along with decreasing our carbon footprint. To reduce this footprint, we must rely more on sustainable, reusable resources for the many construction projects in our towns and cities.

Over forty million tires are discarded and replaced each year in California alone. Millions still end up in landfills or abandoned in streams and remote areas. These waste tires are a threat to the health and safety of our citizens, creating vector hazards and potential health risks if they burn.

Tire Derived Aggregate, more commonly called TDA, is a valuable, recycled, and sustainable resource made from waste tires. There are a number of TDA distribution sites in California. Here, very large semi-truck trailers, often called "walking floors", are utilized to transport this lightweight fill to construction sites.

Since TDA is lightweight it can be transported at one-third the cost. It is also a very durable material which is not biodegradable, and maintains its engineering properties over time.

In California, the TDA program is administered by CalRecycle, which combines research, education and market development to help promote the effective use of this recycled waste tire product. As part of these efforts, the agency has conducted numerous large-scale research projects to prove that TDA is an innovative resource, which is both safe and reliable.

CalRecycle offers grants to help state agencies, municipalities and private construction companies get their civil engineering projects off the ground. We have provided millions of dollars of funding for a variety of projects that each used over five hundred tons of TDA.

CalRecycle has a committed staff that can assist in the planning and development of your engineering projects which utilize Tire Derived Aggregate.

Every automobile and truck tire on the road is a resource. A significant number are turned into Tire Derived Aggregate and these small pieces of rubber tire have many incredible uses in a variety of civil engineering applications.

TDA is extremely effective for roadway repair. In Sonoma County a mountain road has washed away every ten years due to landslides caused by thousands of gallons of water running through a nearby ravine. The 2008 construction project left the roadway secure, thanks to the effectiveness of this lightweight, permeable, free draining aggregate. Today, this essential county road can more than adequately handle the mountain's extensive water runoff. TDA was responsible for bringing the cost of repairs in at fifty percent of the county's estimated budget for the project.

Malcolm Dougherty, Director, California Department of Transportation: “By using the TDAs we have been able to solve an engineering problem and also save taxpayers dollars. I think it is also a huge advantage for Caltrans and we are very excited moving forward in using TDA material in the future, because it is always good to use, used-up tires before they go to the landfill.”

Narrator (off camera): In Santa Barbara County TDA was used to repair Palomino Road. The thoroughfare has a long history of slides and closures, and was frequently blocked to traffic. Using this lightweight and highly permeable aggregate was a great cost benefit, especially since the Board of Supervisors did not have to acquire new land or obtain any easements. Also, the road remained open to all traffic during the repair process. Engineers estimate that the TDA repair will last four times longer than normal roadway fill materials.

William C. Tracy, Geologist, Public Works Department, County of Santa Barbara, CA: “It is gonna to increase the life of the road three to four times we would think, so, we’re hoping for thirty five to fifty years of life on this road using recycled tires.”

Narrator (off camera): Another beneficial property of TDA is its permeability. This lightweight highly permeable fill material is used to help capture harmful greenhouse gases from municipal landfills. This landfill gas can then be used by the landfill operators to power their large electric generators. These systems can produce thousands of Kilowatts of electricity per hour that can then be sold back to a local power company’s grid. Leachate gas removal systems can save cities and counties hundreds of thousands of dollars each year and help reduce the carbon footprint of that landfill.

Tim Israel, Senior Engineer, Sacramento County, Department of Waste Management: “At the Kiefer Landfill we utilize TDA in horizontal collectors for landfill gas. Methane is a green house gas; it is the by-product of the decomposition of garbage. We effectively utilize TDA in our collection system to extract this methane gas and turn it into green fuel which runs our generators. By doing this we have created approximately six million dollars a year in revenue.”

Narrator (off camera): TDA’s light weight produces only half the normal pressure against the sides of retaining walls and bridge abutments compared to traditional road fill materials. This is a cost benefit because it allows for the reduction in the amount of reinforce steel and concrete needed for many of these engineering applications.

TDA’s permeable and free draining characteristic also makes it an excellent choice for landslide areas and storm water drainage systems.

Light rail commuter trains often transmit low, noisy vibrations as they pass by homes and businesses. CalRecycle has researched the value of using TDA to lessen the vibrations caused by these trains. This sound mitigation is inexpensively achieved by using only twelve inches of Tire Derived Aggregate under the light rail tracks, which reduces ground-born vibrations to the surrounding areas.

TDA material can perform better than “Floating Concrete Slab” vibration mitigation and is fifteen times more cost effective, which has saved BART, LA Metro and VTA millions of dollars.

Mark S. Robinson, Chief Engineer and Construction Officer, Valley Transportation Authority (VTA): “We installed over three thousand linear feet of TDA track way and the net effect of that was over a million dollars in savings on our project.”

Narrator (off camera): Today in a number of California communities light rail trains travel through bedroom communities early in the morning and late at night, very, very quietly.

CalRecycle has partnered with UC Davis and UC San Diego to evaluate the effectiveness of TDA as a fill during earthquakes. This extensive research project has shown that TDA can withstand a jolt much greater than the 1989 Loma Prieta quake. TDA also possess superior stress capabilities compared to standard fill materials. BART understands the importance of this data and now uses TDA for earthquake protection underneath their tracks near a major fault line in Fremont, California.

Paul Medved, Project Manager, Bay Area Rapid Transit (BART): "Everything in our design, our track form, has to be flexible and accommodate that. TDA offers a uniquely flexible track form that will deal with all this constant movement, without requiring maintenance activity."

Narrator (off camera): City and County officials as well as civil engineers throughout the state are taking notice of TDA's effectiveness, when it is used in these applications.

Salud Carbajal, First District Supervisor, County of Santa Barbara, CA: "Well, I think CalRecycle provides the innovation the research and the resources to make these types of solutions possible."

Mark S. Robinson, Chief Engineer & Construction Officer, Valley Transportation Authority (VTA): "TDA has been very successful in every way we've looked at it... helped me achieve my schedule. It kept costs within my budget, this is a winner and we'll be using it on future extensions."

Joaquin Wright, Environmental Resource Engineer, TDA Specialist: "This use of recycled material is a great benefit to our environment, not only are we reducing the carbon footprint by using this material but we're also limiting the use of natural resources."

Stacey M. Patenaude, Materials Recycling Engineer, STAR Division, CalRecycle: "I worked for thirteen years to promote civil engineering applications for Tire Derived Aggregate. I am proud of the progress the state has made in developing the market and developing new applications that had never been thought of before to truly find an environmentally cost effective reuse for very problem material."

Narrator (off camera): CalRecycle's Tire Derived Aggregate program offers an environmentally safe, cost effective, recycled resource. In its own small way, TDA can help contribute to the health and well-being of our earth.

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