Date of Hearing: April 17, 2023

ASSEMBLY COMMITTEE ON TRANSPORTATION
Laura Friedman, Chair
AB 1250 (Friedman) – As Amended March 16, 2023

SUBJECT: Department of Transportation: low-carbon materials

SUMMARY: Requires the Secretary of Transportation (CalSTA), in consultation with the Director of the California Department of Transportation (Caltrans), to submit a report to the Legislature that discusses the carbon emissions associated with materials currently used in state transportation projects, alternative materials with lower carbon emissions, and benchmarks for using materials with lower carbon materials. Specifically, **this bill**:

1) Requires the report to be submitted to the Legislature on or before December 31, 2024

2) Requires the report to include the following:

    a) The carbon emissions associated with the materials currently used in state transportation projects.

    b) Alternative materials commercially available with lower carbon emissions.

    c) The durability, safety, and maintenance requirements of the lower carbon materials compared to those in current use.

    d) Benchmarks for adopting a low-carbon standard for materials used in state transportation projects.

    e) The estimated carbon emissions reduction that would result from using the low-carbon alternatives.

3) Requires, on or before December 31, 2025, and each year thereafter, Caltrans to report to the Legislature on Caltrans' progress on meeting the benchmarks for using materials with lower carbon emissions.

EXISTING LAW:

1) Establishes Caltrans and provides that the department has full possession and control of all state highways and property and rights in property acquired for state highway purposes. (Streets and Highways Code (SHC) 90)

2) Requires Caltrans improve and maintain the state highways, including all traversable highways which have been adopted or designated as state highways by the commission. (SHC 91)

3) Establishes Caltrans within CalSTA. (Government Code Section (GOV) 14001)

4) Establishes that recycling of natural resources is in the best interest of the state, and that facilitating recycling of concrete materials in concrete production reduces waste, truck trips, and emissions, while advancing sustainable practices in concrete manufacture. (Public Resources Code (PRC) 16000)

5) Requires Caltrans to review and modify bid specifications relating to the purchase of paving materials using recycled materials. (PRC 42700)

6) Authorizes Caltrans to establish specifications for the use of reclaimed asphalt pavement of up to 40% for hot mix asphalt mixes. (PRC 42704)

7) Requires Caltrans and local agencies to use advanced technologies and material recycling techniques that reduce the cost of maintaining and rehabilitating streets and highways and that exhibit reduced levels of greenhouse gas emissions through material choice and construction method. (PRC 42704.6)

FISCAL EFFECT: Unknown

COMMENTS: In California, there are approximately 350,000 miles of roads, 87% of which local governments such as cities and counties operate and maintain. Extensive design, engineering, and analysis goes into determining which types of materials to use in pavement. In 2017, Caltrans projects used more than 1 million cubic yards of concrete, which involved approximately 325,000 tons of Portland cement, more than 4 million tons of hot mix asphalt, and 1 million cubic yard of aggregate.

According to a recent study produced by the World Economic Forum, concrete is the second most widely used material on Earth, behind only water. But concrete has also historically been detrimental to the environment. According to a study published in 2019, the combination of the calcination during the making of concrete, which in many locations uses coal or natural gas as the primary heat source, as well as the transportation of concrete, are major reasons why concrete contributes upwards of 7% of global greenhouse gas emissions (GHG) globally per year.

Concrete's main binding ingredient, Portland cement, is a leading source of carbon dioxide pollution in concrete production. Nearly one-third of all concrete used for construction in the United States (U.S.) is procured by state and local governments. As major purchasers of concrete, state and local governments have an important role to play in accelerating sector-wide embodied carbon reduction through their procurement choices. A growing number of states and localities are focusing greater attention on concrete and its use in public projects as an element within broader climate policy and strategy.

Recycled materials benefits: According to the Department of Resources Recycling and Recovery (CalRecycle) construction and demolition materials make up approximately 29% of California's disposed waste stream, or approximately 11.6 million tons. Asphalt and concrete represent over 977,000 tons of disposal, or around 2.4%. This material, produced through road rehabilitation, maintenance, and demolition, is itself a source of recycled aggregate that can serve as new road base and subbase, the weight-bearing foundations of a road.

Aggregate consists of hard, graduated fragments of inert mineral materials, including sand, gravel, crushed stone, slag, rock dust, or powder; inert solid waste is concrete, asphalt, dirt, brick, and other rubble. Recycled aggregate is produced by crushing concrete, and sometimes asphalt, to reclaim the aggregate. Asphalt refers to the bituminous substance used to bind aggregate together to make asphalt concrete (AC). Reclaimed asphalt pavement (RAP) is used AC pavement that has been processed. Recycled asphalt concrete is the product of mixing RAP with new aggregates, asphalt and/or recycling agent. A recycling agent is used to soften and rejuvenate the existing asphalt pavement.

According to Caltrans' Greenhouse Gas Emissions and Mitigation Report 2020, the most promising additional GHG reduction opportunity for Caltrans for asphalt pavements appears to be a greater use of RAP. For concrete pavements, the greatest additional GHG reduction opportunity appears to be greater use of supplemental cementitious materials. However, the net effect of different pavement options is complex and often dependent on the project context. For example, RAP may not be advantageous if the recycled material is not locally sourced.

The National Asphalt Paving Association notes that use of RAP reduced carbon dioxide (CO_2) emissions by 2.4 million metric tons in 2019 nationwide. The National Center for Asphalt Technology reports that RAP at 25% of the asphalt mix reduces CO_2 emissions by 10-11% and RAP at 40% reduces CO_2 emissions by 16-18%, compared to use of virgin materials. A U.S. EPA study on asphalt shingles in pavement found a 6-14% reduction of CO_2, when reclaimed asphalt shingles are added to an asphalt mix, depending on different proportions. A study conducted by Climate Earth on the Environmental Impacts of Recycled Plastic Concrete shows that recycling plastic concrete results in a 15.3% reduction in carbon footprint and 16.2% reduction in embodied energy.

Current use of recycled material. Per existing law, Caltrans must work with CalRecycle to review and modify bid specifications relating to the purchase of paving materials using recycled materials. The major product categories with current or potential recycled-content products (RCP) markets in Caltrans projects are: road base, asphalt pavement, rubberized asphalt, plastic lumber bridge timbers and pilings, plastic lumber guardrail offset blocks, plastic lumber sign posts, glass in pavement delineation, sound walls, landscaping and erosion control.

Existing statute also requires Caltrans and cities and counties to use advanced technologies and material recycling techniques where possible and cost effective when maintaining and rehabilitating the streets and highways.

A recent report finds that 88% of the cities and counties in California reported using some form of sustainable pavement practices and was cited as, "very encouraging, particularly when one considers the potential cost savings involved," and "is clearly evidence of local agencies using newer technologies to stretch the dollar." The overwhelming majority also indicated that they will continue to use some form of sustainable strategy in the future.

More to ask. While much is currently required of, and implemented in, state and local governments for the use of recycled materials in transportation projects, this bill requires state transportation officials to submit a report to the Legislature that discusses the carbon emissions associated with materials currently used in state transportation projects, alternative materials with lower carbon emissions, and benchmarks for using materials with lower carbon materials, including benchmarks and durability of alterative materials.

While a review of current practices and benchmarks on low-carbon alternatives in transportation projects may be helpful, the author may wish to clarify the types of transportation projects, and suggested alternative materials for the transportation agencies to review.

It should be noted the author has a related bill this legislative session which requires Caltrans to utilize various asphalt recycling methods for a set amount of projects.

*According to the author, "*The California state Transportation Agency is one of the leading purchasers of concrete in the U.S. Due to its good mechanical and physical properties, concrete is one of the most important construction materials for buildings, roads, tunnels, bridges, foundations, dams and many other kinds of structures. Concrete contains cement as a binding agent, however, and the production of cement is responsible for large amounts of CO2 emissions, making it a major contributor to climate change. As concrete will continue to play an important role in the purchases by the state Transportation Agency in the future, it is imperative the Transportation Agency begin to collect the data necessary to pivot to more climate-friendly materials, such as low carbon concrete."

Previous legislation. SB 778 (Becker of 2022) would have added concrete to the Buy Clean California Act (BCCA), requiring a successful project bidder to provide the global warming potential of each concrete product used. This bill also requires the Department of General Services (DGS), in consultation with the State Air Resources Board (CARB), to establish and publish the global warming potential (GWP) benchmarks for classes of concrete in order to require, by Jan 1, 2025, awarding authorities to set acceptable levels of CO2e for projects.

AB 2953 (Salas), Chapter 872, Statutes of 2022 requires local agencies, as defined, to apply standard specifications for the use of recycled materials in streets and highways that are at or above the level allowed in the Caltrans specifications, to the extent feasible and cost effective, as specified.

AB 1035 (Salas of 2021) would have required Caltrans, cities, and counties that have jurisdiction over a street or highway to apply standard specifications that allow for the use of recycled materials when feasible and cost effective.

SB 1227 (Skinner of 2020) would have required cities and counties to allow the use of recycled materials in road maintenance and rehabilitation in order to be eligible for SB 1 funds.

SB 1238 (Hueso of 2020) would have required Caltrans to conduct a study to assess the feasibility, cost effectiveness, and life-cycle environmental benefits of including recycled plastics in asphalt used as paving materials, and, depending on the findings, authorizes Caltrans to develop specifications for the use of recycled plastics in asphalt.

SB 1 (Beall), Chapter 5, Statutes of 2017 increases several taxes and fees to raise the equivalent of roughly $52.4 billion over ten years in new transportation revenues and makes adjustments for inflation every year; directs the funding to be used towards deferred maintenance on the state highways and local streets and roads, and to improve the state's trade corridors, transit, and active transportation facilities

AB 2355 (Levine), Chapter 609, Statutes of 2014 requires by January 1, 2017, local agencies to adopt Caltrans standards on the use of recycled materials or to discuss why the standards are not being adopted at a public hearing.

AB 812 (Ma), Chapter 230, Statutes of 2012 authorizes Caltrans to establish specifications for the use of up to 40% reclaimed asphalt pavement for hot asphalt mixes on or before January 1, 2014.

AB 341 (Chesbro), Chapter 476, Statutes of 2011 establishes a state policy goal that 75% of solid waste generated be diverted from landfill disposal by 2020; requires a commercial waste generator to arrange for recycling services; and, requires local governments to implement commercial solid waste recycling programs designed to divert solid waste from businesses.

SB 1016 (Wiggins), Chapter 343, Statutes of 2008 requires that state agencies track how much waste they generate, and establish a target for recycling or diverting waste.

SB 420 (Simitian), Chapter 392, Statutes of 2006 expands the application of recycled-content requirements for road paving projects to all paving construction and repair projects.

AB 338 (Levine), Chapter 709, Statutes of 2005 requires Caltrans to make use of a specific weight of crumb rubber per metric ton of the total amount of asphalt paving materials it uses each year.

AB 574 (Wolk), Chapter 693, Statutes of 2005 encourages the use of recycled concrete. Defines "recycled concrete," authorizes recycled concrete to be used if a user has been informed the concrete may contain recycled materials, and prohibits recycled concrete from being sold to Caltrans or the Department of General Services only when specifically requested by the department.

AB 939 (Sher), Chapter 1095, Statutes of 1989 mandates a reduction of waste being disposed: jurisdictions were required to meet diversion goals of 25% by 1995 and 50% by the year 2000. Establishes an integrated framework for program implementation, solid waste planning, and solid waste facility and landfill compliance.

REGISTERED SUPPORT / OPPOSITION:

Support

None on file

Opposition

None on file

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