Date of Hearing: April 12, 2021

ASSEMBLY COMMITTEE ON TRANSPORTATION
Laura Friedman, Chair
AB 1035 (Salas) – As Amended April 5, 2021

SUBJECT: Department of Transportation and local agencies: streets and highways: recycled materials.

SUMMARY: Requires the Department of Transportation (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. Specifically, **this bill**:

1) On and after January 1, 2025, requires cities and counties, to the extent feasible, to apply standard specifications for the use of recycled materials including: recycled base and subbase materials, reclaimed asphalt pavement and other materials in asphalt, reclaimed aggregate, fly ash, returned plastic concrete, and other materials in concrete.

2) Requires the standards applied by cities and counties to adhere to Caltrans' most recently published specifications, including any future recycled materials.

3) Requires these recycled material specifications in order to reduce the cost of maintaining and rehabilitating the streets and highways, and reduce levels of greenhouse gas emissions through material choice.

EXISTING LAW:

1) Provides that Caltrans has full possession and control of all state highways and all property and rights in property acquired for state highway purposes.

2) Requires Caltrans to use recycled materials unless it determines that the use of these materials is not cost effective. Specifies that lifespan, durability, and maintenance cost are factors that shall be considered in determining cost-effectiveness.

3) Defines "recycled materials" to include recycled asphalt pavement (RAP), crushed concrete subbase, and paving materials utilizing crumb rubber from automobile tires.

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

5) Requires Caltrans to phase in the use of crumb rubber (rubber granules derived from a waste tire) in lieu of other materials on projects that use asphalt depending on analysis comparing the cost differential between asphalt containing crumb rubber and conventional asphalt.

6) Requires, by January 1, 2017, local agencies to adopt Caltrans standards (42700) on the use of recycled materials or to discuss why the standards are not being adopted at a public hearing.

7) Encourages 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 with monies from the Road Maintenance and Rehabilitation Account (RMRA).

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 the 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 Caltrans' 2015 Concrete Pavement Guide factors that contribute to optimum pavement use and design include: climatic effects, applied traffic loads, and subgrade quality. This means temperature, precipitation, freeze-thaw cycles, accurate estimations of traffic flow, and uniform support from underlying structural layers of the road are among the pillars of reliable pavement use and design. The quality of materials determine layer thickness and capacity. Accurate characterization of each pavement structure layer's condition and structural capacity is critical to design and performance, especially when it comes to maintenance and rehabilitation strategies. Cracking, erosion, poor durability, curling, and warping can occur on pavement without the correct materials and design.

Caltrans maintains the Pavement Standard Plans and Specifications (PSPS), which are documents that implement the standards, policies, and best practices for pavements on California highways. PSPS contain the standard requirements for bidding, constructing, and administering Caltrans' contracts. Specifications include the Standard Specifications, Revised Standard Specifications (RSS), and Standard Special Provisions (SSPs). Caltrans' Pavement Program also maintains non-standard plans and specifications (nSSPs) for special circumstances.

This bill requires cities and counties to adhere to certain PSPS specifications for recycled construction materials in road base, pavement, and minor concrete applications when designing and maintaining pavement, to the extent feasible. Material specifications included in this bill are as follows:

Caltrans Pavement Standard Plans and Specifications	Description
Recycled base and subbase materials (PSPS Sections 25-1.02 and 26-1.02)	Specific amounts of broken stone, crushed gravel, natural rough surfaced gravel, sand, reclaimed processed asphalt concrete. Specification includes how to properly test the material.
Reclaimed asphalt pavement (RAP) and other materials in asphalt (PSPS Section 39-2.02B)	Includes specifications for producing and placing hot mix asphalt, including the binder methods, testing strategies, and content percentages.

Reclaimed aggregate, fly ash, returned plastic concrete, and other materials in concrete (PSPS Sections 90-1.02, 90-2.02, and 90-9)	Requires concrete for pavement to adhere to shrinkage limitations; Requires cementitious materials type and brand to be on the Authorized Material List (includes blended cement, rice hull ash, and type II or V Portland cement); authorizes use of incorporating returned plastic concrete (RPC) into concrete (excess concrete that is returned to a concrete plant in a plastic state and that has not attained initial set).

Recycled materials in pavement: According to the Department of Resources Recycling and Recovery 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). 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 (GHG) Emissions and Mitigation Report 2020, the most promising additional GHG reduction opportunity for Caltrans for asphalt pavements appears to be 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.

Locals and recycled pavement: SB 1 (Beall), Chapter 5, Statutes of 2017 provides additional funding to address deferred maintenance on the state highway system and local streets and roads. Caltrans and cities and counties are encouraged to use advanced technologies and material recycling techniques where possible and cost effective when maintaining and rehabilitating the streets and highways with monies from the RMRA.

According to the 2018 California Statewide Local Streets and Roads Needs Assessment (assessment), sponsored by the League of California Cities, California State Association of Counties, County Engineers Association of California, Regional Transportation Planning Agencies, and the Rural Counties Task Force, recycling and pavement preservation strategies are reported to have the highest cost savings when compared with conventional treatments. Of the cities and counties surveyed as part of the needs assessment, over 472 local agencies (88%) responded with some information on the types of sustainable practices used. It was found that sustainable pavement strategies may save up local agencies up to 29% compared to new material, and every lane-mile recycled in-place is the equivalent of removing 11 cars off the road for a year.

When using RAP, 182 agencies reported an average savings of 9% as compared with new material. When using warm mix asphalt, 82 agencies reported an average savings of 11%. When using subgrade stabilization, 103 agencies reported an average of 17% additional costs. The most common reasons cited for using sustainable practices were: cost savings or cost-effectiveness, environmental benefits, reduction in excavation depth, extension of pavement life, City Council policies support or require sustainable pavements, lower traffic impact (less construction traffic). The most common reasons cited for not using sustainable practices were: higher construction costs, not enough technical information available, lack of performance data, poor performance from previous projects, and lack of experienced contractors to bid on projects.

The assessment acknowledges that not all streets are good candidates for the use of recycled materials. However, the fact that 88% of the cities and counties in California reported using some form of sustainable pavement practices 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.

Local governments can help promote markets for recycled aggregate because they are large purchasers of aggregate and other road construction products. Some communities are taking steps to promote recycled aggregate, including the following:

- In March 1995, the City of Los Angeles passed a motion requiring that road base in all city projects include "crushed miscellaneous base" with 100% recycled asphalt, concrete, and other inerts, except when site conditions or standards require another specification.
- The City of Modesto has a purchasing practice for on-site street recycling that includes recycled aggregate.
- The City of Palo Alto requires that concrete and asphalt in city projects be recycled.
- Butte County does not require recycling of inerts; however, the local landfill does use clean loads of inerts on site as roadbase or wet weather pads.

Pavement specifications in context: California cannot be a “one size fits all” state, and that is also reflected in its pavement specifications. Local governments in large, urban counties report that the use of 25% RAP in the upper layer and 40% below has raised concerns in terms of durability when used on local road application. These concerns are related to road classification and traffic volume. On low volume local roads, the use of more RAP than what is required for local application will result in rapid deterioration of the pavement causing raveling and rough surface. On high volume roads, the road may deteriorate and cause premature cracking and

potholes. Small, rural counties may have to hire consultant inspectors until local staff is thoroughly trained on recycled concrete practices, and suburban counties may need to identify different suppliers.

This bill provides local governments assurance on exactly what pavement specifications to plan for, with the flexibility and cost feasibility to use new material as needed. The bill emphasizes, "to the extent feasible and cost effective", and articulates locals should refer to Caltrans' "most recently published pavement specifications." There is room to further consider how "most recently published pavement specifications" is defined, however the intent is for locals to continuously improve upon their use of recycled material without returning to the Legislature for permission to use the most recent Caltrans specifications.

According to the author, "Construction materials of aggregates, asphalt, and concrete are required to build and maintain roads. In turn, road repair and maintenance generates large quantities of aggregate, concrete, and asphalt rubble that can be recycled and re-used in road construction. While much progress has been made in recycling these materials, about a million tons are sent to landfills each year. The use of recycled construction materials helps conserve natural sources of aggregates, preserve embodied energy of manufactured concrete and asphalt, conserve oil resources, and reduce greenhouse gases from less transport and production of new materials. Caltrans has standards that allow for the use of recycled construction materials in road base, pavement, and minor concrete applications. Although there are cities and counties that match or exceed Caltrans standards, there are many that either do not allow the use of recycled construction materials or don't allow them to the extent allowed by Caltrans' standards. This important measure will require, to the extent feasible, that cities and counties allow at least the same percentage of recycled materials for aggregate base, hot mix asphalt, minor concrete, reclaimed fly ash, and returned plastic concrete as Caltrans."

In support, the California Construction & Industrial Materials Association writes, "The use of recycled construction materials is sound, cost-effective, and environmentally responsible, and should be practiced by all state-funded entities helping to build our state's infrastructure. We support AB 1035."

Previous Legislation: 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. *This bill was held by the author in Senate Transportation Committee in light of the COVID-19 pandemic.*

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. *This bill died in Assembly Transportation Committee.*

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

Associated General Contractors
Bender Ready Mix Concrete, INC.
California Construction & Industrial Materials Association (Sponsor)
Calportland Company
Cemex INC.
Engineering & Utility Contractors Association Dba United Contractors
Golden State Natural Gas Systems
Granite Construction Company
Hi-grade Materials
Holliday Rock Company INC.
Master Builders Solutions

Outback Materials
Soiland Co., INC.
Southern California Contractors Association
Superior Ready Mix
Sustainable Pavement Technologies
Syar Industries, INC.
Teichert, INC.
Zanker Recycling

Opposition

None on file

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