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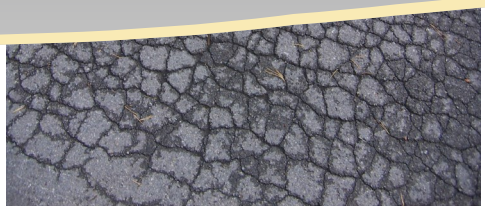

Oxnard School District pavement management plan boosts success

Maintaining nearly three million square feet of pavement is like mowing the lawn of 51 football fields. But Jorge Gutierrez, Executive Director of Facilities at Oxnard School District, and his staff, are charged with that responsibility at 21 schools, two service centers and a warehouse. With the help of a pavement management plan, they have succeeded well.

"The District has implemented numerous projects using our customized pavement management plan," said Gutierrez. "All of these projects have been very successful."

For large schools districts, like Oxnard, the value of a multi-year management plan is more than an inventory of pavement conditions at each school site. It provides all the information necessary to select the right projects at the right time and help those in charge manage their pavements and their budgets.

"A pavement assessment takes a proactive approach to evaluate the conditions of asphalt," said Gutierrez. "It provides a plan of action to address these conditions as well as provides preventative maintenance measures. As a result, it prolongs pavement life and saves public money. More importantly, it addresses safety issues."

Pavement management plans can be updated every three years to ensure that the original assessment goals are on target and to monitor the effectiveness of the applied treatments.

Take a load off to extend pavement service life

"Take a load off" is an invitation to sit back and relax for most people, but for pavement engineers, taking a load off has an entirely different connotation. It's an invitation, an incentive to protect pavement against premature failure.

There are a two ways a pavement deteriorates. The first is environmental aging from sun and water. The second is fatigue from heavy wheel loads or traffic. Of the two, the greatest accelerant to pavement deterioration is loading. Although school districts don't have much control over the environment, they can mitigate load-related deterioration due to heavy buses and garbage trucks.

Cars and light trucks have little impact on the pavement structure. However, due to their size and weight, school buses and garbage trucks have an enormous impact. That impact is measured by ESALs or "equivalent single axle loads." One ESAL is equal to one 18,000-pound axle. The greater the vehicle weight or load, the greater the stress on the pavement and the greater the cumulative damage. ESALs are then quantified as a Traffic Index (TI), a single number that subsequently determines how much loading a pavement will support before it begins to fail. It also provides a basis for designing pavement to withstand the expected loads. As an example, a TI of 5.0 is equal to 7,160 ESALs. A TI of 8.0 is equal to 372,000 ESALs. A high TI generally means pavement sections must be thicker and stronger to withstand the loads. A lack of structural adequacy is a primary cause of rapid pavement deterioration.

To understand this better, think of pavement like a beam. It supports the structure above it, but unlike rigid beams that support a building structure, pavement flexes each time a vehicle impacts it. The top of the pavement structure is compressed from the load while the lower portion expands or stretches. Each time a heavy vehicle passes over a pavement section, it consumes some of the pavement's life and loses some of its ability to flex. Over time and with repetitive loads, the asphalt layer begins to break down, not at the top, but at the bottom where the pavement expands to absorb the load. Cracks migrate to the top and usually show up first as alligator cracking, a topic discussed in the July issue. As the pavement structure, its supporting soils and the

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Take a load off
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loading vary, so does the time it takes for cracking to appear. Once it does, however, it can accelerate quickly to potholes and complete base and structural failure without prompt attention.

The right "fix" for alligator cracking or potholes can be as simple as removing an area of asphalt and replacing it with new asphalt concrete. But localized repairs can be costly, so when these areas exceed about 10 percent of the total surface area, it may be more cost-effective to overlay the pavement, which will strengthen the overall structure, adding several more years of pavement life.

Though fatigue-related deterioration is not entirely unavoidable, school districts can mitigate some of the potential damage from heavy wheel loads to its pavements in three ways.

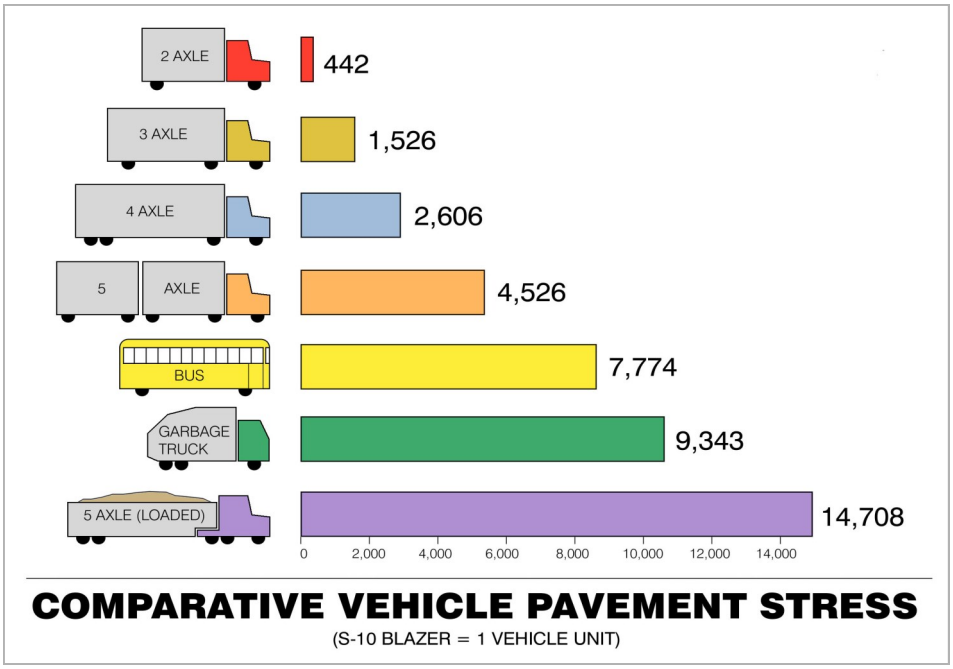
First, districts can regularly assess school pavements for signs of fatigue or load-related deterioration and address problems immediately. School M & O personnel offer the first line of defense in this effort. Delaying or deferring treatments for budgetary reasons may be tempting, but ignoring even the smallest maintenance procedure accelerates the deterioration cycle and inflates the costs down the road.

Second, districts may be able to relocate bus drop-off and trash pickup locations to skirt parking lots and school roadways.

Third, schools can replace asphalt pavement in bus unloading areas with non-flexible concrete pads of sufficient size and depth to support the weight of a fully loaded school bus. The same is true for garbage and delivery truck access points. Rigid concrete slabs, though far more expensive per square foot than asphalt, have significantly longer lifespans than asphalt concrete pavement, which makes them an attractive alternative based on a lifecycle cost analysis.

By taking steps to mitigate the effects of load-related stresses to its pavements, a school district potentially can save thousands of dollars in future rehabilitation costs. That really takes the load off, not just from pavements, but budgets, too.

The graph below equates heavy vehicle loads to a single SUV



Tip of the month - If you read our September newsletter, you know the difference between three pavement management styles: best-first, worst-first and critical-point. Of the three, critical-point management is the most cost-effective over the long run, but just how cost-effective is it when compared to worst-first management? We've done the math and determined, on average, that critical-point management, when combined with timely preventative maintenance, can add about four years to the service life of low volume residential pavement and can reduce maintenance costs by as much as 60% over that same period. What's your pavement management style?

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Pavement Engineering, Inc. is California's premier pavement engineering and rehabilitation expert, specializing in evaluating, designing, managing, inspecting, testing, implementing and maintaining asphalt and concrete surfaces for public and private entities.

We provide the technical expertise to maintain roadways and parking lots cost-effectively, the managerial experience to make sure things run smoothly from inception to completion, and the proven track record that builds trust and loyalty.

Our number one goal is client satisfaction. We manage every dollar our clients spend as if it were our own – with common sense.