

Sustainability Considerations for Streets and Roads



Executive Overview

Prepared by the
American Concrete Pavement Association



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Summary

Long before there was a “green” movement, many people recognized the significant impact that pavement type selection can have on the environment around us

Sustainability, balancing environmental requirements with societal needs and economic considerations, is one of the most important issues of our time. Here are just a few examples of how concrete pavements contribute to sustainability goals:

Recyclability and Reuse—Concrete is the most recycled construction material in the United States, according to the Construction Materials Recycling Association. Concrete is 100% recyclable and reusable, and can be used as aggregate in new concrete pavements, base materials for new roadways, or for other uses, including erosion control and flood prevention.

Local Supplies—Concrete pavements are typically produced from abundant supplies of locally available resources, such as rock, sand, cement, and water. Concrete diverts large volumes of materials away from waste stream; examples include slag, which comes from iron manufacturing, and fly ash, a byproduct of energy production.

Light Reflectance—Concrete is naturally light-reflective, which reduces street lighting requirements (and saves energy). Scientists call this “albedo,” and this feature in concrete enhances safety and helps reduce urban air temperature, reducing heat island effects. Darker colored paving materials cannot provide these benefits.

Durability—Because concrete pavements last longer than other pavement materials, they don’t waste additional resources, including the fuel consumed in frequent maintenance and repair of pavements made from less durable materials. This also means that there is less traffic congestion with concrete pavement which, in turn, saves fuel that would be used by cars and trucks waiting in traffic, and lowers pollution emitted from vehicles idling in long construction work zones.

Fossil Fuel Savings—Vehicles traveling on concrete roadways use less fuel because the “rolling resistance” is much lower than on other paving materials. A study published by the National Research Council of Canada in 2006 shows that trucks get an average of almost 4 percent better fuel efficiency on concrete



Photo courtesy of the American Coal Ash Association.

Photo illustrates fly ash, which along with slag, helps divert large volumes of materials away from the waste stream.

pavements. A recent study published by the University of Texas at Austin suggests similar fuel economic advantages for cars on concrete pavements during city driving.

Concrete pavements also require less fuel to construct than roads built in many thin layers, like asphalt. In fact, Federal Highway Administration data concludes an asphalt roadway requires about 5.5 times more diesel fuel to construct than a comparable concrete road designed for the same traffic.

For today and tomorrow, concrete pavements are the most cost-effective, most sustainable choice for streets and roads.

For questions or assistance with a comparable pavement performance and life-cycle cost analysis in your area, please follow this link or scan the QR code (at right) to find a local technical representative at [efficiency http://acpa.org/chapters/allchaps.asp](http://acpa.org/chapters/allchaps.asp).

