

mit serious violent crimes by age 18.

Nine percent of the boys who had experienced both difficulties committed murder, rape, assault, or other violent crimes by the time they turned 18. By contrast, only four percent of the boys with neither characteristic followed that path. And the percentage for those who had experienced only one of the problems was even lower: three percent of the boys with only birth complications, and two percent of those with only maternal rejection.

The infants' twin disadvantages played out early in life. Among men who turned to vio-

lence *after* age 18, there is no sign that these handicaps played any special role.

The authors suggest that disruption of mother-infant bonding early in a child's life may result in "more callous, affectionless, unempathic, psychopathic-like" behavior. That increases the likelihood of violence—especially in individuals who also suffered birth complications, which can cause neuropsychological damage, weakening their self-control and making them prone to "explosive, impulsive aggression." Providing mothers with better prenatal health care, the authors say, might be one way to fight crime.

Overhauling Highway Design

"The Asphalt Rebellion" by Alan Ehrenhalt, in *Governing* (Oct. 1997), 1100 Connecticut Ave. N.W., Ste. 1300, Washington, D.C. 20036; "Look, Ma, No Hands!" by Corinna Wu, in *Science News* (Sept. 13, 1997), 1719 N St. N.W., Washington, D.C. 20036.

For decades, America's roads and highways have been getting wider, in accordance with the engineering design principle that wider means safer and more efficient. Alas, it has also meant turning city streets and scenic country roads into multilane speedways. Now, the assumptions behind this trend are coming under challenge. In New England and elsewhere, writes Ehrenhalt, executive editor of *Governing*, "a rebellion against an entire half-century of American engineering ideology" has begun.

That ideology, he says, is embodied in a 1,044-page tome published by the American Association of State Highway and Transportation Officials (AASHTO) and commonly known as the "AASHTO Green Book." Federal law no longer requires that roads built with the help of federal funds adhere to Green Book standards, but that publication remains the engineering profession's sacred text, Ehrenhalt says. It makes safety the primary objective in highway design; insists that safety means accommodating drivers traveling at high, even illegal speeds; and assumes that safety at high speeds requires wide roadways.

Local officials in New England and other regions have been challenging those assumptions. When Connecticut's state government offered two years ago to help address problems with a 17-foot-wide stone arch bridge on a picturesque rural road in southwestern Connecticut by replacing it with a 28-foot-wide structure of steel and concrete, Redding selectmen told the state highway engineers to

take their \$350,000 in state and federal aid and get lost. "It's a sad commentary on our system," said First Selectman Henry Bielawa, "when historic preservation, neighborhood esthetics and common sense are displaced by cookie-cutter design requirements." In the past year, Connecticut has relaxed its rules on bridges, while Vermont has enacted a law virtually inviting its transportation department to depart from AASHTO standards in road building. Maybe, the "Asphalt Rebels" assert, high-speed travel is not always the highest good.

The principle that safety requires width is also coming under challenge from a different, perhaps ultimately more powerful source: technology. Under the 1991 Intermodal Surface Transportation Efficiency Act, a research consortium has been working to develop a prototype automated highway system. Such a system, reports Wu, a *Science News* writer, "promises to reduce accidents, cut travel times, and reduce fuel consumption and pollution"—and to reduce the need for new, ever wider highways.

Under one approach, ceramic magnets would be embedded in the roadway, spaced a few feet apart. Automated cars equipped with sensors and tracking one another through radio signals would travel at high speeds close together in a pack without the intervention of human drivers. This could double or even triple the lane capacity of existing roads. And the cost of automating an existing highway would be only a fraction of the cost of building new roads.