**Bumpy ride ahead through pothole purgatory**

**Patch as patch can: Frigid weather and overuse maintenance blamed for pothole purgatory**

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By Allen G. Breed, AP National Writer

Hate potholes? Well, unless you and your elected officials are ready to cough up billions more for better roads and proper preventive maintenance, buckle up, ‘cause it’s going to be a bumpy ride.

“What people have to understand is you can’t have a pothole without first having a crack in the pavement surface,” says engineer Larry Galehouse, director of the National Center for Pavement Preservation, a quasi-g

University. “Agencies have been cash-strapped for a number of years, and now it’s all coming home to roost.”

And despite all the advances in patching materials and equipment in recent years, engineers say that until someone ponies up, it’s going to remain a case of patch as patch can.

“If you’ve got a pavement in poor condition that’s got a lot of alligator cracking … where water is getting into the pavement and freezing and thawing, it’s going to break up the structure,” says Kevin J. Haas, a traffic freezing and thawing, it’s going to break up water is getting into the pavement and

“If you’ve got a pavement in poor condition that’s got a lot of alligator cracking … where water is getting into the pavement and freezing and thawing, it’s going to break up the structure,” says Kevin J. Haas, a traffic investigations engineer with the Oregon Department of Transportation in Salem. “It’s just the law of sciences and physics and thermodynamics and whatever other laws you want to throw in there.”

This winter, the law is coming down hard on Americans.

In New York City, road crews have patched a record 136,476 potholes since Jan. 1. The Department of Transportation had filled just under 57,000 by this same time in 2013.

New Engalmers, famous for their meteorological stoicism, are reeling from what Boston Public Works Commissioner Mike Dennehy calls a “pothole eruption.”

“We filled our 6,000th pothole this morning since Jan. 1,” Dennehy said Tuesday. Last year’s comparable figure was about 1,600.

vaunted “Potzilla” — a massive truck that keeps the fill material hot en route to work sites. An electrical failure last weekend caused the heating core and hydraulic systems to quit, forcing workers to shovel up 2 tons of dried asphalt from the machine’s bowels before the beast could hit.

And while Sweden has also borrowed something from his country, which he believes has stricter rules on asphalt composition and road construction than the U.S. to account for the wet and cold. He says additives such as cement and lime are compulsory in the top layer of asphalt on Swedish roads, and that there are even stricter limits on air bubbles within the asphalt.

But he says Sweden has also borrowed a page from road builders in Arizona and California, who use rubber in the mix to avoid cracks. “Some U.S. states use it to a great extent,” Wendel says. “But not on the East Coast.”

In fairness, Thomas Bennert, a research professor at Rutgers University’s Center for Advanced Infrastructure and Transportation, says it’s hard to compare Stockholm with New York.

“You can go to parts of Scandinavia where I’m sure they don’t have to really do anything, because the roads are not really traveled as heavily,” he says. “You do need that pounding of the traffic to really hit it.”

Regardless of what they’re doing elsewhere, what really matters is what’s happening right here at home, says Galehouse. He says Americans pay about $21 a month on average in state and federal road taxes — a fraction of what they pay for cable television or a cell phone.

“And yet what is one of our most expensive investments out there?” he says. “It’s our automobile. And we’re wrecking our automobiles because we’re hitting potholes … The key is preventing them. The key is preventing them.”

But the patching goes on.

Boston has “Potzilla.” Others are investing in so-called “pothole killer” machines, says Haas.

“A person right from the cab of the vehicle can blow highly compressed air to get all the water and debris out of the pothole,” he marvels. “It uploads its asphalt and aggregate mixture down into there, and then it compacts it — all in one breath. And it just moves on the pothole.”

Still, much work being done this hectic season has been what those in the industry call “throw-and-roll” — slap some “cold mix” of stone and liquid asphalt into the hole, roll it with the truck, and ver it with the truck.

Researchers at Nottingham Trent University and the University of Nottingham in England found that applying a coat of bitumen emulsion between two layers of asphalt greatly improved its resistance to further cracks. They also confirmed that a hot mix repair — in which the asphalt was heated to 284 degrees or higher — was the best option for fixing holes 1 inch and deeper.

If “a few simple and cost-effective measures are applied with each repair then there may be less need for as many repeat repairs,” and savings could be in the millions annually, Mujib Rahman, one of the study’s co-authors, said in a university release last February.

All of this is cold comfort for American drivers.

Robert Sinclair, a spokesman for the American Automobile Association in New York, says his branch received more than 13,000 calls for flat tires in January, a 25 percent increase over last year.

“Just about all flat tire calls are potholes,” he says.

Manhattan’s streets are such a minefield that rolling over a hole is often the lesser of two evils, says New York cabbie Ishlaq Meaw.

“They’re deep and everywhere,” says the 20-year-old driver, whose cab suffered a blowout Tuesday. “But sometimes in New York City, you can’t avoid them. There’s too much traffic coming … You just got to take a risk.”

Associated Press Writers Malin Rising in Stockholm, and Deepthi Hajela and Amanda Barrett in New York City also contributed to this story.