

Potholes are Not Inevitable

Okay, perhaps an occasional pothole is statistically likely to come your way. But (and here comes the tough love), if your streets are littered with potholes, it's time to re-evaluate some of your life choices.

Let's look at why this is happening to you. Potholes can find their origin in many ways, including but not limited to:

- Poor subgrade soils at the time of construction (i.e., someone should have undercut the area)
- Deteriorated subgrade soils because of drainage issues or excessive cracking of the surface (yeah, so we need to fix that)
- Insufficient subbase stone for proper drainage (saved a little bit on stone way back when and been paying for it ever since)
- Poor asphalt mix during the last overlay
- Lack of proper tack during the last overlay (don't even get us started)
- Poor or uneven compaction during the last overlay
- Unwillingness to seal surface cracks when they began appearing
- Excessive amounts of heavy trucks for the pavement design



Oh, it's not a judgement. We say, let those with the perfectly constructed and perfectly maintained roadways be the first to pick up a stone and start throwing. No, we're just observing the obvious.

So let's first talk about pothole avoidance. If some of your roads were not built by today's best standards, you are in large company. We probably all have at least some of those in inventory and that may be the predominant story for many jurisdictions.

You are probably not going to dig it all back out and start from scratch and even if you did, you might still be limited for right-of-way and have to compromise drainage and so forth. Now, in many cases, full-depth reclamation (FDR) can be a smart option, where you pulverize the existing pavement and perhaps the subbase stone, add in some binding agents (like cement or lime), wet it, shape it, and compact it. Under some circumstances, you can cure many of the road's ills, but make no mistake, you are unlikely to achieve all that you would like to with FDR alone. No, our old legacy roads will never quite stop challenging us, but we can absolutely do things to improve our fortunes going forward.

But new roads are still being designed and built, often times by developers that "gift" them to you. Accept nothing less than a properly designed and constructed roadway, regardless of whether you are funding it or someone else. If your agency must maintain it, any compromise you make will be decisions you pay for over and over throughout time.

For your better roads, be proactive with a thorough pavement preservation program. A high quality asphalt overlay can minimize the opportunity for early pavement distress – come to our Asphalt Best Construction Practices training workshop the next time it is offered to learn

more. What do you know? There's one scheduled this month! You don't have to be a rocket surgeon to understand the fundamentals of good asphalt construction and we believe we can get you there in one morning.

Once you have a nice, new pavement, put it out of your mind. Sit back and rest on your laurels and give it not

another thought. Wait until nine, ten, twelve years in, when the complaints start to sound like nails on a chalkboard, and then sit tight another few years. Don't be such a micro-manager.

No, you see what that there is, is that that's sarcasm. Don't do that.

Well-constructed asphalt is going to develop some cracks. It's just physics. And, well, probably chemistry. But regardless, we're not getting into that here. The point is, asphalt will develop cracks and when they are environmental cracks that come from thermal expansion/contraction, and other forces, that's nothing to worry about. They will show themselves as early as 2-3 years in or could take a bit longer, but when they do and you have some cracks greater than $\frac{1}{4}$ ", it's time to properly seal them and that's something you will want to revisit every couple of years thereafter and stay ahead of them. It's the cheapest tool you will ever use to extend the life of your pavement.

For lower volume roads, fog seal (think driveway sealer but hopefully with somewhat better material specifications) can be effective to seal out those smaller cracks (and freshen up the appearance to make smiley faces as well).

Techniques like those, assuming you have a reasonably sound base for the roadway, and assuming that your paving operation used good quality mix and tack was properly applied and you got good compaction, can ward off most potholes for a long time. Granted, at some point you will need some other techniques like chip seal or microsurfacing, and you can learn a lot more about all those tools at [RoadResources.org](https://www.RoadResources.org). Oh, and you can see some examples of these tools on our Delaware T2/LTAP YouTube [channel](#).

But yes, even if you really do have all your ducks in a row from design to construction to maintenance, you may still experience a pothole here and there. We find that if you ignore these, they will go away in time. No, see, that was sarcasm again.

They don't improve with age, so get on them as soon as you can. Yes, you may have to buy some time with cold patch in the winter, but when the weather clears, a proper patch is much better. At a minimum, a properly saw-cut patch with good quality asphalt and thorough compaction is a better bet than cold patch or throw and go. Done right, you won't be back to it for some time.

Of course, compromise the material, the surface preparation, or the compaction, and you



may as well have just put more cold patch in it. If you have patches that look worse than the surrounding area in just a year or two, it's time to up your game. If you find you are going back to patch part of the patch in a couple of years, well, you're going to get an earful from the residents. Cut the pothole out larger than you think you need to, prep the hole well, apply tack, buy good material, respect that material with good compaction, and you stand a good chance of receiving the Local Government Superhero Award this year.



That's another little joke – there is no superhero award. But there should be, right?

The headline of this article is a bold-faced lie, intended to draw you in and if you made it this far, you're a good sport. Yes, potholes are inevitable, even when we are at our best. But we can reduce their numbers with good paving work and we can ward them off with pavement preservation tools, and then when the one or two a year develop, quality pothole patching can reduce their spread and re-occurrence.

And who knows, maybe some kindly resident will write a letter to the editor to comment what a clever public works manager you are and how polite you are to the elderly. Mark our words – some day public works people will be revered and it's going to be glorious.

The Delaware T²/LTAP Center's Municipal Engineering Circuit Rider is intended to provide technical assistance and training to local agencies, so if you have pavement management questions or other transportation issues, contact Matt Carter at matheu@udel.edu or (302) 831-7236.