This weekend, traffic in Los Angeles is predicted to come to an absolute standstill when the I-405 freeway is closed from this
evening (July 15) until early Monday morning (July 18) while construction crews add lanes to the notoriously jammed-up road. That amounts to a 53-hour, $1 billion project that LA Mayor Antonio Villaraigosa has predicted to be a nightmare so hellish that it has earned its own nickname: "Carmageddon."

As an Angeleno, I have developed a few simple rules for driving on the west side: 1) Never get on the 405 after 3 p.m., in any direction. 2) Watch out for idiot drivers. It only takes a few idiot drivers to turn a smooth-moving stream of traffic into a parking lot. 3) Refer to Rule 1.

Some days a 15-mile drive will take 18 minutes. Other days it will take an hour and 18 minutes, and there is no way of preparing. So you can count me among the thousands who hope this weekend's shutdown of the 405 will yield some (any!) improvement.

Life's Little Mysteries wanted to take a closer look at what causes the massive traffic mess that makes the 405 the third worst bottleneck in the country, and whether this weekend of pain will result in some sort of gain. We asked some of the leading traffic science experts, and here's what we found.

**Life's Little Mysteries: Why does traffic in LA suck so much?**

**Mark Hallenbeck, director of the Washington State Transportation Center at the University of Washington:** The basic reason is simple. There are just too many cars and not enough lanes. And the reason Los Angeles got to be that way is because the greater metropolitan area was built to use cars. That works with low density, but it doesn't work as a city's density increases. LA has just run out of places to grow. It's actually the densest metro area in the United States. The basic problem is that as more people arrive, land becomes more valuable, so it's more difficult to widen roadways.

And even by adding the extra lane, if you shove people into the pipe downstream, all you do is move the bottleneck a handful of miles down the roadway. It'll be better here, but the next segment down might be worse. [Read: Jammed Up: The 7 Cities With the Worst Traffic]

**LLM: So it's really just a matter of too many people and too many cars on the road? (shakes fist)**

**Hallenbeck:** Well, there's a second thing. We've spent the last 80 years building roads. The older a road gets, the more you have to repair it, and repair is difficult because people are currently using them. You have to kick them off the roads in order to maintain them, and where do they go? It's one thing to build a road, because it doesn't exist before that. You can take your time and make sure it's perfect. But once you have to upgrade, it's either a matter of doing construction over two years between 10 p.m. and 4 a.m. or it's a matter of ratcheting up the pain level for one weekend. The tradeoff is, it's over with quickly.

**LLM: What about the way some people drive? Does that have an impact on congestion? (shakes fist harder)**

**Hani Mahmassani, director of the transportation center at Northwestern University:** Research shows that inefficiencies on the roadway cost us about 30 percent of nominal throughput — so we're getting almost a third less out of our roads than we could be. And one of those inefficiencies is the way people drive.

Phantom bottlenecks are a major contributor. As vehicles start following each other closely, the whole system becomes a slave to the worst drivers. It only takes one idiot to affect everybody in a chain reaction. Over the past decade, we researchers have come to understand these phenomena much better. Individual actions and the lag in reaction times lead to the provocation of these shock waves. The good news is, car technology is getting better to take matters out of our hands. There is also some good work in something called "speed harmonization" in Germany, which works to slow cars before a more congested area, so a bottleneck
doesn't happen. [Read: The 10 Worst Traffic Bottlenecks in the United States]

**LLM: Is widening the 405 actually going to help anything?**

**Mahmassani:** Typically what happens is that freeways bring their own demand: if you build it they will come. One will see an improvement in the short term, it will allow more activities to take place. But in the long term, probably not.

**Matthew Turner, professor of economics at the University of Toronto:** My group did a study where we measured the miles of interstate highway and major arterial roads in every U.S. metropolitan area, and the total amount of driving on those roads. We found that any increase in the amount of roads caused exactly proportional increases in driving. So 1 percent more roadway would lead to 1 percent more driving.

Some people say if we build roads, people will use them — so we shouldn't build roads. But what if we substituted something else in place of roads, say, shoes? You wouldn't say that we should not make shoes because people will wear them. It's a matter of balancing the value of shoes with the cost incurred to get them. To me, the interesting question isn't if this project will reduce congestion, but whether that $1 billion results in extra trips valuable enough to justify the cost.

**LLM: OK, so what actually would help congestion in LA?**

**Michael Manville, researcher at UCLA's Institute of Transportation Studies:** Here's the thing: for every other form of infrastructure we have, we pay taxes for building it, then a fee to use it. In a water project, we build the pipes that bring the water in then we pay for the water we use.

But when it comes to our freeways, we build them and then charge nothing whenever you want to use it. Roads are the only infrastructure that collapses twice a day, and it's because we don't charge to use it. We continue to try to build our way out of it and it doesn't work. You'd think twice about running the air-conditioning all day or leaving your water running when you leave the house, because you start to use a resource more judiciously when it comes out of your wallet. That's what we need to do with roadways.

When you have road tolls, people change their behavior. National household travel surveys show something amazing: Almost half the people on the road during rush hour are going to places other than work or school. Faced with a toll, people may make a different decision. And because congestion is not a linear phenomenon, you only have to remove a small amount of cars to get an improvement in flow.

Now it's just politics. Most drivers are voters, and people have been accustomed for a long time to roads being free. Roads are in high demand, and we give them away for free. No one should be surprised that there is a shortage of road space every morning and afternoon.

This story was provided by Life's Little Mysteries, a sister site to LiveScience. Follow Life's Little Mysteries on Twitter @llmysteries, then join us on Facebook. You can follow Katherine Gammon on Twitter @kategammon.

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