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## Why the Concept of Induced Demand Is a Hard Sell

Both the public and policymakers have trouble understanding why building more roads and highways does not reduce congestion.

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Gary Toth worked for the New Jersey Department of Transportation for almost 34 years, watching as roadway and highway development spread across the state and congestion grew worse.

The New Jersey he remembers from his youth was a state with a population clustered around rail lines and waterways, marbled with walkable towns and cities connected by train service. As highways were constructed throughout the

state, however, they quickly filled with cars. New Jersey became a byword for sprawl and congestion. The answer, throughout his time in the state transportation bureaucracy, was to add more road capacity to make driving easier.

But that fix, while popular, never lasted. The new roads, the new lanes, soon filled with traffic too. There were, it seemed, always more cars.

“There were people, even inside transportation agencies, who didn't understand that this was going on,” says Toth. “They didn't make the connection between [more roadways attracting more drivers]. So how can we expect the public to make that connection?”

Toth is referring to the concept known as induced demand: New roads will attract more drivers, because giving something away for free means more people will use it. That means adding lanes to a highway will perhaps ease congestion in the short term, but those gains will eventually vanish as the road fills with more drivers.

Induced demand has been theorized for [almost 100 years](#), formally studied [beginning in the 1960s](#), and [quantitatively measured](#) in the 1990s and the early 21st century. This basic concept is key to understanding congestion relief, which is arguably the central policy goal of American transportation planning.

But it is not an intuitive idea. In fact, a series of new studies, the latest [published this February](#), has shown that it is one of the least understood concepts in transportation policy.

“Most people don't know what induced demand is,” says Calvin Thigpen, who is director of policy research with the micromobility company Lime. “There's a reason if you're going to become an engineer, if you're going to become a transportation planner, it's in the coursework. You need to learn it because it's not intuitive.”

Every year the United States spends billions of dollars expanding roadways in the name of congestion relief. It's easy to understand why. Sitting in traffic is a soul-deadening experience and all the more so if it happens regularly. It also incurs macro-consequences, harming the [health of drivers](#), those who [live near](#)

major roadways, and driving climate change. Like cigarette smoking, [there is never good news](#) about traffic congestion's health outcomes. Transportation, meanwhile, is the largest contributor to [America's greenhouse gas emissions](#).

Nonetheless, spending on highways is set to be turbocharged in the coming months and years, as [2021's infrastructure act](#) routes even more federal funds to state departments of transportation. The [politically popular move](#) will be to use that money to build new highways and expand existing ones. Here's why most transportation experts say state and federal officials should resist that understandable temptation.

The New Jersey Turnpike near Newark. Every year the United States spends billions of dollars expanding roadways in the name of congestion relief. Spending on highway is set to be turbo charged in the coming months and years, as 2021's infrastructure act routes even more federal funds to state departments of transportation.

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## How Induced Demand Works

Everyone has had the experience of being stuck on the highway, encased in bumper-to-bumper traffic, cursing the short-sighted engineers who didn't build

the damn road wide enough. But transportation experts say this idea violates the basic principle of supply and demand. If you reduce the cost of something, people will consume that product with greater gusto. That happens with driving too. If the speed of traffic in a given network increases, that prompts people to drive more.

“People think of traffic like a liquid and if you widen the pipe, it won't clog anymore,” says Amy E. Lee, of the University of California, Davis, and one of the researchers behind [a new induced demand calculator](#).

“But there is not a static or set amount of fluid in this analogy,” says Lee. “There could always be more liquid. Because we are talking about humans who are dynamic and responsive to things like a change in the perceived ease with which they can get places.”

When highway options expand, people take trips at peak hours that they may have delayed until a different time. They shift away from public transit or go to a restaurant that's an additional five miles away. They head out on the highway when they otherwise may have stayed home or walked to a neighborhood bar.

Induced demand has been found in societies across the world, like Japan and Western Europe. But its logic is especially obvious in the United States where the overwhelming majority of households own cars. There are always more people who could decide to be on the road.

In 2009, Matthew Turner and Gilles Duranton [published research](#) from data for all metropolitan areas in the U.S. between 1980 and 2000. They found an almost perfect correlation between lane mile construction and vehicle miles driven.

Critics argued that their research shows transportation engineers are building roads where people want to drive, but Turner argues the causality is reversed. Building more roads caused people to drive more. (It's worth noting that their research did not find that expanding public transit is an answer to induced demand, because those who switched to rail would make the highways momentarily less crowded — tempting more drivers to head out.)

Turner has a different analogy than the water pipe. He compares America's road building to how the Soviet Union distributed bread. If bakeries are free, when they open their doors people start queuing. As a consequence, there are always lines for bread and some people who really need it don't get it.

"We build a bunch of capacity on our highways, which people can get on for free, so they do," says Turner. "If you make more bread and give it away, you won't necessarily get to the back of that queue because people will take more and more."

## **Why Induced Demand Is Hard to Understand**

Despite the almost universally accepted concept of induced demand, corresponding changes to American transportation policy have been limited. Even the failure of congestion mitigation in cities like [Los Angeles](#) and [Houston](#), where highway-centric policy has failed most visibly, has not lessened the thirst for more highway dollars. In fact, spending on roads is [one of the few policy ideas that most Americans agree on](#).

Recent research of public comprehension of transportation policy ideas bear this out.

[A Feb. 6 study](#) in the journal *Transportation* released the results of a quiz of almost 600 American adults and found that 64 percent of Americans believed that widening roadways had a long-term effect on congestion relief. Reading an explainer refuting the concept only changed their minds in the short term; within six months they were back to embracing their original incorrect understanding.

A companion study [published last year](#) found only 24 percent of self-identified conservatives and 45 percent of their liberal counterparts knew that building our way out of congestion is not an option. This trend isn't new or specific to the U.S. In recent years studies have found similar beliefs among similar proportions of [Americans](#), [French](#), [Finns](#) and [Swedes](#).

"I've talked to a lot of people in my life, friends and loved ones, about this topic," says Thigpen. "There's almost a resistance to acknowledge that it's a phenomenon that happens time and time again. It's attractive to think we can just build our way out of these problems. But, in fact, we can't."



Thigpen and his colleagues' research showed that those who understood induced demand were much less likely to support expanding highways to reduce congestion. The question is whether it makes sense to target laypeople and convince them about the realities of induced demand or to educate policymakers (elected and bureaucrats alike).

When Toth was with NJDOT, his team developed videos to distribute to local television stations, explaining why widening highways wouldn't address their congestion concerns. The idea was to create a mass education campaign about the negative health and environmental effects of ever-increasing amounts of driving, delivered through one of the most popular forms of local media.

"We were going to do something on transportation and land use, and this whole idea of induced demand," recalls Toth, about a period in the mid-2000s. "Tonight at six, why the area you live in may be slowly killing you or affecting your health.' We were going to start developing little PR videos. Then the governor changed, and we lost all the steam."

Thigpen says that targeting policymakers with an education campaign would be more effective.

The challenges, however, are immense. An entire industry has been built up around endless road expansion and advocacy organizations like the American Society of Civil Engineers are skilled lobbyists for continuing current practices.

Aerial image of the I10 Katy Tollway Houston Texas. At one point, the highway is 26 lanes wide, making it the world's widest road.

(Felix Mizioznikov - stock.adobe)

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Engineering schools do not often touch on the topic. In a forthcoming paper, Thigpen and his colleagues surveyed students of planning and engineering schools about the concept and found the latter were much less likely to have knowledge of induced demand. Toth agrees that understanding induced demand was not broadly shared across NJDOT. The planning department, where he worked, was convinced. But the design and engineering departments were not.

“These agencies are so diverse, and there's competing divisions inside the agency,” says Toth. “It hasn't yet transformed the approach of all agencies across the board. Then there's certain states, more rural states, where they still have so much open land and they still connect freeway access with economic growth.”

Politicians present their own challenges. Transportation experts say that the way to defeat induced demand, and actually ease traffic, would be to price roadways through tolls and congestion fees. But such alternatives are not popular. It's hard to imagine running a political campaign on such a promise,

as opposed to pledging an answer that looks free and easy.

Politicians frequently promise voters congestion relief, and they may even deliver it in the short term. But once the roads begin to get congested again, the elected official who stood proudly behind the ribbon cutting might be long gone.

In short, highway expansion is too easy an answer and may be one America just can't quit.

“Highway expansion is an attractive project regardless of your political orientation or what the state of the economy is,” says Thigpen. “There's always a good argument for why we should be expanding highways. We need more jobs, or we need to unlock economic opportunity. There's always a good political argument in favor of that.”

*This is the first article in a two-part series. [The second article](#) looks at how the idea of induced demand could change policymaking within state DOTs and alternative ideas that elected officials could pursue.*

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