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When state DOTs bring streets through cities, they apply highway standards (above, Okeechobee Boulevard in West Palm Beach, Florida). // Screenshot via Google Maps

## **Why 12-Foot Traffic Lanes Are Disastrous for Safety and Must Be Replaced Now**

JEFF SPECK OCTOBER 6, 2014

**Let's make "10 not 12!" a new mantra for saving our cities and towns.**

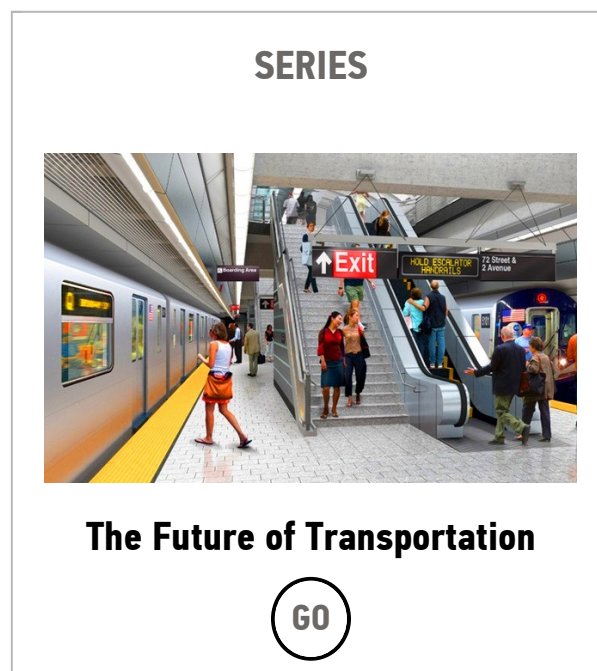
A friend of mine heads an office in the White House. I never see him anymore, except at the occasional black tie design dinner, where he is always good for a couple of gin and tonics as the crowd disperses. At the last such event, he asked me a question. Or maybe he didn't. But I answered it.

"What's the number one most important thing that we have to fight for?" I said. "You mean, besides corporations being people and money being speech?"

"Besides that."

"Well that's easy: 10-foot lanes instead of 12-foot lanes."

"Explain."



And so I did, brilliantly. So brilliantly that the White House issued an Executive Order the very next day. Or so I imagined; such is the power of gin.

Sobered by my now palpable failure, I have steeled myself for the task of explaining here, in a manner that can never be disputed or ignored, why the single best thing we can do for the health, wealth, and integrity of this great nation is to forbid the construction, ever again, of any traffic lane wider than 10 feet.

(Before beginning, let me thank the traffic engineers Paul Moore and Theodore Petritsch, who taught me most of this stuff. Yes, there are some good ones out there. This article borrows heavily from an article by Petritsch, "The Influence of Lane Widths on Safety and Capacity: A Summary of the Latest Findings.")

A little background: First, we are talking only about high-volume streets here. Neighborhood streets can have much narrower lanes. The classic American residential street has a 12-foot lane that handles traffic *in two directions*. And many busy streets in my hometown of Washington, D.C., have eight-foot lanes that function wonderfully. These are as safe and efficient as they are illegal in most of the United States, and we New Urbanists have written about them plenty before, and built more than a few. But what concerns us here are downtown streets, suburban arterials and collectors, and those other streets that are expected to handle a good amount of traffic, and are thus subject to the mandate of free flow.

Second, you should know that these streets used to be made up of 10-foot lanes. Many of them still exist, especially in older cities, where there is no room for anything larger. The success of these streets has had little impact on the traffic-engineering establishment, which, over the decades, has pushed the standard upward, almost nationwide, first to 11 feet, and then to 12. Now, in almost every place I work, I find that certain streets are held to a 12-foot standard, if not by the city, then by a state or a county department of transportation.

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**States and counties believe that wider lanes are safer. And in this belief, they are dead wrong.**

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In some cases, a state or county controls only a small number of downtown streets. In other cases, they control them all. In a typical city, like Cedar Rapids or Fort Lauderdale, the most important street or streets downtown are owned by the state. In Boise, every single downtown street is owned by the Ada County Highway District, an organization that, if it won't relinquish its streets to the city, should at least feel obliged to change its name. And states and counties almost always apply a 12-foot standard.

Why do they do this? Because they believe that wider lanes are safer. And in this belief, they are dead wrong. Or, to be more accurate, they are wrong, and thousands of Americans are dead.

They are wrong because of a fundamental error that underlies the practice of traffic engineering—and many other disciplines—an outright refusal to acknowledge that human behavior is impacted by its environment. This error applies to traffic planning, as state DOTs widen highways to reduce congestion, in complete ignorance of all the data proving that new lanes will be clogged by the new drivers that they invite. And it applies to safety planning, as traffic engineers, designing for the drunk who's texting at midnight, widen our city streets so that the things that drivers might hit are further away.

The logic is simple enough, and makes reasonable sense when applied to the design of high-speed roads. Think about your behavior when you enter a highway. If you are like me, you take note of the posted speed limit, set your cruise control for 5 m.p.h. above that limit, and you're good to go. We do this because we know that we will encounter a consistent environment free of impediments to high-speed travel. Traffic engineers know that we will behave this way, and that is why they design highways for speeds well above their posted speed limits.

Unfortunately, trained to expect this sort of behavior, highway engineers apply the same logic to the design of city streets, where people behave in an entirely different way. On city streets, most drivers ignore posted speed limits, and instead drive the speed at which they feel safe. That speed is set by the cues provided by the environment. Are there other cars near me? Is an intersection approaching? Can I see around that corner? Are there trees and buildings near the road? Are there people walking or biking nearby? And: How wide is my lane?

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**When lanes are built too wide, pedestrians are forced to walk further across streets on which cars are moving too fast and bikes don't fit.**

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All of these factors matter, and others, too. The simplest one to discuss, and probably the most impactful, is lane width. When lanes are built too wide, many bad things happen. In a sentence: pedestrians are forced to walk further across streets on which cars are moving too fast and bikes don't fit.

In the paragraphs that follow, I will lay out the evidence against 12-foot lanes, evidence compiled by traffic engineers, for traffic engineers. When presented with this evidence, DOT officials will face a mandate: provide conflicting evidence, or give in. In over a year of searching for conflicting evidence, I have failed to find any. The closest I came was the following conversation, with a DOT district commissioner in a western state, which I recorded faithfully within moments of it taking place:

"Yeah, you've got your studies that say that 10-foot lanes are safer than 12-foot lanes. But I've got a pile of studies *this* high," he insisted, waving at his hip, "that say the opposite."

"Wonderful," I said. "May I see them?"

"No. They're from the early days. I threw them out."

Emboldened by that exchange, I will again present the evidence at hand. First, we will investigate what the American Association of State Highway and Transportation Officials *Green Book*, the traffic engineers' bible, has to say on the subject. Then we will review the very few studies that compare crash statistics and driver speeds on lanes of different widths. These will allow us to draw some clear conclusions about safety.

### **Consulting the Green Book**

For traffic engineers, AASHTO is the keeper of the flame. Its "Green Book," the *Policy on Geometric Design of Highways and Streets*, is the primary source for determining whether a road design is an accepted practice. As such, it is useful in protecting engineers against lawsuits; if something is in the *Green Book*, it's "safe."

Given the protection it affords, nobody questions the *Green Book*. Never mind that very little of it is evidence-based, and that there are no footnotes justifying its pronouncements. I mean, does the Bible have footnotes?

Whether or not it reflects reality, the *Green Book's* position on lane widths is more than relevant, since the engineers need its blessing to modify a standard. Theodore Petritsch relates this position as follows:

For rural and urban arterials, lane widths may vary from 10 to 12 feet. 12-foot lanes should be used where practical on higher-speed, free-flowing, principal arterials. However, under interrupted-flow (signalized) conditions operating at lower speeds (35 MPH or less), narrower lane widths are normally quite adequate and have some advantages.

Here, the takeaway is clear: AASHTO says that 10-foot lanes are just fine—for what it's worth.

### **The Studies: Rare but Conclusive**

A number of studies have been completed that blame wider lanes for an epidemic of vehicular carnage. One of them, presented by Rutgers professor Robert Noland at the 80th annual meeting of the Transportation Research Board, determined that increased lane widths could be blamed for approximately 900 additional traffic fatalities per year. Unfortunately, Noland is a mere Ph.D. and not a practicing engineer. His evidence apparently didn't mean squat to the TRB. If you don't have short-sleeved white shirt and a pocket protector, you may as well stay home.

Happily, it turns out that engineers have conducted studies of their own. Two of these deserve our rapt attention. The first study, called "Effective Utilization of Street Width on Urban Arterials," was completed by the TRB itself. It found the following:

... all projects evaluated during the course of the study that consisted of lane widths exclusively of 10 feet or more [rather than 12 feet] resulted in accident rates that were either reduced or unchanged.

So far so good. A second study, called "Relationship of Lane Width to Safety for Urban and Suburban Arterials," was conducted by the conservative Midwest Research Center. Comparing 10- to 11-foot lanes to 12-foot lanes, it found:

A safety evaluation of lane widths for arterial roadway segments found no indication, except in limited cases, that the use of narrower lanes increases crash frequencies. The lane widths in the analyses conducted were generally either not statistically significant or indicated that narrower lanes were associated with lower rather than higher crash frequencies.

It is clear, then, that at the very least, 10-foot lanes cause no more accidents than 12-foot lanes, and may cause fewer. But what about the severity of these accidents, a subject on which these studies appear to be mute?

Here we can make use of another study and some common sense. We all know that people drive faster in wider lanes, but we need the engineers to say it. Fortunately, the Texas Transportation Institute, as old-school as they come, has done just that.

They state:

On suburban arterial straight sections away from a traffic signal, higher speeds should be expected with greater lane widths.

Granted, this study covers only one type of road, but there is no reason to expect opposite results on, for example, straight urban roads. The same logic would apply, although perhaps less dramatically: people drive faster when they have less fear of veering off track, so wider lanes invite higher speeds.

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**A pedestrian hit by a car traveling 30 m.p.h. is between seven and nine times as likely to be killed as one hit by a car traveling 20 m.p.h.**

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To conclude this radical thought experiment, we need to confirm another commonsense assumption, that higher-speed crashes cause more injuries and deaths than lower-speed crashes. This has been amply demonstrated to apply to all road users, especially pedestrians. According to a broad collection of studies, a pedestrian hit by a car traveling 30 m.p.h. at the time of impact is between seven and nine times as likely to be killed as one hit by a car traveling 20 m.p.h. This tremendously sharp upward fatality curve means that, at urban motoring speeds, every single mile per hour counts.



All of the above data, studies, and pronouncements, collected and disseminated by the mainstream traffic engineering establishment, point to the following conclusion: 10-foot lanes cause no more accidents than 12-foot lanes, and they may cause fewer. These accidents can be expected to be slower, and thus less deadly. Therefore, 10-foot lanes are safer than 12-foot lanes.

### **Protecting Capacity**

Before finishing, we need to investigate the carrying capacity of different width lanes, since traffic volume remains a legitimate concern. If safety were the only goal of traffic planning, all streets would be one-lane wide—or better yet, zero lanes wide. The fact that they are not means that we, as a society, are more than willing to sacrifice lives for automobility. So, what's the data?

Here, as again reported by Petritsch, a thorough literature search conducted by the Florida DOT yielded these findings:

The measured saturation flow rates are similar for lane widths between 10 feet and 12 feet. ... Thus, so long as all other geometric and traffic signalization conditions remain constant, there is no measurable decrease in urban street capacity when through lane widths are narrowed from 12 feet to 10 feet.

It is striking to hear this news from FDOT, the agency that may preside over the greatest pedestrian massacre in U.S. history. Four out of the five deadliest American cities for walking are currently in Florida. This is by design: in no other state has the DOT had such a powerful influence on the design of urban streets.

### **Pointing Fingers**

Alarmed by its horrifying safety ranking—and the barrage of resulting bad publicity—FDOT has taken bold measures to improve pedestrian safety. It released just last year a 44-page *Florida Pedestrian and Bicycle Strategic Safety Plan*.

Unfortunately, while this document talks plenty about such things as driver, cyclist, and pedestrian education, only two of its pages deal remotely with the real culprit, traffic engineering. Here, we are told that FDOT intends to "implement pedestrian and bicycle best practices," a phrase that is fairly meaningless without further definition.

To its credit, the plan advocates for the application of a "complete streets" policy to benefit cyclists and pedestrians. But such policies, as we have learned, make sure that some streets include bike lanes and sidewalks, but rarely require the dimensional properties that make them safe. Nowhere in the entire *Strategic Safety Plan* are lane widths discussed, or any other design feature of the roadway that might encourage deadly speeds.

In fact, you can learn all you need to know about this effort by glancing at the cover of the report, which is stamped with the project motto: "Alert Today, Alive Tomorrow." Think about that statement, and what it implies. In an encounter between a car and a pedestrian, whose life is at risk? Who, then, is expected to reform her behavior? Certainly not the driver—and most certainly not any engineers who endanger their populations with 12-foot lanes.

## **A Test Case**

I believe that FDOT—and every DOT—is capable of reform, but experience suggests that this will only happen when enough people make a stink. In Florida, we will be able to gauge the DOT's willingness to enter the reality-based community by how it responds to a proposal recently made to restripe Okeechobee Boulevard, a deadly state highway that cuts through downtown West Palm Beach. Its nine lanes separate the Palm Beach County Convention Center from everything that conventioners walk to, and are a nightmare to walk across or beside. These lanes, of course, are 12 feet wide.

Before and after drawings for Okeechobee Boulevard in West Palm Beach, Florida, show how narrowing 12-foot lanes to 10 feet creates ample room for protected bike lanes. (Image: Speck & Associates LLC)

What would happen if these lanes were reduced to 10-feet wide, as proposed? Three things. First, cars would drive more cautiously. Second, there would be roughly eight feet available on each side of the street for creating protected cycle lanes, buffered by solid curbs. Third, the presence of these bike lanes would make the sidewalks safer to walk along. All in all, an easy, relatively inexpensive win-win-win that DOT could fund tomorrow.

But will they? Only if they are capable of reform. Let's find out. The agency's bike and pedestrian coordinator, Billy Hattaway, is one of the good ones. But does he have the power to move FDOT to a 10-foot standard?

Moving beyond Florida, the task is clear. Our lives are currently being put at risk daily by fifty state DOTs and hundreds of county road commissions who mistakenly believe that high-speed street standards make our cities and towns safer. In my most considered opinion, these agencies have blood on their hands, and more than a little. There are many standards that they need to change, but the easiest and most important is probably the 12-foot lane. Armed with the facts, we can force this change. But only if we do it together.

It's time to push this discussion to its logical conclusion. Until conflicting evidence can be mustered, the burden of proof now rests with the DOTs. Until they can document otherwise, every urban 12-foot lane that is not narrowed to 10 feet represents a form of criminal negligence; every injury and death, perhaps avoidable, not avoided—by choice.

In the meantime, I welcome evidence to the contrary. We've shown them our studies; now let them show us theirs. Unless, of course, they've thrown them out.

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