London Traffic Would Be At Least 20 Percent Slower Without Congestion Pricing

By Charles Komanoff ▪ Illustrations by Joshua Murray ▪ Published December 14, 2017

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The number of *people* entering London's center each day has grown 23 percent since the start of congestion pricing, even as the number of *vehicles* entering fell 44 percent.

Traffic speeds have apparently reverted to their old crawl, however, prompting claims that congestion pricing is a failure. This analysis finds the contrary: it is a ringing success.

This article explains why, and concludes with implications for New York.

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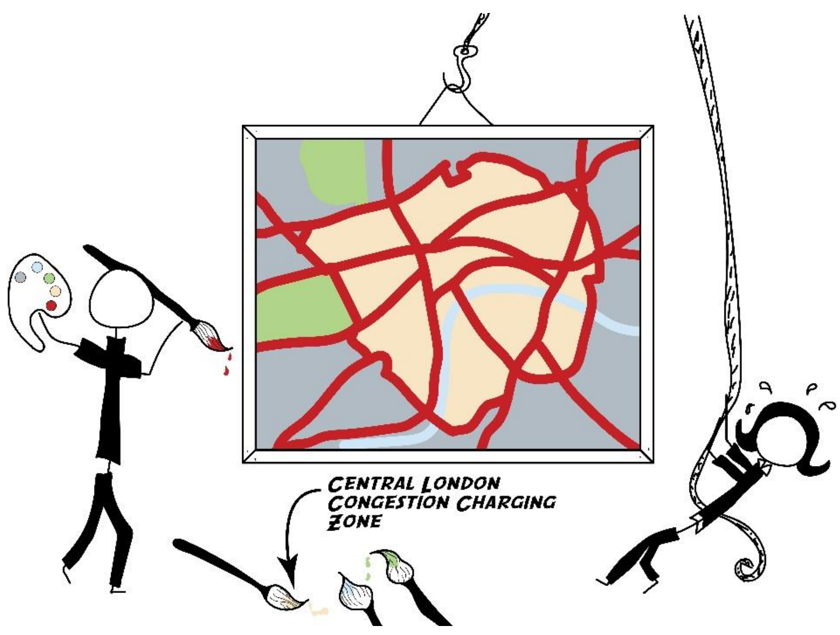
Introduction

Because of congestion charging, London has averted what would almost certainly have been a precipitous fall in travel speeds in that city's center over the past 15 years.

I reached this conclusion from analyzing commuting data compiled by Transport for London. TfL is the government agency responsible for London's entire transport system: roads, rail, buses, bikeways, hired vehicles, and the congestion charging program that began in early 2003.

London's population is the same as New York City's 8.5 million, and its 8 square mile Central Business District is the same size as Manhattan's CBD. Both cities are national centers of culture and commerce and home to millions of immigrants from every continent.



London and New York also share the distinction of being the world's iconic traditionally English-speaking megacities.

It's natural, then, that since the system's inception, New Yorkers have looked to London's congestion charging scheme as a possible template. Indeed, the tolls' success in cutting car

volumes and shortening commute times in London starting in 2003 inspired Mike Bloomberg to attempt to enact congestion pricing in New York City in 2007-2008.

In recent years, however, London travel speeds have drifted downward. Both official data and anecdotal evidence suggest that travel by car, cab or truck is now no faster than the pre-charging norm. (Data since 2006 are available in Fig. 6-5 of TfL's most recent annual report; different measurement conventions make it difficult to compare pre-charging speeds.)

This has bred suspicions that Gov. Andrew Cuomo's pending congestion pricing plan for New York City will function as a revenue-raiser that won't curb gridlock.

Of course, revenues raised from congestion pricing could be invested in modernizing mass transit. This would improve alternatives to driving, particularly into the Manhattan CBD, which is well served by subways. Nevertheless, the promise of quickly and permanently improving traffic flow is key to public acceptance of congestion pricing for New York.

What London Commute Data Reveal

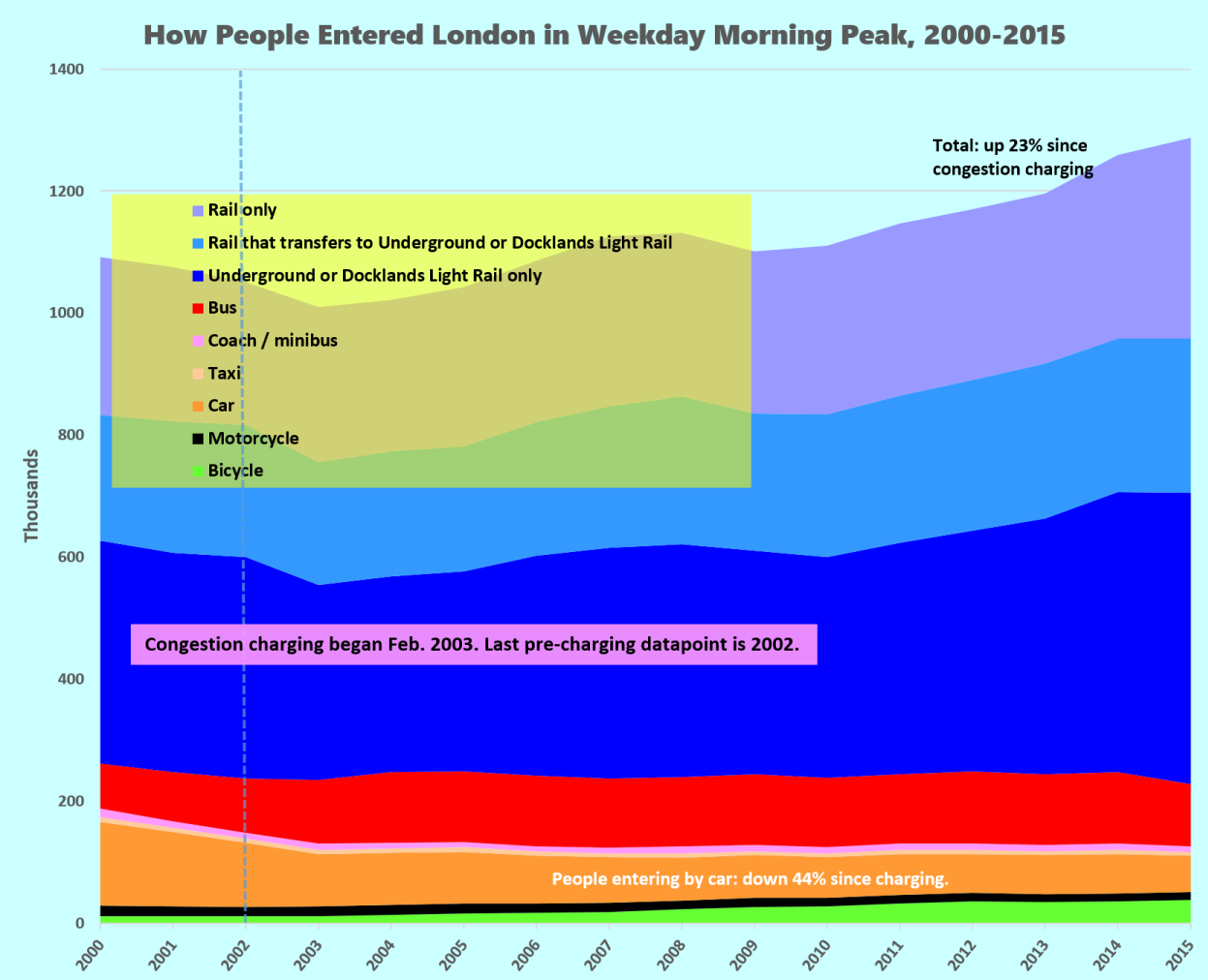
Those concerns led me to look into London commuter data since 2000 — a few years before congestion charging began in Feb. 2003. What if there was more to the London story than the recent reversion in travel speeds? What if many more people now travel into the center of the city? Shouldn't that count for something? And could that cast a fresh light on the travel-speed question?

Fortunately, Transport for London publishes annual counts of the numbers of people traveling into or through the London charging zone on a typical weekday morning. I compiled the data into the chart on the following page.

Here are key takeaways (comparing 2002 to 2015, the last year with available data):

- The number of people entering London's center each day in automobiles has plunged by 44 percent since the start of congestion charging, from 105,000 to 59,000.
- Nevertheless, the total number of people entering by all means combined grew from 1,050,000 to 1,287,000, for a net gain five times as great as the decline in car commuters, and an overall increase of 23 percent.

These two changes indicate a momentous shift in the relative proportions of people entering the heart of London by cars vis-à-vis those traveling by all other means. Prior to congestion



Graphic by Komanoff from TfL report, *Travel in London: Report 9* (2016), Table 7.1. From 2002 (the last pre-charging year) to 2015 (the last year with available data), the number of people entering London's center each day grew by 23 percent. The number entering in motor vehicles fell by 44 percent.

charging, that ratio was roughly 9 to 1 (nine people entering without a car for each person entering in a car). Today (in 2015), the ratio is a remarkable 21 to 1.

What Congestion Charging Accomplished in London

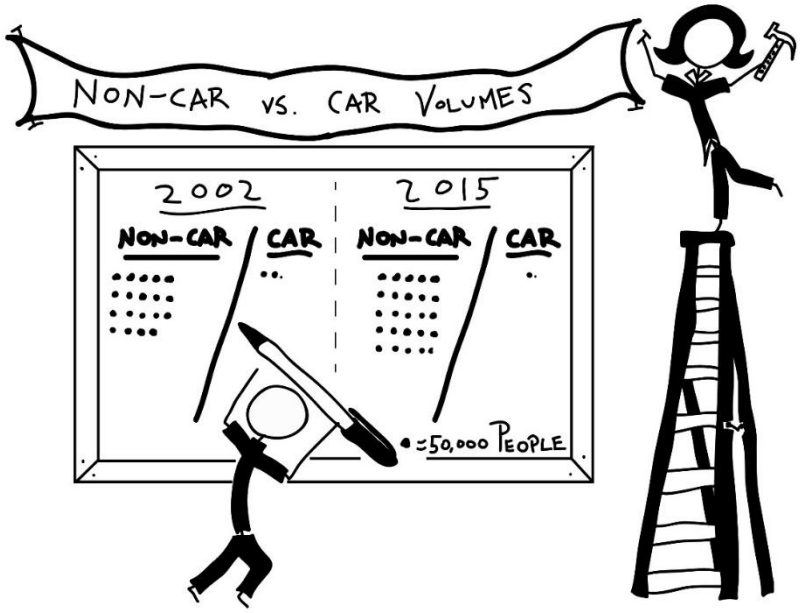
So how do I come to my conclusion that without the congestion charge, central London traffic would now be 20-30 percent slower than in the pre-2003 era?

My reasoning includes some math. But it mostly just follows a logical chain, the kind required to establish any *counterfactual* — a situation contrary to fact: I'm asking you to imagine London

without its congestion charge, but *with fewer traffic lanes in the charging zone and more people entering the heart of the city each day*.

Let's begin with the data point noted above: 43.8 percent fewer cars are now entering London's center than pre-2003.

This doesn't mean that traffic volumes in the charging zone are down 43.8 percent. That's because cars driven *into* the charging zone aren't the sole vehicles being driven *inside* the zone. I figure that prior to congestion charging, cars driven into the zone only accounted for a third of miles traveled there, with in-zone autos and commercial vehicles (vans, trucks, taxicabs) responsible for the remainder.



Those vehicles classes pay little or no congestion charge. Assuming their volumes stayed the same after the charge was imposed, the 43.8 percent decrease in auto *entries* equates to a 14 to 15 percent decline in overall in-zone vehicular *travel* (14-15% is a third of 43.8%).

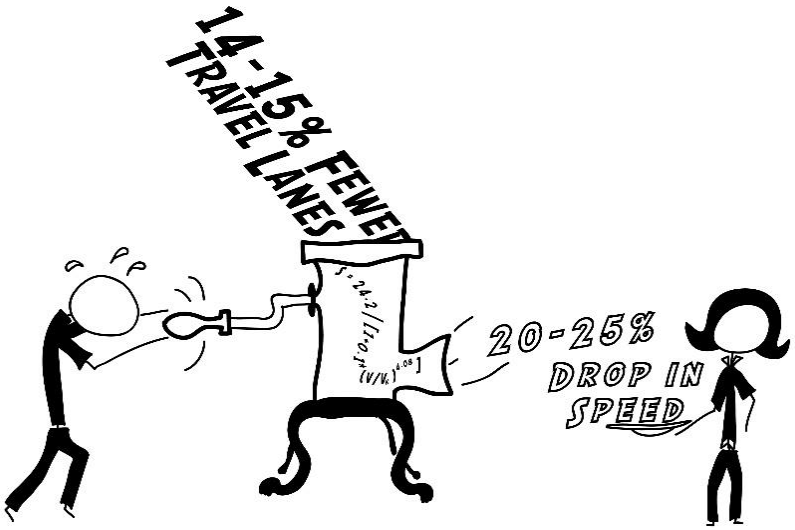
Let's now posit that central-London travel speeds in 2015 were the same as in 2002, as anecdotal evidence suggests. For that to happen, with a 14-15 percent drop in traffic volumes, road capacity in the zone would also have had to decline by around 14-15 percent. This stems from the fundamental traffic principle that vehicle speeds are a function of the relationship between road capacity and road volume. My "shrinkage hypothesis" also jibes with the addition in recent years of bus lanes, bike lanes, public plazas and civil works like pedestrianized streets throughout the central charging zone.

Our counterfactual then becomes: *how far would London travel speeds have dropped if road capacity shrank by 14-15 percent (which evidently happened) while traffic volumes stayed the same (which definitely did not)?*

I believe I have a way to answer that question. It draws on the "speed-volume" equation in my "BTA" spreadsheet model.

Briefly, that equation predicts the drop in travel speeds in Manhattan for any number of travel lanes removed from general circulation. For a 14-15 percent removal, it predicts a 22 percent drop in CBD vehicle speeds. Let's call it a 20-25 percent drop.

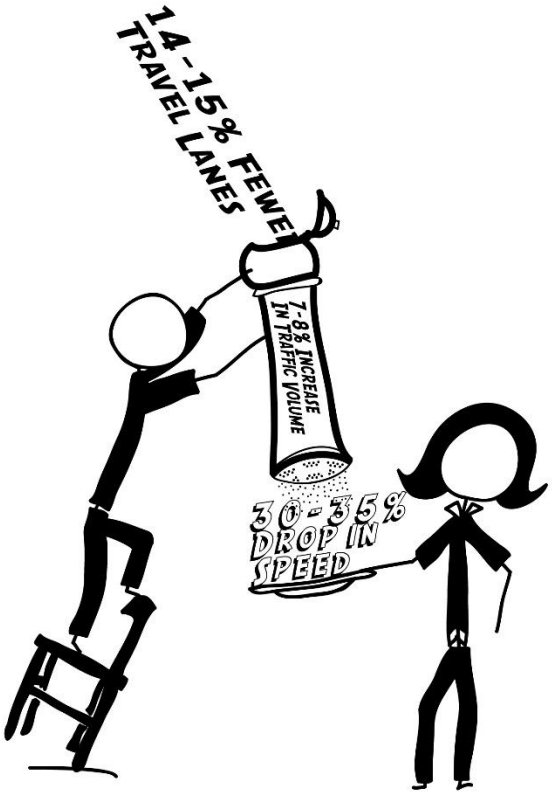
(The actual calculation is somewhat more complex than suggested by the equation on the food grinder at left, since we have to take into account the pendulum swing by which some car trips that have lost their utility due to the lower speeds would return to the roads due to the initial drop in traffic volumes.)



It's true that this result is based on a model developed for Manhattan, not London. Nevertheless, the similarities between the cities and the general universality of the principle underlying the speed-volume equation argue for applying the Manhattan result to London.

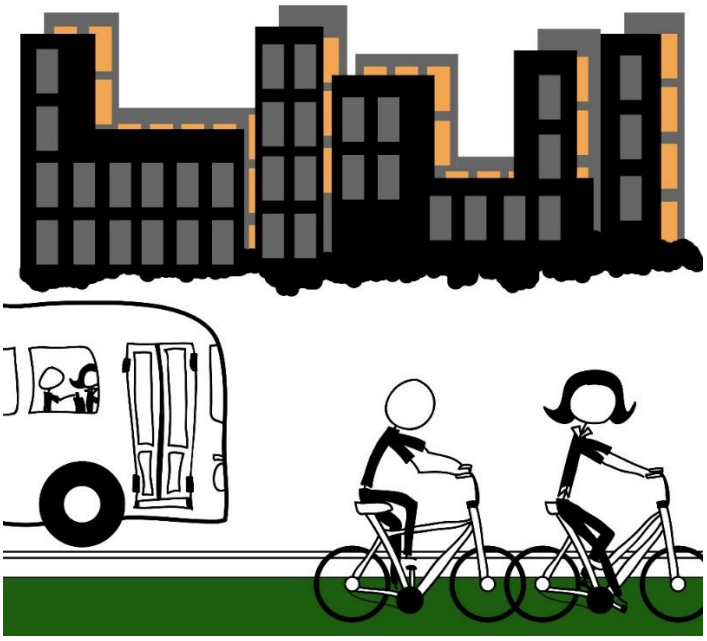
Moreover, that result — a 20-25 percent drop in travel speeds without congestion charging — is probably an *underestimate* because many more people (23 percent more) are now traveling to London's heart than before the congestion charge.

This inspires a second counterfactual on top of the first: What if, at the same time the number of travel lanes in the charging zone was shrinking by 14 to 15 percent, *the number of cars entering the zone had increased in the same proportion as the total number of people traveling into the zone, i.e., by 23 percent?*



Keeping in mind our assumption that two-thirds of traffic in the center of London is probably in-zone autos and commercial vehicles, a 23 percent increase in the number of autos traveling into the zone would probably have equated to a 7-8 percent increase in overall traffic volumes in the center of London (7 to 8 percent being one-third of 23 percent).

When I crank additional traffic volumes of 7 to 8 percent into my speed-volume equation alongside the assumed 14-15 percent reduction in the number of travel lanes, it calculates that *speeds would have fallen more than 30 percent*.



Depending upon the counterfactual chosen, **if not for congestion charging, central London travel speeds would now be at least one-fifth and perhaps one-third less than actual**.

In New York, the costs in lost time from such a slowdown would be on the order of a billion dollars a year, according to my BTA model. London, a city as wealthy as New York, would almost certainly have been saddled with similar costs, had it not adopted congestion charging to thin traffic volumes at the same time it was reconfiguring its roads with fewer driving lanes.

To sum up:

Q: Are motor vehicles moving faster in the heart of London than they did before congestion charging?

A: Evidently not. But the combination of congestion charging, reconfigured road space and transit expansion is enabling London to absorb more than a 20 percent increase in central-London commuting, without skipping a beat.

That's no small feat.

Ride-Hail Services in London . . . and New York

As noted, TfL travel data available for this paper end with 2015, the moment at which ride-hail services such as Uber began taking hold in London and elsewhere. Growth in for-hire vehicles

may be contributing to further recent deterioration in travel speeds within the London charging zone. Indeed, insofar as FHV's are exempt from the congestion charge and, in addition, aren't surcharged for travel within the zone, it would be surprising if that were not the case.

The likelihood that exempt FHV's are worsening travel speeds in the heart of London points to the need to ensure that the forthcoming congestion pricing program for New York — details of which are expected as early as January, 2018 — includes robust charges for both new app-based services such as Uber and Lyft and traditional yellow (medallion) taxicabs.

Such surcharges can not only provide parity with private autos; they can also discourage for-hire vehicles from re-occupying the road space "cleared out" by the prospective cordon toll on cars and trucks.

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To see calculations: *Download the BTA spreadsheet (xls). In* ***Results*** *tab, use pull-down menu attached to Cell I25 to switch to Baseline scenario. In* ***User Inputs*** *tab, set Cell 162 (street space repurposed from autos) to 132 lane-miles (that's 14.6% of the CBD's 907 lane-miles). Now, back in* ***Results****, see that the big blue box at Cell B13 shows a change in travel speed of negative 21.6%. (That result takes into account that some car trips that have lost their utility for their drivers would disappear.) Procedure is same for second analysis with assumed 7-8 percent rise in volume, except that effective decrease in road capacity would have been 22%, or 200 lane-miles. Inputting that in* ***User Inputs*** *yields a negative 32.4% change in travel speeds. NB: the BTA changes continually w/ new data, so results at later date may vary.*

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Note: A briefer version of this story without illustrations was published in Streetsblog on Dec. 5, 2017, as London Traffic Would Be At Least 20 Percent Slower Without Congestion Pricing.

About the authors

Charles Komanoff is a veteran policy analyst based in Lower Manhattan.

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