VICTORIA Transport Policy INSTITUTE
EFFICIENCY • EQUITY • CLARITY

www.vtpi.org
Info@vtpi.org
250-508-5150

Toward More Accurate and Responsive Congestion Costing

Commonly cited congestion cost estimates are inaccurate. This can bias planning decisions to overinvest in roadway expansions, and fails to respond to traveler demands for affordability, cost efficiency and safety. Let's investigate.

4 January 2026

By Todd Litman,

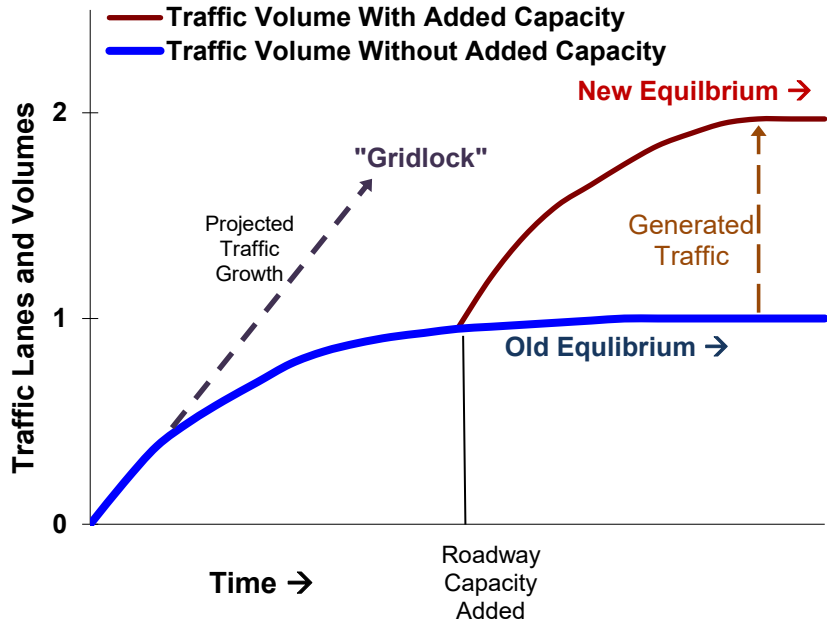
Draft Planetizen Blog

Comments welcome (litman@vtpi.org)

Is traffic congestion a major problem? How should cities respond? What trade-offs should we consider when evaluating potential congestion reduction strategies.

The answers are changing as we better understand congestion dynamics. Planners previously treated traffic as a fluid that flows through a road system, but we now know that it behaves more like a gas that fills available roadspace and can be condensed with appropriate incentives. In the past, future congestion problems were often predicted by simply extrapolating past traffic growth, ignoring its tendency to self-limit: congestion increases until delays cause some travellers to avoid peak-period vehicle trips, achieving equilibrium as illustrated below.

Figure 1 **Traffic Growth and Congestion Equilibrium**



Traffic grows when roads are uncongested, but growth rates decline as congestion limits peak-period vehicle trips, creating a self-limiting equilibrium (indicated by the curve becoming horizontal). Extrapolating past growth trends without considering these effects exaggerates future congestion problems. If capacity increases, traffic grows until congestion returns, resulting in a new equilibrium with more total traffic. The congestion equilibrium depends on the quality of alternatives, such as public transit comfort, speed and affordability, and TDM incentives such as road and parking pricing, flextime and telework.

The level of congestion equilibrium depends on the quality of alternatives and TDM incentives: if alternatives are inconvenient and expensive, congestion becomes severe, measured as level-of-service (LOS) E or F, before enough trips shift, but if cities offer attractive non-auto travel options and rewards for using them travellers will more easily reduce peak period driving; congestion does not disappear but is less severe, hovering at a tolerable LOS C or D. For example, in recent years, better mobility substitutes (telecommunications and delivery services that substitute for out-of-home travel) significantly reduced peak-period vehicle travel and congestion, and a combination of efficient tolls and non-auto mode improvements have significantly reduced congestion in London and Stockholm, and recently New York.

Travellers respond to congestion like sailors to tides: they adjust trips to avoid peak-period driving, shifting time, mode and destination to minimize delays. Of course, traffic congestion is frustrating and wasteful, but misguided solutions are even more harmful. Expanding urban roadways is expensive, typically costing $10-65 million per lane-mile, or $1.40 to $2.50 per additional peak-period vehicle-mile. It is also inefficient since a major portion of the added capacity soon fills with induced vehicle travel, and unfair since current funding forces non-users to subsidize roadway costs. Wider roads with higher traffic speeds degrade other non-auto travel, called the barrier effect, and encourage sprawl which reduces accessibility overall.

The table below compares old and new approaches to evaluating traffic congestion.

Congestion Evaluation Paradigm

Old	New
The planning goal is to move vehicles faster.	The goal is to maximize accessibility and maximize transportation system efficiency.
Traffic is like a liquid flowing through streets.	Traffic is like a gas that expands and contracts to available space.
Traffic growth can result in "gridlock."	Congestion is self-limiting. Reducing congestion requires reducing the point of congestion equilibrium.
Measured by congestion intensity.	Measured by per-capita delays or door-to-door travel times.
Evaluated by freeflow baseline speeds although they generally exceed what is legal, safe and efficient.	Evaluated by traffic and efficiency-optimizing baseline speeds which maximize overall value.
Roadway expansions reduce congestion and benefit everybody.	Roadway expansions provide limited benefits, induce more vehicle travel which increases many costs, and are unfair.
Motorists are victims of congestion.	Motorists also cause congestion.

The old paradigm exaggerates congestion costs and roadway expansion benefits. The new paradigm provides more realistic estimates of congestion costs and better guidance for evaluating solutions.

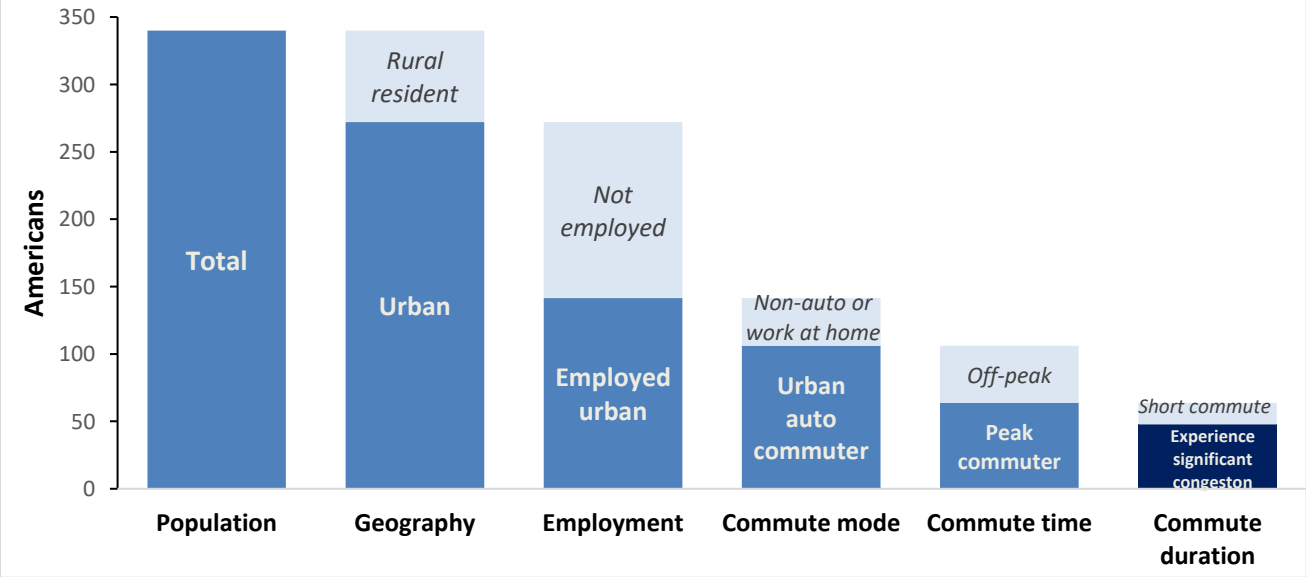
This is a timely issue. Congestion concerns affect many planning decisions, from urban design to transportation infrastructure investments to road and parking pricing; a better understanding of congestion impacts can guide these decisions to better outcomes.

What does congestion really cost?

Industry-sponsored studies produce high traffic congestion cost estimates. For example, the *Urban Mobility Report (UMR)* estimates that US annual congestion costs total $269 billion averaging $1,480 per motorist, the *Global Traffic Scorecard (GTS)* estimates that it costs $86 billion, averaging $894 per motorists, and the *Cost of Congestion to the Trucking Industry* claims that it cost truckers $109 billion. The FHWA's *Urban Congestion Trends* reports summarize these studies. Are these estimates realistic? Let's pull back the curtain to see these studies' methods, assumptions and biases.

The UMR states that "Americans lost an average of 63 hours sitting in traffic in 2024," but this exaggerates. Approximately 20% of Americans are rural residents, 48% are not employed (youths, retirees, looking for work, etc.), 25% of commuters use non-auto modes or work at home, 40% travel off-peak, and 25% of commutes are under 15 minutes, indicating that less than 15% of all Americans and 27% of all workers experience significant commute delays, as illustrated below. Of course, motorists face non-commute congestion, so Americans probably average 15-20 annual hours of congestion delay, but that time is not really lost, drivers spent it relaxing, thinking and listening to music or podcasts in the comfort of their vehicles.

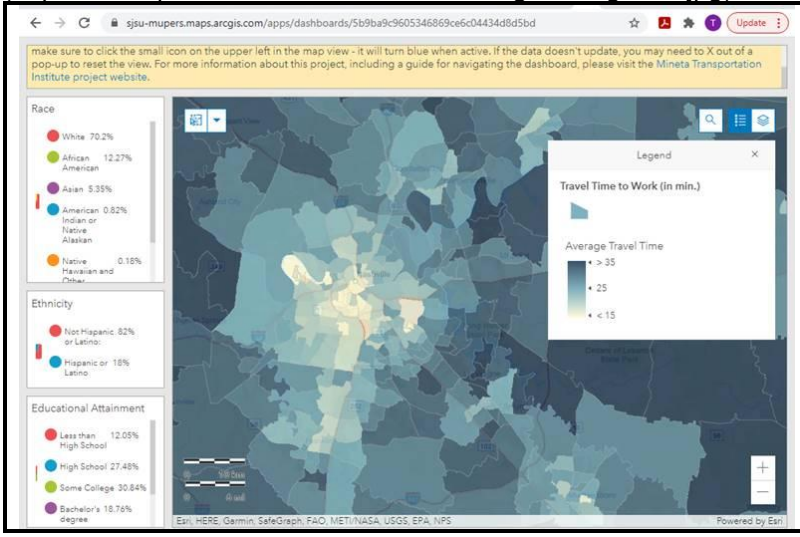
Figure 2 **Realistic Portion of Americans Exposed to Congestion**



The UMR claims that Americans lose 63 annual hours sitting in traffic, but that is inaccurate. Considering the portions that are rural, not employed, use non-auto modes, work at home, commute off-peak or have short commutes (less than 15 minutes), only about 50 million people representing about 15% of all Americans and 27% of all commuters regularly experience significant congestion.

Let's put these delays into perspective. Most people travel about 70 daily minutes or 400 annual hours, so 15-20 annual delay hours increases total travel times 3-5%, which is less than the additional time that drivers spend chauffeuring non-drivers or the additional commute time for urban fringe compared with central neighborhood residents, as illustrated below.

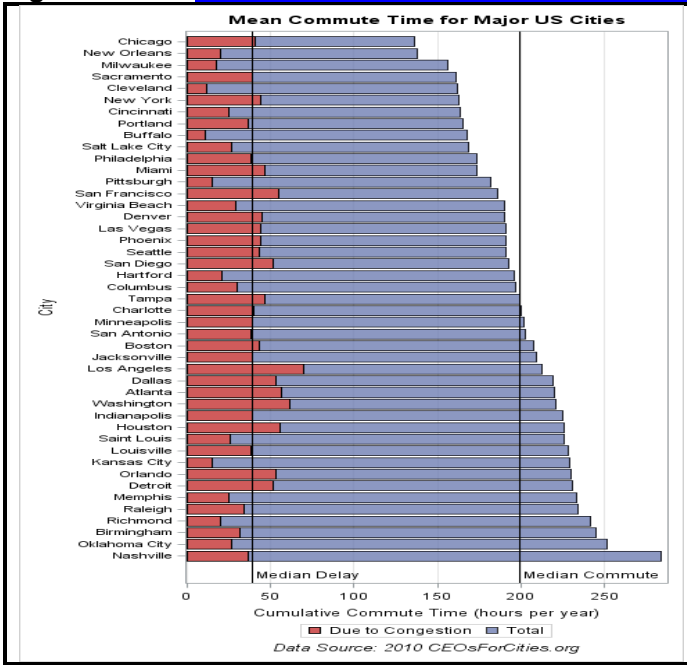
Figure 3 **Mineta Transportation Institute Commute Duration Dashboard**
(https://www.planetizen.com/files/inline-images/image001.jpg)



Central neighborhood workers spend less than 20 minutes per trip or 147 annual hours commuting to work, compared with more than 220 annual hours for urban fringe residents.

The following graph compares congestion delay and total commute durations delays for US cities. Compact and multimodal cities such as Chicago, New York and San Francisco have more delay but quicker commutes due to shorter trip distances, while sprawled, auto dependent cities such as Atlanta, Houston and Oklahoma City have less severe congestion but longer commutes due to more total driving. This indicates that congestion delays are a small portion of total travel time costs and living in a central, multimodal neighborhood provides much larger travel time savings than most roadway capacity expansion strategies.

Figure 4 **Visualizing US Congestion Delays and Commute Durations**



Compact cities such as Chicago, New York and San Francisco tend to have more congestion delay hours, but shorter commute durations than sprawled, automobile-dependent cities such as Atlanta, Houston and Oklahoma City, because residents drive less.

Some congestion reduction strategies, such as roadway expansions, tend to increase commute durations and total travel times and costs by inducing more vehicle travel and increasing sprawl, while others, such as improving space-efficient modes and more compact development increase accessibility and reduce total travel times.

How are congestion costs calculated?

Congestion delays are calculated by comparing peak-period traffic speeds with *baseline speeds* that are considered optimal. The following table describes four types. Most economists recommend capacity or efficiency optimizing baselines since they maximize value and safety. A practical way to calculate this recommended by Transport Canada is to calculate congestion costs based on 50%, 60% and 70% below freeflow speeds for sensitivity analysis.

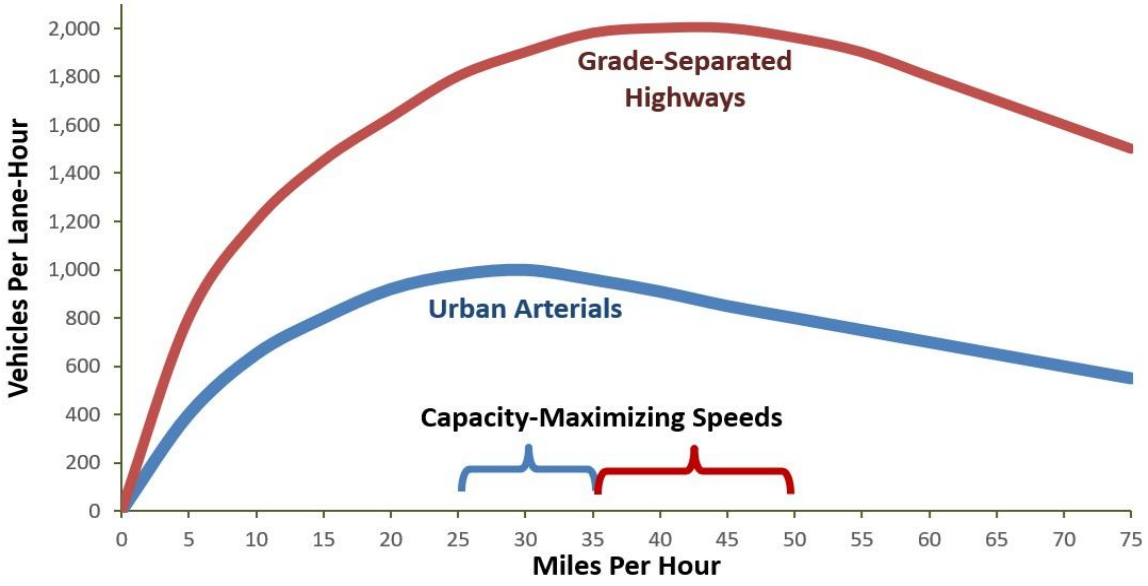
Baseline Speeds for Congestion Analysis

Definition	Levels of Service	Typical Speeds
Freeflow – off-peak traffic speeds	A-B	5-15% over speed limits.
Legal speed limits – Maximum speeds defined by law.	B-C	30-50 mph on urban arterials and 55-70 mph on urban highways.
Traffic optimizing – speeds that maximize traffic capacity, cost efficiency and safety.	C-D	25-35 mph on urban arterials and at 35-50 mph on grade-separated highways, illustrated below.
Economic efficiency – speeds that reflect travel demands and maximize benefits.	Varies. A-B for urgent trips, C-D for most trips.	Varies. Typically, 10-30% of motorists are willing to pay cost-recovery tolls for uncongested travel.

Baselines define the speeds considered optimal. Which is used significantly affects analysis results.

The figure below shows how traffic speeds affect traffic flow. Moderate speeds maximize road capacity and therefore cost efficiency (vehicle flow per investment dollar).

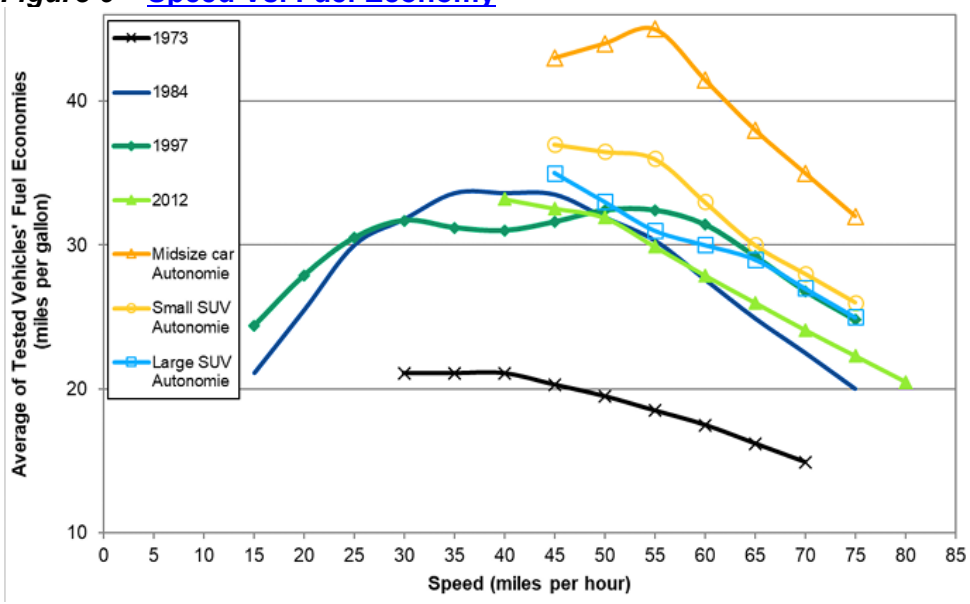
Figure 5 **Traffic Speed Versus Capacity**



Since faster traffic requires more shy distance (separation) between vehicles, roadway capacity declines as speeds increase. Under optimal (dry, clear and level) conditions capacity typically peaks at 25-35 mph (40-60 kph) on urban arterials and 35-50 mph (60-80 kph) on grade-separated highways, reflecting LOS C-D. Capacity-optimizing highway speeds tend to be lower in urban areas due to more interchanges and denser traffic.

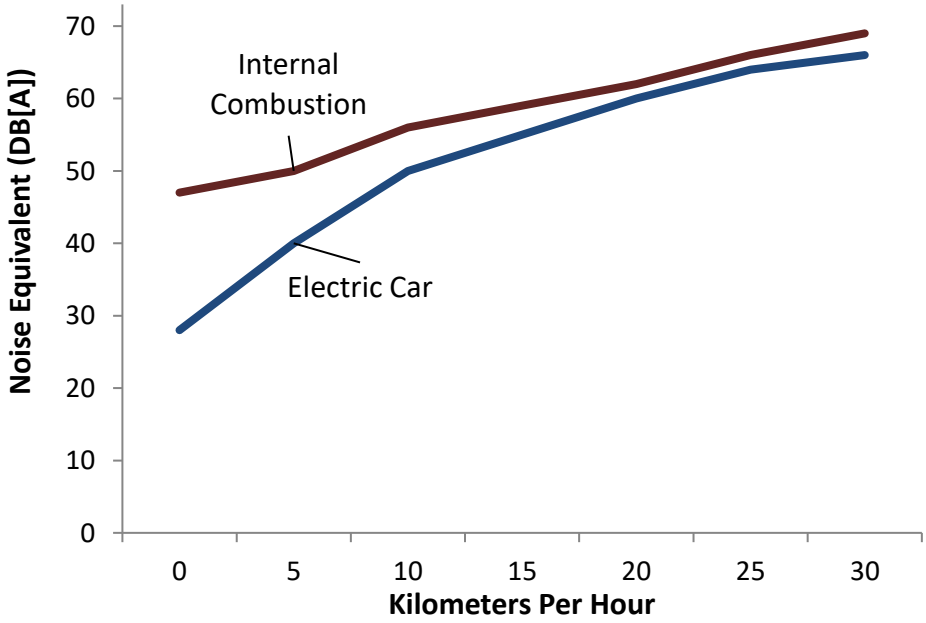
High traffic speeds also increase risk by reducing drivers' ability to react to dangers and increasing crash severity: each additional 1 kph typically increases severe injury rates 3%. Higher speeds also increase fuel consumption, emissions and traffic noise, as illustrated below.

Figure 6 **Speed Vs. Fuel Economy**



Vehicle fuel economy tends to peak at 40-50 mph and declines at higher speeds.

Figure 7 **Noise Versus Speeds**

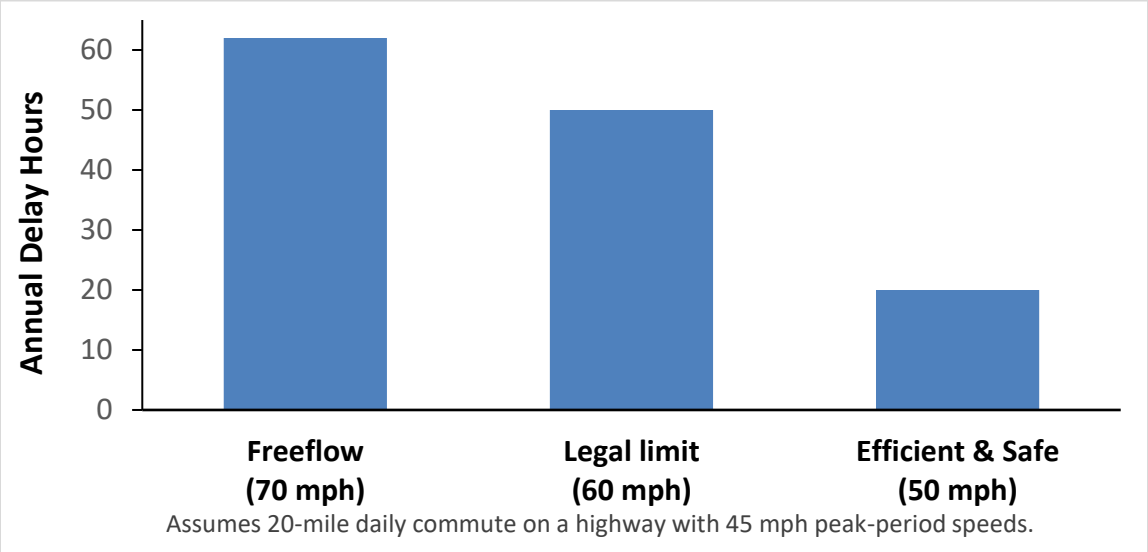


Vehicle noise increases with speed. Although electric cars produce less noise than internal combustion engines (ICEs), the differences decline with speed over 20 kph, as tire and wind noises increase.

The UMR, GTS and ATRI calculate congestion costs using freeflow baseline speeds although they exceed what is legal, safe and efficient. They assume that speeding is desirable and reductions to safe and efficient speeds is a "cost." The UMR caps freeflow speeds at 65 mph, although this exceeds legal limits on many urban freeways and all arterials. The ATRI has no cap, ignoring the substantial risks caused by trucks exceeding speed limits. This means that a major portion of what the UMR, GTS and ATRI call *congestion costs* are actually *traffic speed compliance*: drivers slowing to legal and safe speeds. This should be considered a benefit rather than a cost.

The following graph shows how baseline speed selection affects delay estimates; freeflow baselines result in about 20% higher estimates than legal limits, and three times those based on efficient and safe speeds.

Figure 8 **Estimated Delay Using Different Baseline Speeds**

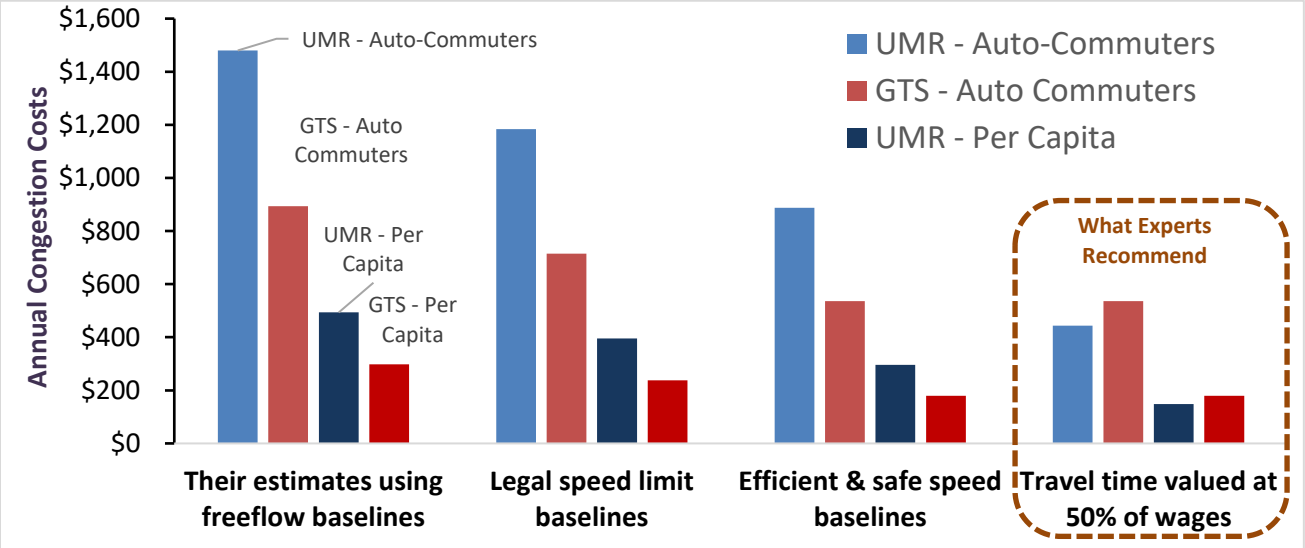


Freeflow and legal limit baseline speeds result in much higher estimated delay hours than the efficient and safe speed baseline that most economists recommend.

Congestion costs are calculated by multiplying delay hours by travel time values. Most experts, and the USDOT, recommend using 50% of average wages or less, but the UMR uses twice that value, over $24 per hour. Similarly, although the Bureau of Labor Statistics reports that truck driver wages average $20 to $26 per hour, the UMR uses $34 per hour. These values are much higher than what most motorists are actually willing to pay to avoid delays for most trips.

By using higher baseline speeds and travel time values than experts recommend these studies exaggerate congestion costs as illustrated in the following graph. For example, the UMR estimates that congestion costs $1,480 per motorist and $269 billion in total, but these decline to $444 per motorist and $81 billion in total using recommended baseline and time values. Similarly, the GTS's cost estimates declines from $894 per motorist and $85 billion in total to $536 per motorist and $51 billion in total using realistic values.

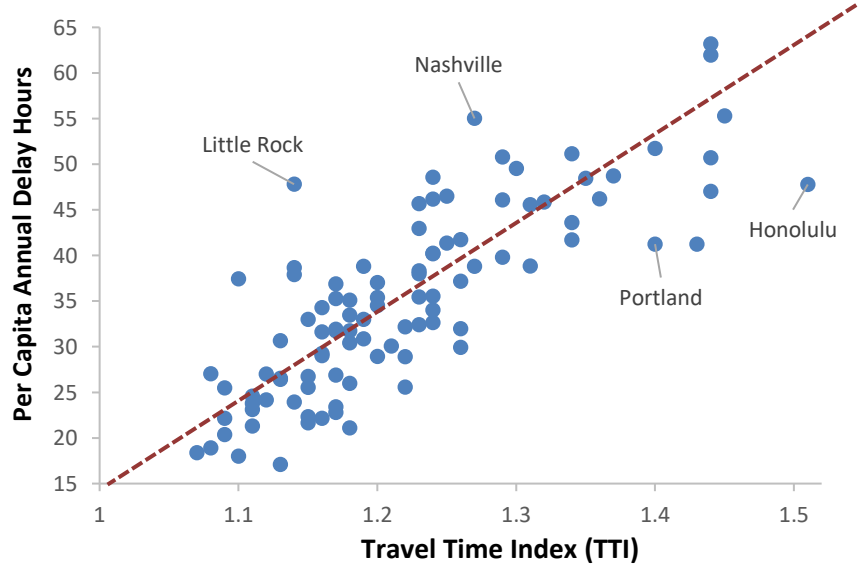
Figure 9 **Comparing Estimated Congestion Cost**



The Urban Mobility Report (UMR) and the Global Traffic Scorecard (GTS) both use freeflow baseline speeds and the UMR values travel time twice as high as experts recommend. More realistic baseline speeds and travel time values result in much lower congestion cost estimates.

The UMR reports Travel Time Index (TTI) values, an indicator of congestion intensity, hours of delay and monetized congestion costs. There are large disparities between these indicators as indicated in the following graph. Motorists tend to experience more intense congestion in compact cities, but residents experience less congestion delay because they drive less. Intensity indicators may be useful for short-term decisions such as when and how to make a cross-town trip, but long-term planning decisions should be based on per capita congestion costs.

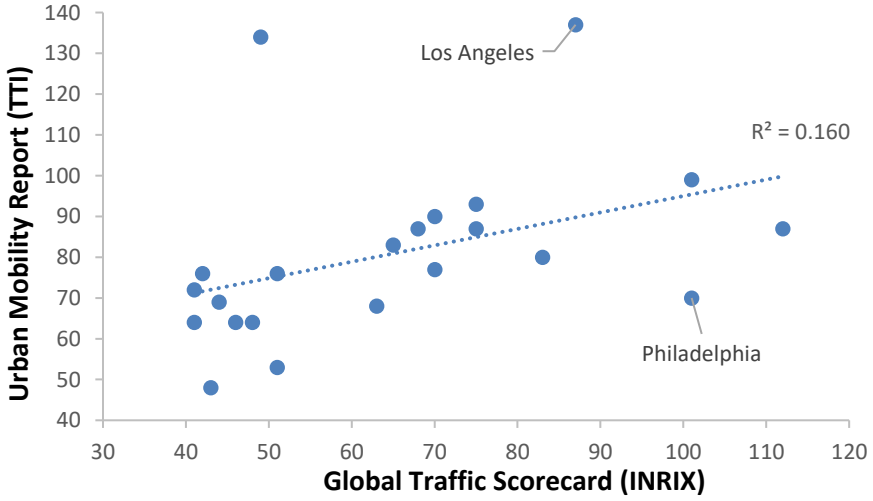
Figure 10 **Travel Time Index Versus Congestion Delay Hours** (UMR)



There are discrepancies between congestion indicators. Sprawled cities such as Little Rock and Nashville have low Travel Time Index (TTI) values indicating less intense congestion, but high per capita delay hours because residents must drive more, while compact, multimodal cities like Portland and Honolulu have high TTI ratings but less per capita delay hours because residents drive less.

These studies have other methodological problems. For example, although both use the same analysis methods and traffic speed data their results vary widely, as illustrated in the following graph. The low R^2 value indicates a weak statistical relationship. There is no obvious pattern to these differences. For example, for Los Angeles the UMR reports far higher delay hours (136) than the GTS (87), but for Philadelphia it reports far lower (70 versus 101) delay hours. Similarly, the UMR estimates that annual truck congestion costs total $36 billion but the ATRI estimates a very precise $108.8 billion. These inconsistencies indicate that study results are unreliable.

Figure 11 **UMR vs GTS Annual Delay Estimates** (URL and GTS)



Although the UMR and GTS use the same methods and source data their congestion delay estimates are very different, indicated by a low 0.160 R^2 value. There is no obvious explanation to these discrepancies. This suggests that their results are unreliable.

Both report congestion costs per motorist rather than per capita, which ignores how *exposure*, the amount that residents must drive, affects congestion costs. For example, the UMR ranks New York third in delay *per motorist* but 17th in delay *per capita*, and Washington DC ranks 7th in *per motorist* delay but 24th in *per capita* delay because those cities are compact and multimodal. The GTS rates Chicago as having the highest per motorist delay, but the UMR rates it third for delay per motorist and 12th for delay per capita. Per capita annual delay hours are much higher in sprawled, auto-dependent regions such as San Bernadino (63), Miami (55) and Nashville (55) than in larger but compact and multimodal cities such as Chicago (49), New York (47), and Washington DC (46). This indicates that, although congestion intensity and delay tend to increase with region size and density, these effects can be offset by high quality transit and compact development which can reduce congestion exposure by reducing the amount residents must drive under peak conditions.

These studies fail to provide information needed to understand these discrepancies or allow results to be replicated. Although the UMR is published by the University of Texas it does not reflect academic research practices; it lacks comprehensive literature reviews, does not discuss potential uncertainties and biases, and is not peer reviewed. It bases its travel time values on a forty years old source and does not explain why these are double USDOT recommendations.

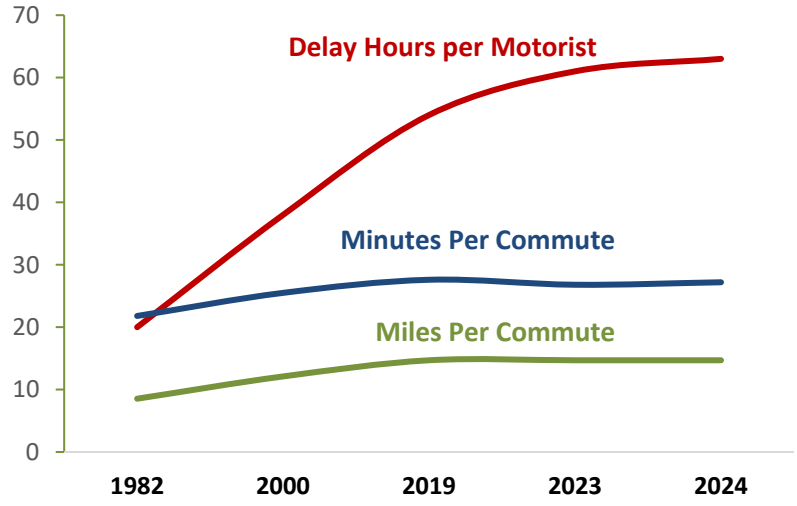
Is traffic congestion really getting worse?

The UMR, GTS and ATRI reports all claim that traffic congestion problems are increasing. For example, the UMR shows the following trend indicating that annual delay hours per motorist have increased significantly over time. Most readers would probably assume that this means that traffic speeds are decreasing, but that is a misinterpretation.

Because these studies measure congestion based on differentials between peak and off-peak traffic speeds, increases in off-peak freeflow speeds increase the Travel Time Index (TTI) and Delay Hours. For example, if peak period traffic speeds averages 50 mph but off-peak freeflow speeds increased from 55 mph in 1982 to 65 mph in 2024, the Travel Time Index would increase from 1.1 to 1.3 and congestion delay hours would triple, not because rush hour speeds declined but because freeflow speeds increased. Several factors increased urban freeflow traffic speeds during the last few decades including higher speed limits (the 1974 national 55 mph speed limit was rescinded in 1995, subsequently speed limits increased on most highways), higher roadway design speeds, larger and more powerful vehicles, declining real fuel prices, and reduced speed enforcement.

This appears to be what has happened, as illustrated below. The UMR estimates that between 1980 and 2020 annual delay hours per motorist approximately tripled, but minutes per commute increased little and that can be explained by suburbanization which increased average commute distance increased about 38%, from about 8.6 miles in 1980 to more than 12 in 2020.

Figure 12 **Motorists' Delay Hours Versus Commute Duration** (UMR and Census Data)



Congestion cost studies indicate that annual delay hours per motorist increased significantly over time, but commute duration has not.

Because congestion costs are calculated based on the difference between peak and off-peak traffic speeds, increased congestion costs do not necessarily indicate that peak period speeds decline, more likely they indicate that off-peak freeflow speeds increased, meaning that traffic is actually faster not slower.

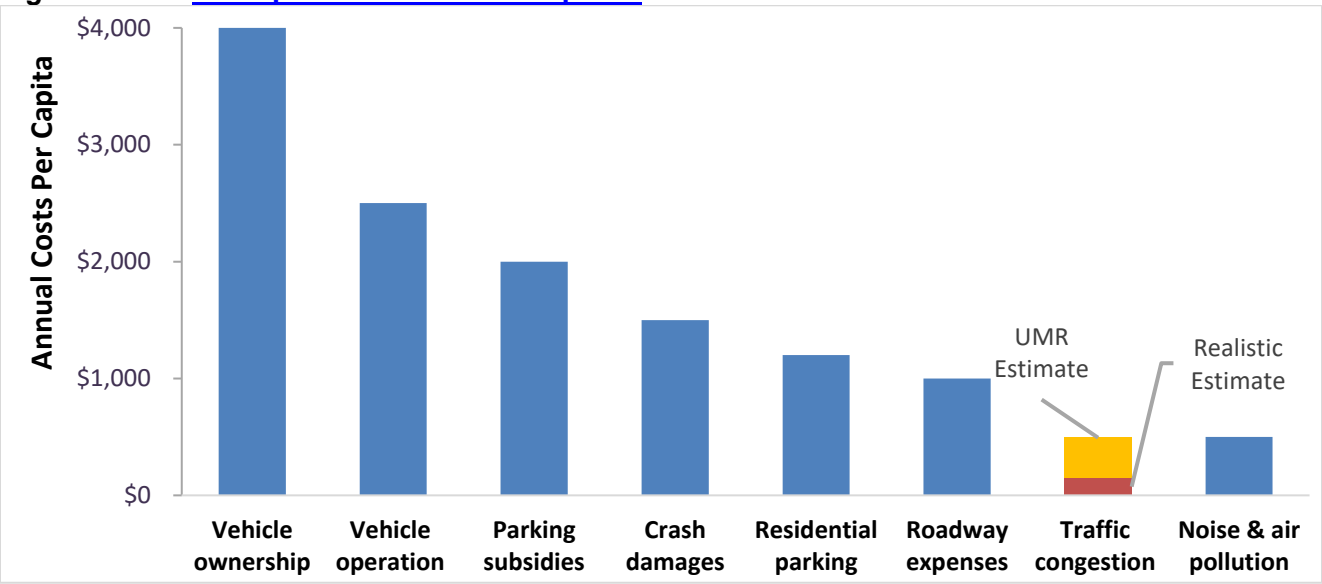
This indicates that, contrary to what congestion cost reports claim, their results do not really show congestion is growing and reducing traffic speeds. Most or all reported growth in Travel Time Index ratings, delay hours and congestion costs result from faster freeflow speeds rather than slower peak-period speeds caused by congestion.

What harm results from overestimating congestion costs?

Transportation planning decisions often involve trade-offs between congestion reduction and other planning goals such as affordability, safety, and between roadway expansions and other congestion reduction strategies. For example, as previously mentioned, wider roads and increased vehicle traffic tend to degrade walking conditions, and since most transit trips including walking links, this also reduces transit accessibility. As a result, overestimating congestion costs and roadway expansion benefits tends to reduce non-auto travel.

The graph below compares various transportation costs. Congestion is relatively modest overall, indicating that a congestion reduction strategy is not cost effective if it significantly increases other costs, but is far more beneficial if it reduces them.

Figure 13 **Transportation Costs Compared**



Per capita annual congestion costs range from approximately $150 (realistic estimate) up to $500 (UMR estimate) depending on assumptions. This is modest compared with total vehicle costs.

These harms are particularly large if urban roadway expansions induce more vehicle travel, increasing external costs including downstream traffic and parking congestion, crash risk, pollution emissions and sprawl-related costs. It is also unfair to non-drivers who experience less mobility and bear more external costs – more traffic risks, noise and pollution – and because current funding practices force non-users to subsidize road and parking facility costs.

Comprehensive planning that recognizes these impacts tends to favor win-win strategies that help achieve multiple community goals, for example, choosing the congestion reduction strategies that also improve affordable and resource-efficient modes, reward travellers who reduce peak-period driving, and create more compact, multimodal communities where is easy to get around without driving.

How does congestion affect accessibility?

Traditional planning evaluates transportation performance using *mobility* indicators such as roadway level-of-service, the Travel Time Index and congestion delay hours. New planning uses *accessibility* indicators such as the number of services reachable in 15-minute, the number of jobs reachable in 30 minute, and total time and money people must devote to basic transportation. Accessibility-based analysis allows us to focus on our ultimate goal: helping people reach what they want, rather than moving vehicles.

The UMR reflects old, mobility-based analysis. In response to criticism, the 2025 edition includes a new section called *Observed Destination Access* that claims to evaluate accessibility using indicators such as Total Urban Coverage (TUC) which measures the portion of a region motorists can drive to in 30 minutes. This is a terrible indicator: it is not multimodal, it does not measure access to services and jobs, and it favors smaller regions. For example, Denver's 25% TUC rating is about six times greater than New York's. Can Denver residents access six times as many services and jobs, and can businesses attract six times as many customers and employees, as in New York? Certainly not. Denver's higher rating reflects its smaller area and faster traffic, ignoring New York's better non-auto travel options and proximity to services and jobs.

Figure 14 **Large Region Total Urban Coverage (TUC), Range and Area**

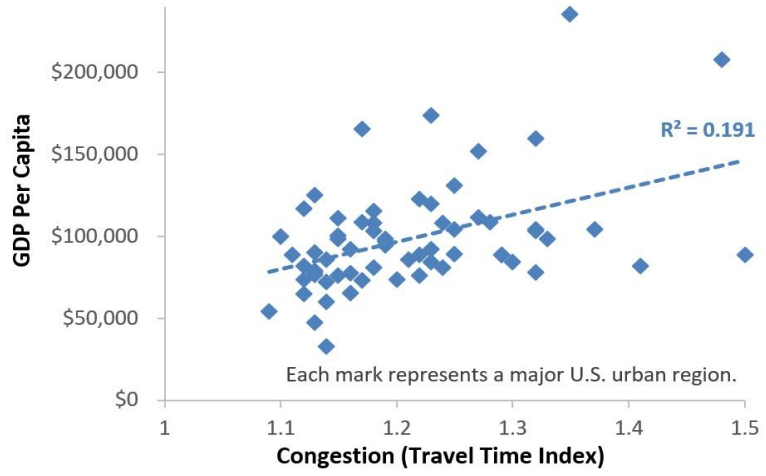
Rank	Urban Area	TUC_O	Range (Miles)	Area ($Miles^2$)
1	Denver-Aurora CO	25.3%	4.1	656
2	San Diego CA	17.9%	4.2	689
3	Phoenix-Mesa AZ	16.5%	4.4	1,114
4	San Francisco-Oakland CA	16.2%	3.7	526
5	Minneapolis-St. Paul MN-WI	13.0%	4.5	1,082
6	Detroit MI	12.8%	4.7	1,318
7	Miami FL	12.2%	3.9	1,332
8	Tampa-St. Petersburg FL	11.3%	3.9	1,049
9	Los Angeles-Long Beach-Anaheim CA	11.1%	3.9	1,655
10	Dallas-Fort Worth-Arlington TX	11.0%	4.4	1,772
11	Houston TX	10.7%	4.2	1,778
12	Seattle WA	9.1%	4.1	1,041
13	Washington DC-VA-MD	8.8%	4.0	1,321
14	Chicago IL-IN	5.9%	4.0	2,377
15	Philadelphia PA-NJ-DE-MD	5.6%	3.9	1,950
16	Boston MA-NH-RI	5.1%	4.0	1,728
17	Atlanta GA	4.2%	4.3	2,592
18	New York-Newark NY-NJ-CT	3.8%	3.9	3,460

The TUC only measures the portion of a region that motorists can reach in 30 minutes. It rates smaller, auto-dependent regions like Denver, San Diego and Phoenix much better than large multimodal regions like New York, Atlanta and Boston, the opposite of true accessibility indicators. This provides no useful guidance for improving accessibility to services and jobs.

How does congestion affect economic goals?

Congestion cost studies claim that traffic congestion is a major constraint on economic activity and roadway expansions increase productivity. For example, the GTS states that "the negative externality of traffic congestion has a negative impact to the economy" and the UMR claims that reducing congestion increases productivity, but contrary to such claims, economic productivity tends to *increase* with congestion intensity as illustrated below.

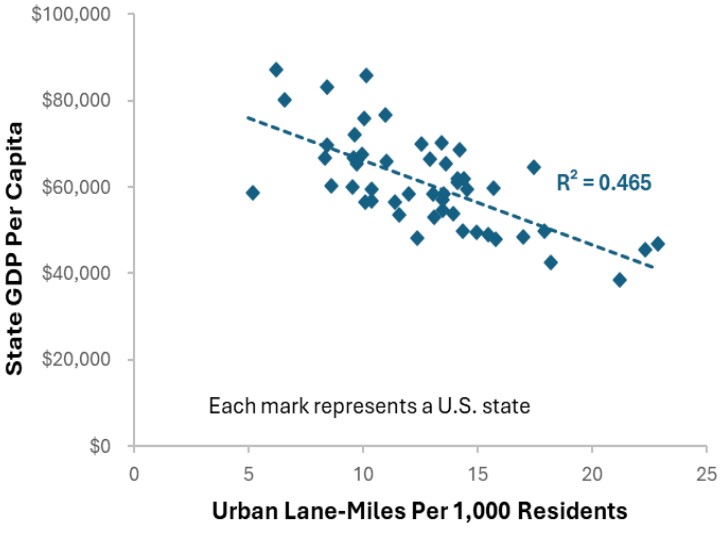
Figure 15 **Economic Productivity Versus Congestion Intensity**



Productivity tends to increase with urban traffic congestion. This contradicts common assumptions that congestion constrains economic activity and that faster vehicle traffic increases productivity. More compact development and multimodal planning tend to increase prosperity more than faster driving.

Similarly, economic productivity tends to increase with development density and non-auto travel, and declines with per capita vehicle-miles and roadway supply as illustrated below. This indicates that automobile traffic speeds are a relatively minor factor in overall accessibility: residents can access more jobs and services, and businesses can attract more customers and employees, in compact, multimodal cities than in automobile-dependent sprawl.

Figure 16 **Economic Productivity Versus Urban Roadway Supply**



Contrary to highway industry claims, urban roadway expansions do not increase economic productivity.

How should cities solve traffic congestion?

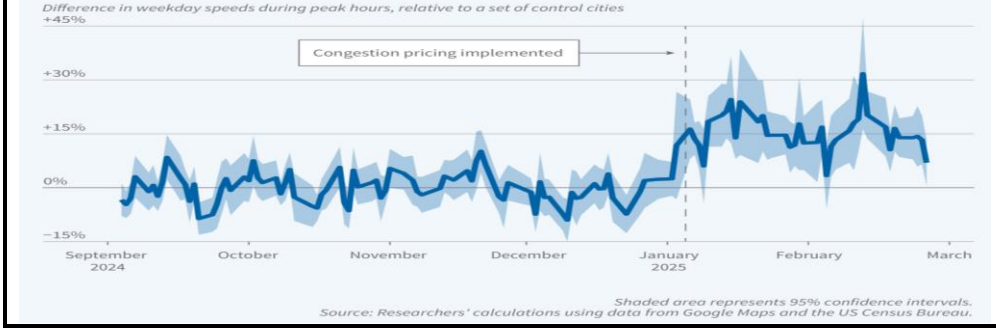
The UMR links to the *How to Fix Congestion* website that identifies 98 potential congestion reduction strategies. Many of these expand roadways, which they claim reduces delay and increases safety, ignoring induced vehicle travel impacts and the increased crash injury risks resulting from faster traffic. These effects tend to reduce long-term benefits.

A basic economic principle is that markets are most efficient and fair if the prices users pay for goods reflect their marginal costs, or as commonly described, consumers should "get what they pay for and pay for what they get." Applying this principle to transportation prevents governments from spending more to expand roads than the user benefits they provide, avoids forcing non-users to subsidize roads they do not demand, and allows higher value trips to outbid lower value trips for scarce road space. Roadway expansions that cannot be financed by user fees are economically inefficient: their costs exceed their benefits. This creates a paradox; motorists want bigger roads provided somebody else bears the costs, but if asked to pay directly with user fees, demand disappears. Just as most motorists choose affordable vehicles rather than sportscars, most motorists want affordable rather than speed-maximizing roadways.

Governments currently spend about $1,000 per vehicle-year on roadways, about half funded by user fees (special fuel taxes and tolls) and half by general taxes. Expanding highways enough to significantly reduce congestion using would require approximately doubling spending to $2,000 per vehicle-year if funded by general taxes. Less funding is required if road expansions are financed with increased fuel taxes since higher fuel priced reduce vehicle traffic. Fuel taxes currently average about 50¢ per gallon and total about $500 per vehicle-year; to generate enough additional revenue to significantly expand urban highways would require doubling or tripling fuel tax rates, increasing fuel prices about 50% which should reduce driving and congestion about 15%, assuming a -0.3 long-term fuel price elasticity.

Much larger congestion reductions and economic savings are possible if transportation improvements are financed by efficient tolls that increase with congestion, particularly if implemented with improvements to space-efficient modes. For example, since New York City imposed tolls in lower Manhattan traffic volumes declined 10-20%, city center traffic speeds increased 11% (figure below), crash casualties declined 15%, pollution and noise complaints are lower, freight delivery costs declined $1.3 billion and local business activity increased.

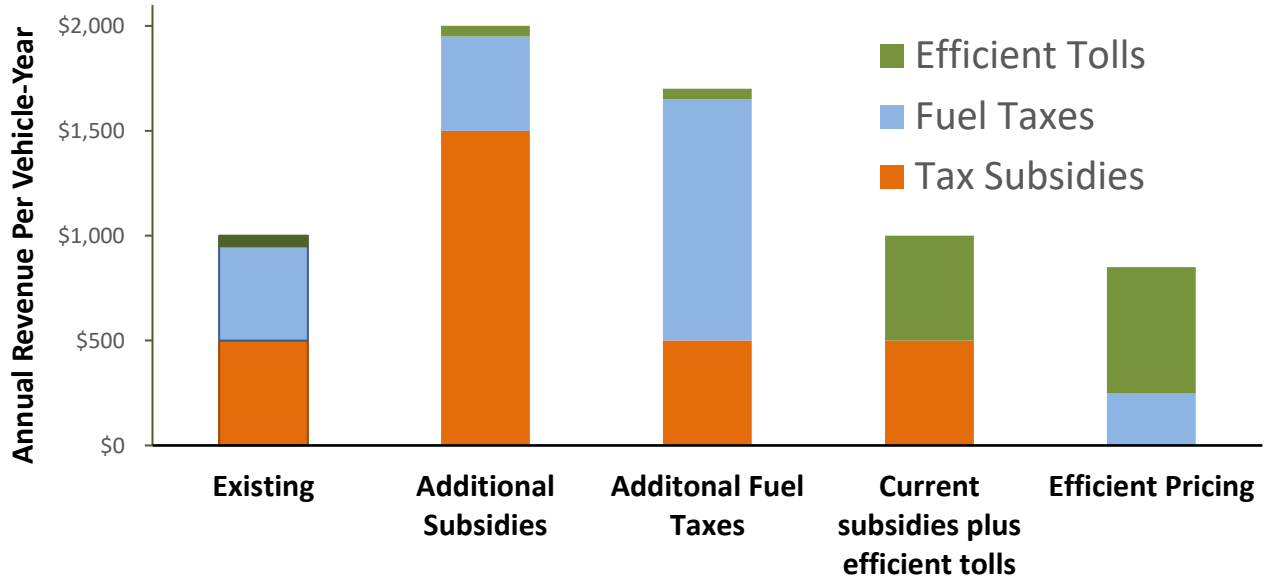
Figure 17 **NYC Congestion Pricing Impacts on Business District Traffic Speeds**



Tolls increased New York City traffic speeds more than 15%.

The graph below compares the total revenue required to significantly reduce congestion using various funding sources. General taxes, or fixed vehicle fees such as an additional sales taxes or annual registration fees, have the highest funding requirements because they provide no incentive to reduce driving. Fuel tax increases reduce traffic and revenue needs about 15%. Road tolls added to existing road funding could significantly reduce congestion without increasing total funding, and if all roadway costs were funded by user fees (fuel taxes and efficient tolls), both congestion and total revenue needs could be reduced.

Figure 18 **Funding Required to Reduce Congestion by Revenue Source**



Current roadway spending averages about $1,000 per vehicle-year, half from user fees (fuel taxes and road tolls) and half subsidized by general taxes. To expand roadways enough to significantly reduce congestion with general taxes or fixed vehicle fees would require doubling current spending and tripling current subsidies. Fuel tax funding would reduce traffic and revenue needs about 15%. If funded by current subsidies plus efficient tolls, congestion could be reduced with current spending levels. If completely funded by efficient tolls, congestion could be reduced with less total spending.

Road tolls improve efficiency in another way; they allow higher value trips to outbid lower value trips on congested roads. For example, with efficient tolls a typical commuter would usually choose to save money by using non-auto modes or free but congested lanes, but once or twice a week would happily pay a $5 toll to use an uncongested lane for an urgent trip. Similarly, a bus or freight truck would happily pay a $20 toll to use an uncongested lane that provides large time and vehicle expenses.

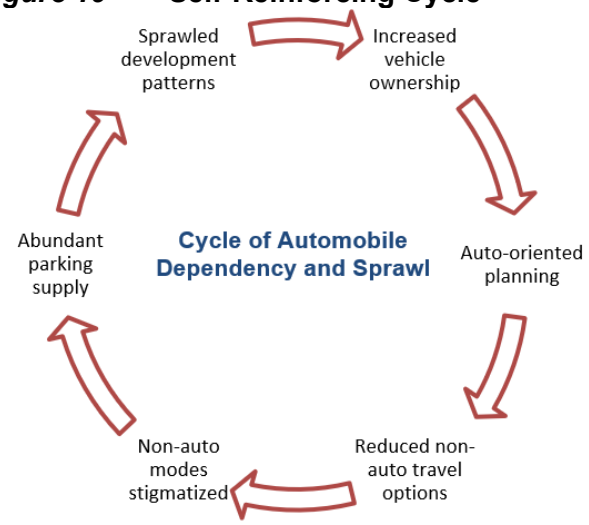
An illustrative example

Imagine that your five-mile commute takes ten minutes during off-peak periods and 15 minutes during peaks. Standard congestion costing methods would give this trip a high 1.5 Travel Time Index and an $8 daily cost (5 minutes delay per commute, twice a day, at $24 per hour), totaling about $1,800 annually. Standard costing methods assume that you would consider these delays a major problem, and would willingly pay tolls up to $2 per trip or $900 additional annual fuel taxes if they could fund roadway expansions that halve your commute delays from 5 to 2.5 minutes per trip. Few commuters are likely to agree with these assumptions; a 15-minute commute is considered ideal, providing a separation between home and work, and given a choice most travellers choose to save money rather than modest amounts of time.

Image that you also parent a teenager who must travel to a school located at the edge of town that is difficult to reach by walking and bicycling, forcing you to make two daily 10-minute detours. Most youths prefer walking and bicycling to school, at least sometimes, and many communities have targets to encourage active travel, and these chauffeuring burdens increase drivers' travel time, fuel and emission costs than five minutes of congestion delay, but conventional transportation planning does not usually quantify and monetize these impacts. As a result, conventional planning can justify highway expansions to reduce congestion but does not value sidewalk, bikeway and public transit improvements that reduce chauffeuring burdens.

Why was your children's school located at the urban fringe rather than in the center of the neighborhoods where it is easier to access by active modes. Probably because school planning guidelines favor locations along arterials where they are easy to reach by automobile, with large parcels to provide adequate parking. Traffic impact analysis would indicate that expanding central neighborhood schools would increase local congestion, measured as declining LOS, but urban-fringe development would not. In this way, overestimates of congestion costs and roadway expansion benefits favors roadway expansions over other transportation system improvements, and sprawl over compact infill, as illustrated to the right.

Figure 19 **Self-Reinforcing Cycle**



Overvaluing congestion costs and roadway expansion benefits contributes to the self-reinforcing cycle of automobile-dependency and

Congestion cost analysis often reflects elite bias, the tendency of decision-makers (elected officials, practitioners and influential citizens) to be busy, middle-income drivers who are personally familiar with congestion frustrations and less familiar with other accessibility constraints. Although only a minority of total travellers face significant congestion costs, most decision-makers probably do. More comprehensive congestion cost analysis can better reflect all travel demands, including the needs of non-drivers.

Key insights

1. Urban traffic congestion maintains equilibrium. Congestion increases until it discourages some potential trips. This point of equilibrium depends on the quality of alternatives and incentives.
2. Many studies exaggerate congestion costs. Commonly cited studies use baseline speeds that exceed what is legal, safe and efficient, and overvaluing travel time. There is no evidence that most motorists would willingly pay the amounts these studies estimate to reduce congestion.
3. These studies do not reflect academic standards. They fail to explain their methods and input data, and their results cannot be replicated.
4. Most reported congestion delay increases result from faster off-peak travel speeds rather than slower peak-period speeds. There is little credible evidence that congestion is getting worse overall or that roadway expansions reduce congestion over the long run.
5. Roadway expansions are costly and inefficient. Expanding urban roads typically costs more than most motorists would willingly pay to reduce delay, and by inducing more vehicle travel increases indirect and external costs. Few urban highway expansions could be fully funded with user fees, indicating that they are not cost-effective; their costs exceed their benefits.
6. How roadways are funded affects cost efficiency. Road expansions financed with general taxes gives motorists no incentive to reduce peak-period trips, and unfair because it forces non-drivers to subsidize urban-peak drivers. Fuel taxes are better, and efficient tolls are the best way to reduce congestion and fund transportation.

What should planners do?

Traffic congestion is wasteful and frustrating, but just one of many transportation costs, and not the largest. Current congestion costing methods are misguided. As Professor David Levinson *explains*, "Instead of measuring and monetising the fairy dust of `travel time savings', a transport facility should be assessed on how much access it produces per unit of investment."

Traffic congestion is just one of many factors that affect overall accessibility and generally not the most important; financial costs, travel distance and lack of non-auto modes often constrain people's ability to reach services and activities. Although motorists often complain about congestion, when given a choice most prefer to save money rather than time. Most studies evaluated in this report exaggerate costs. This is harmful: it leads to overinvesting in roadway expansions and underinvesting in other transportation improvements.

It is irrational to calculate congestion costs based on freeflow speeds that exceed what is legal, safe and efficient. More accurate congestion cost analysis helps guide planning decisions to reflect what travellers actually want, considering trade-offs between traffic speeds and other goals such as affordability, cost efficiency and safety. Comprehensive congestion evaluations should use traffic or efficiency optimizing baseline speeds rather than freeflow, realistic values of travel time that reflect motorists' willingness to pay for faster travel, account for induced traffic effects, and account for co-benefits provided by congestion reduction strategies that improve travel options, encourage efficient mobility and create more compact communities.

Smart solutions exist. Improving space-efficient modes, TDM incentives that discourage urban-peak vehicle travel, and more compact, multimodal development can reduce congestion delays and other transportation problems in ways that are cost-effective, efficient and equitable.

For More Information

Paulo Anciaes, Yan Cheng and Stephen John Watkins (2025), "Policy Measures to Reduce Road Congestion: What Worked?," *Journal of Transport & Health*, Vo. 41.

ATRI (2024), *Cost of Congestion to the Trucking Industry*, American Transportation Research Institute.

Anupriya, Prateek Bansal and Daniel J. Graham (2023), "Congestion in Cities: Can Road Capacity Expansions Provide a Solution?," *Transportation Research Part A*, Vo. 174.

James Brasuell (2022), *Planning for Congestion Relief*, Planetizen.

Eric Dumbaugh (2012), *Rethinking the Economics of Traffic Congestion*, Atlantic Cities.

FHWA (various years), *Urban Congestion Trends*, US Federal Highway Administration.

Jinwon Kim (2022), "Does Roadwork Improve Road Speed?," *Regional Science and Urban Economics*.

Jonathan Levine, et al. (2012), "Does Accessibility Require Density or Speed?" *Journal of the American Planning Association*, Vo. 78, No. 2, pp. 157-172.

Todd Litman (2025), *Smart Congestion Relief*, Victoria Transport Policy Institute.

Todd Litman (2026), *Congestion Costing Critique: Critical Evaluation of the "Urban Mobility Report"*, Victoria Transport Policy Institute.

David Metz (2021), "Economic Benefits of Road Widening: Discrepancy Between Outturn and Forecast," *Transportation Research Part A*, Vo. 147, pp. 312-319.

Adam Millard-Ball and Michael Rosen (2025), *Road Capacity as a Fundamental Determinant of Vehicle Travel*, UC Institute of Transportation Studies (doi.org/10.7922/G2Q52N05).

Allison Parshall (2025), "Widening Highways Doesn't Fix Traffic. Here's What Can," *Scientific American*.

Bruce Schaller (2019), What Urban Sprawl Is Really Doing to Your Commute, City Lab.

Matthias Sweet (2013), "Traffic Congestion's Economic Impacts," *Urban Studies*, Vo. 50/15.

ATRI (2024), *Cost of Congestion to the Trucking Industry*, American Transportation Research Institute.

Ian Wallis and David Lupton (2013), *Costs Of Congestion Reappraised*, New Zealand Transport Agency.

www.vtpi.org/arcc.pdf