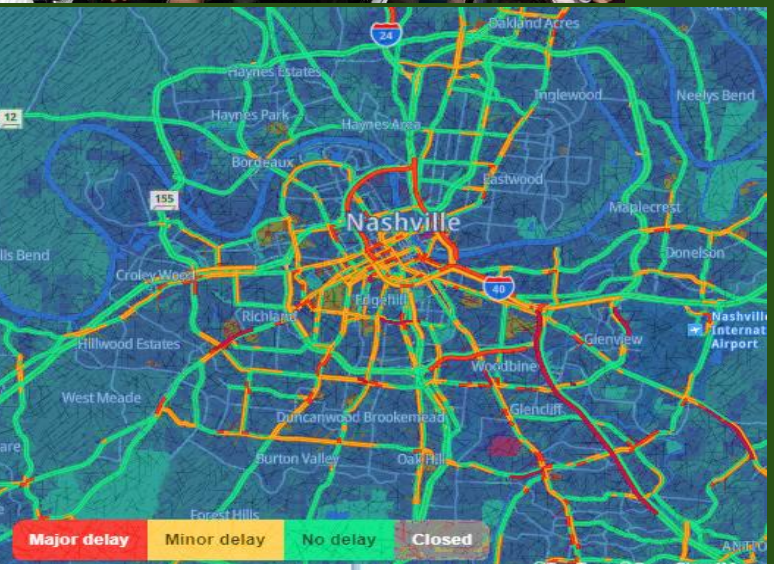

Congestion Costing Research Slideshow

New Insights and Better Solutions

Todd Litman

Victoria Transport Policy Institute

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1 June 2026

Congestion Costing Research

Traffic congestion is frustrating and wasteful, but misguided solutions are even worse.

This research program identifies best practices for evaluating congestion impacts, examines the practices used in congestion costing studies such as the *Urban Mobility Report*, the *Global Traffic Scorecard* and the *TomTom Traffic Index*, and provides guidance for identifying optimal solutions.

This slideshow summarizes:

- *Congestion Costing Best Practices*
- *Smart Congestion Relief*
- *Congestion Costing Critique*.


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Smart Congestion Relief

Comprehensive Evaluation of Traffic Congestion Costs and Congestion Reduction Strategies

25 May 2026

Todd Litman
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Abstract

This report investigates the best ways to evaluate the efficien congestion reduction strategies. It identifies best evaluation pr of congestion reduction strategies, compares conventional an optimal solutions. It finds that conventional analysis exaggera roadway expansion benefits, and undervalues multimodal pla management (TDM) and Smart Growth solutions. These biase to overinvest in automobile infrastructure and underinvest in s programs compared with what is most efficient, fair and respo practices assume the goal is to maximize traffic speeds; best transportation efficiency for all travellers. The old paradigm as *imposed on* motorists due to inadequate road capacity, implyi road space; a new paradigm recognizes that congestion is als *other road users* due to the greater space they require compa justifies more multimodal planning and efficient road pricing. T than previous studies. It is a companion to *Congestion Costin Congestion Costing Critique* reports.

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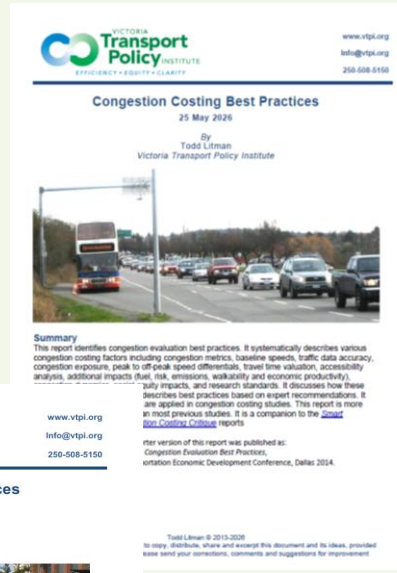
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Congestion Costing Best Practices

25 May 2026

By
Todd Litman
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Summary

This report identifies congestion evaluation best practices. It systematically describes various congestion costing factors including congestion metrics, baseline speeds, traffic data accuracy, congestion exposure, peak to off-peak speed differentials, travel time valuation, accessibility analysis, additional impacts (fuel, risk, emissions, walkability and economic productivity), puity impacts, and research standards. It discusses how these describes best practices based on expert recommendations. It are applied in congestion costing studies. This report is more n most previous studies. It is a companion to the *Smart tion Costing Critique* reports

rter version of this report was published as:
Congestion Evaluation Best Practices,
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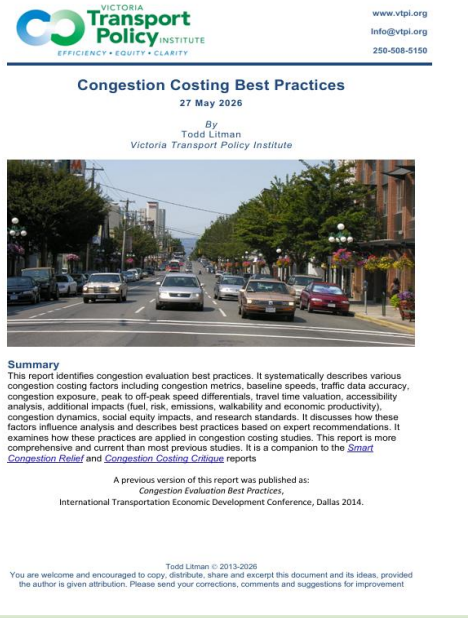
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Congestion Costing Best Practices

27 May 2026

By
Todd Litman
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Summary

This report identifies congestion evaluation best practices. It systematically describes various congestion costing factors including congestion metrics, baseline speeds, traffic data accuracy, congestion exposure, peak to off-peak speed differentials, travel time valuation, accessibility analysis, additional impacts (fuel, risk, emissions, walkability and economic productivity), congestion dynamics, social equity impacts, and research standards. It discusses how these factors influence analysis and describes best practices based on expert recommendations. It examines how these practices are applied in congestion costing studies. This report is more comprehensive and current than most previous studies. It is a companion to the *Smart Congestion Relief* and *Congestion Costing Critique* reports

A previous version of this report was published as:
Congestion Evaluation Best Practices,
International Transportation Economic Development Conference, Dallas 2014.

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Evaluation Best Practices

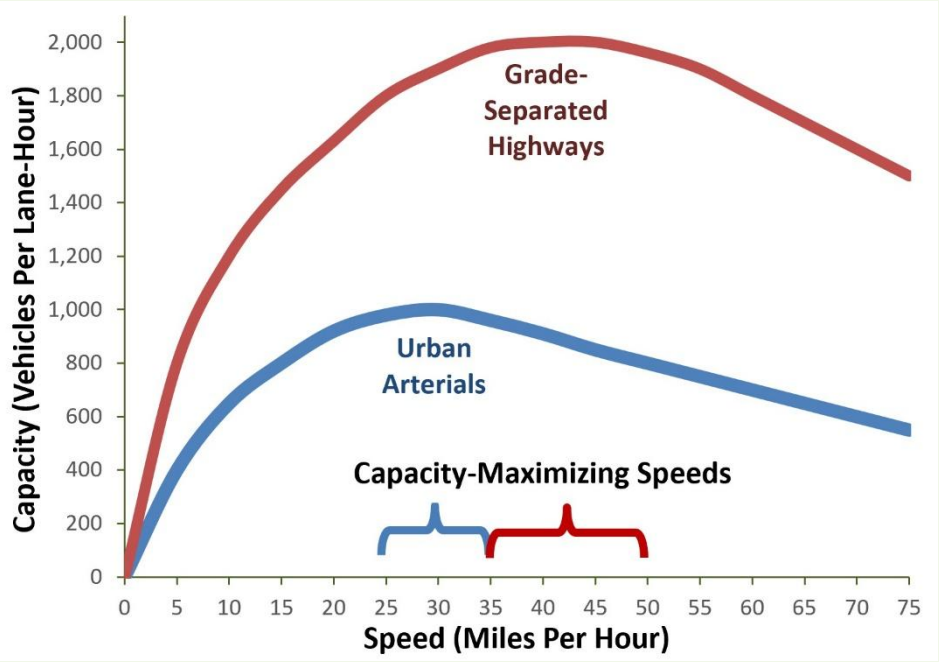
Costing Factor	Recommended Best Practices
Congestion metrics – how congestion is measured.	For planning, pricing and equity analysis, measure internal and external impacts on all modes based on deadweight losses.
Baseline speeds – Traffic speeds considered optimal	Use economically optimal baseline speeds that maximize efficiency and reflect users' willingness to pay for faster travel.
Traffic data accuracy – how sampled speed data are applied to total vehicle travel.	Recognize traffic app data biases. Adjust data to accurately reflect congestion delays experienced by average motorists.
Congestion exposure – the amount of travel that experiences congestion.	Use realistic estimates of congested vehicle travel. Measure congestion costs per capita or commuter, not per motorist or auto commuter.
Peak to off-peak speed trends – how speed differentials are calculated and interpreted.	Recognize that faster off-peak traffic increases estimated congestion delay hours.
Travel time valuation – monetary costs assigned to delay.	Use realistic values of time that reflect travellers' willingness-to-pay, such as 30-50% of average wages, unless other values are justified.
Additional impacts – impacts on fuel, risk, emissions, walkability and productivity.	Use best current models to analyze impacts of changes in speed, delay and vehicle travel. Strive for optimal speeds, mode shares and prices.
Congestion dynamics – the tendency of congestion to affect traffic and travel.	Recognize that congestion can be self-limiting, the quality of alternatives affects equilibrium levels, and effects of induced vehicle travel.
Equity analysis – the distribution of impacts and whether that is considered fair.	Determine how costs and benefits affect different groups, particularly people with disabilities, low incomes or other special needs.
Research standards – whether results are credible, understandable and replicable.	Maintain professional standards including transparent methods and data to allow replication, comprehensive references, plus peer review.

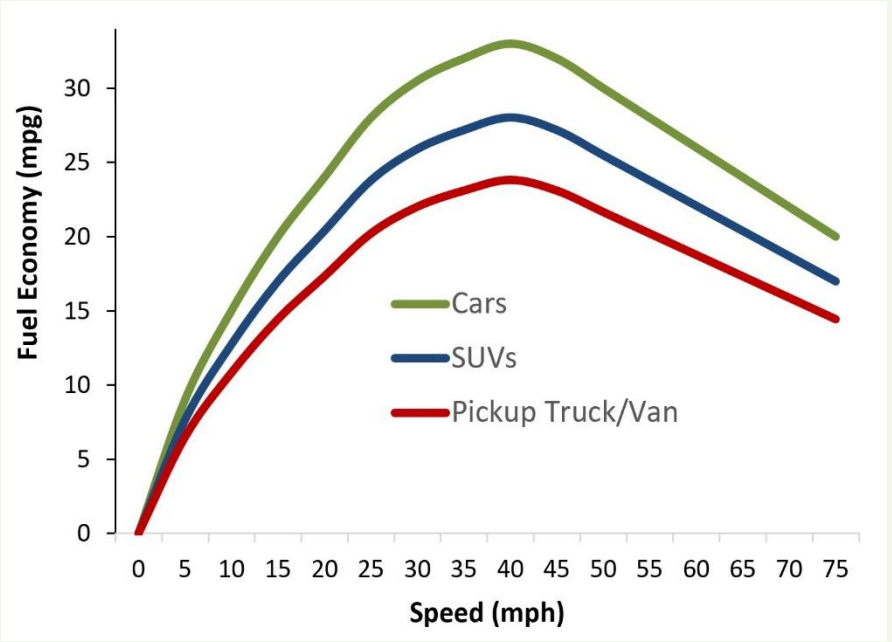
Common Analysis Distortions

The old paradigm considers congestion a cost imposed on motorists due to inadequate road capacity; this implies that motorists deserve more road capacity. However, congestion is also a cost that motorists impose on other road users due to their large space requirements compared with other modes; this justifies more multimodal planning and efficient transport pricing for efficiency and fairness.

1. **Only reporting impacts on motorists.** This overlooks the most effective congestion reduction strategies – shifting travel to other modes – and is unfair to non-drivers.
2. **Use freeflow baseline speeds that exceed what is legal, efficient and safe.** A major portion of estimated congestion "costs" are traffic speed compliance; drivers slowing to efficient and safe speeds.
3. **Exaggerate the amount of driving in congestion.** Traffic apps oversample congestion and studies assume that *all* urban-peak driving experiences significant delays.
4. **Overvalue delay.** Most studies value time at 50% to 100% of wages, more than experts recommend and what motorists are usually willing to pay for small travel time savings.
5. **Exaggerate congestion growth.** Counts faster off-peak speeds as an increase in congestion costs.
6. **Ignores costs caused by higher traffic speeds and induced vehicle travel.** Roadway expansions often increase downstream congestion, fuel, crash and pollution damages.

Efficient Speeds



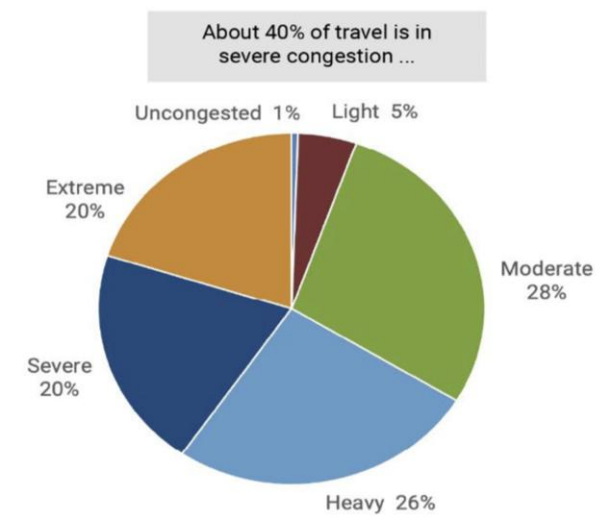


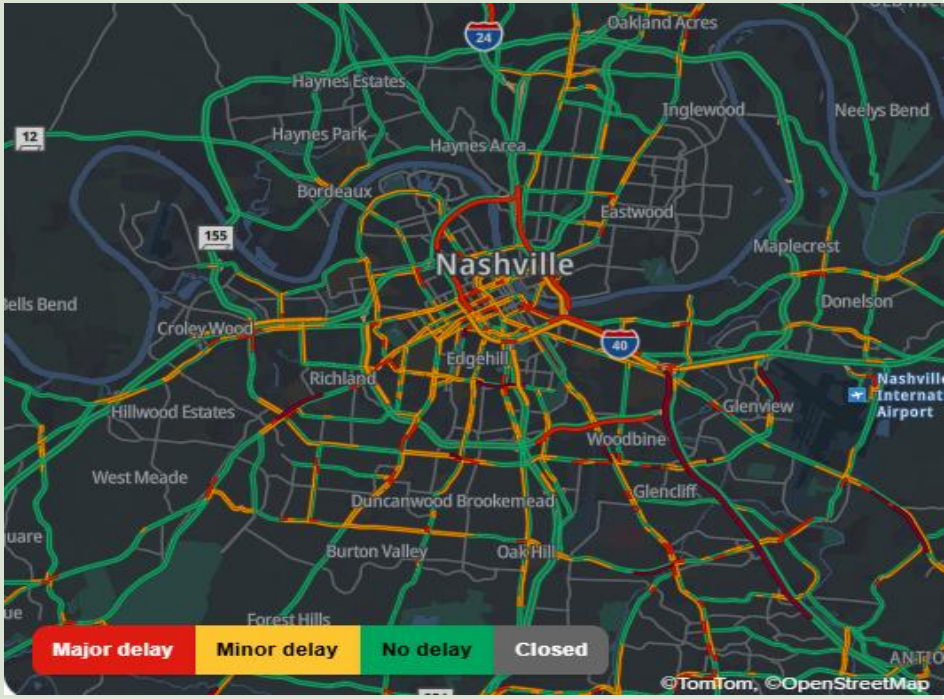
Since faster traffic requires more shy distance (separation) between vehicles, roadway capacity declines as speeds increase. Under optimal conditions traffic capacity and fuel economy typically peak at 25-35 mph (40-60 kph) on urban arterials and 35-50 mph (60-80 kph) on grade-separated highways.

Exaggerated Congestion Exposure

The *Urban Mobility Report* claims that 40% of urban peak travel occurs in severe or extreme congestion and only 1% is uncongested, but this reflects oversampling of delay by traffic apps such as INRIX and TomTom. Their results are inconsistent with other sources.

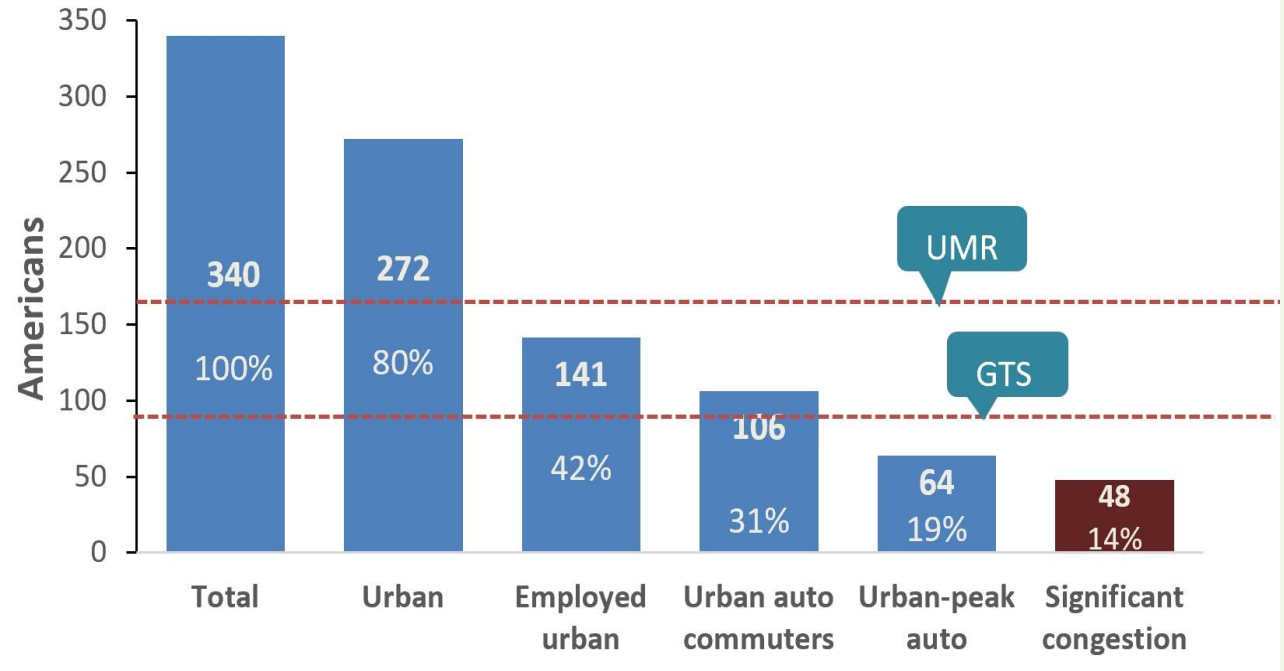
This traffic map of Nashville, a typical U.S. urban region shows that less than 5% of highways and less than 2% of total roadways experience major peak-period delays (marked red). Maps of other cities show similar results.





Congestion Exposure

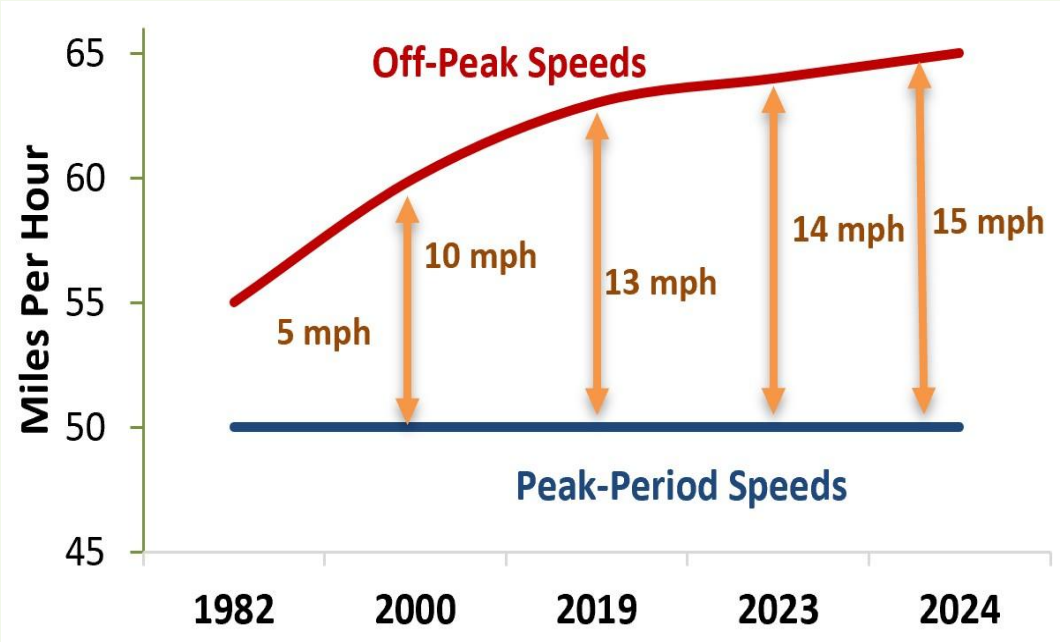
Most Americans infrequently experience severe congestion due to where, how or when they travel. Less than 15% have long urban-peak auto commutes. The *Urban Mobility Report* and *Global Traffic Scorecard* overestimate congestion exposure by assuming that all urban auto commuters experience significant delays, two or three times what this analysis indicates.



Peak Vs. Off-Peak Differentials

Congestion costing studies claim that congestion is increasing, but this is largely an artifact of their analysis methods: faster freeflow speeds increase speed differentials which they misinterpret as more congestion delay.

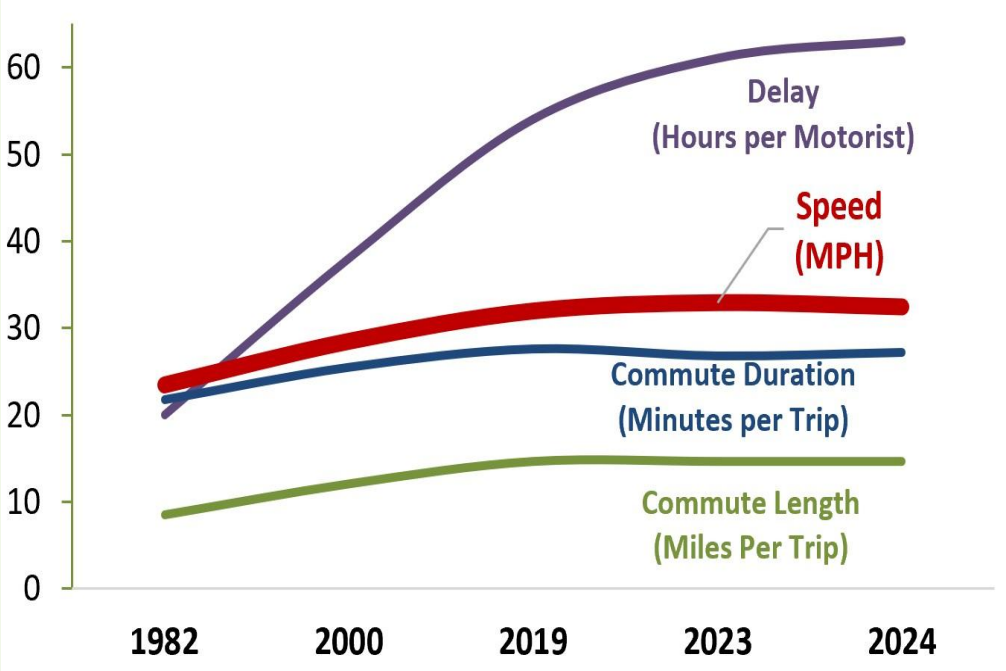
Between 1982 and 2024, higher speed limits (the 55 mph speed limit was rescinded in 1995, leading to higher limits on most highways), higher roadway design speeds, faster and more efficient vehicles, and less speed enforcement significantly increased freeflow speeds. In addition, many urban regions reduced legal speed limits. These increased speed differentials.



Commute Speed Trends

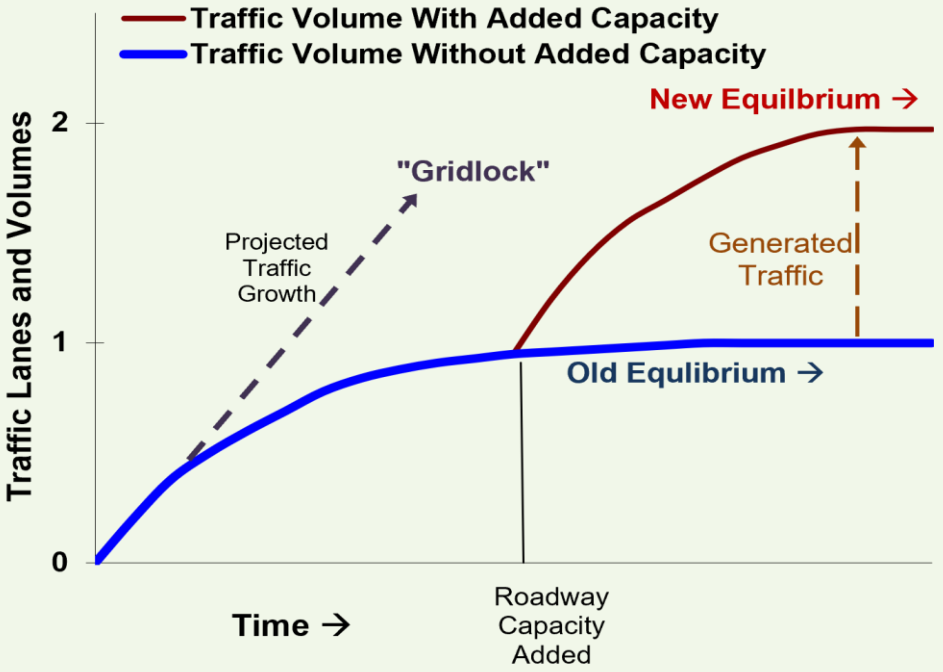
Congestion cost studies often claim that congestion problems are increasing, but this largely reflects faster off-peak traffic rather than more peak-period congestion delays. This is indicted by commute trip trends.

Between 1980 and 2024 average commute distances increased 38%, from 8.6 miles in 1980 to 14.7 miles in 2020, but commute duration only increased 25%, from 22 to 27 minutes per trip, resulting in a 38% average speed increase, from 24 to 32 mph.



A Better Understanding

- Our understanding of congestion is improving. Traffic was previously modelled as a fluid that flows through a road system, but we now recognize that it often behaves like a gas that fills available space and can be condensed with suitable incentives.
- Congestion tends to self-limit; it increases until delays prevent more peak-period vehicle trips.
- As a result, congestion seldom becomes as severe as predicted by extrapolating past trends, and urban highway expansions increase long run costs by increasing traffic speeds and inducing more vehicle travel, making them ineffective solutions.

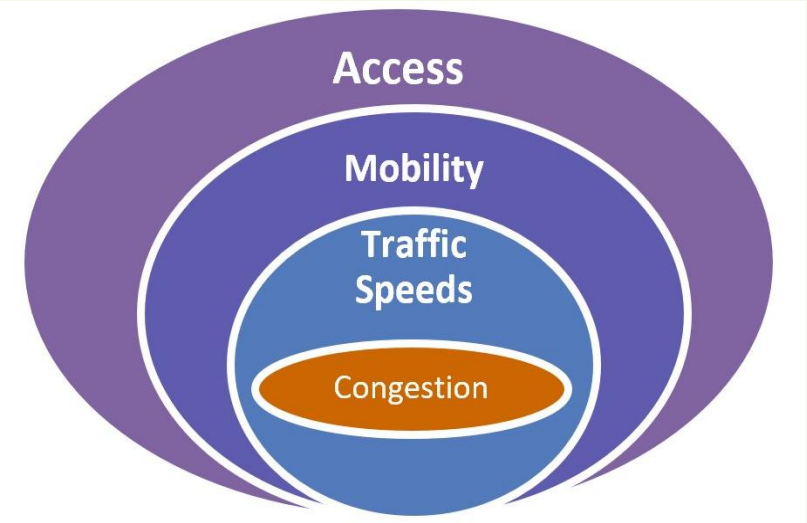


Traffic grows when roads are uncongested but this declines as congestion limits peak-period vehicle trips, creating a self-limiting equilibrium (indicated by the curve becoming horizontal). Extrapolating past trends without considering these effects exaggerates future congestion problems ("Gridlock"). If capacity increases, traffic grows until congestion returns, resulting in a new equilibrium with larger traffic volumes.

Accessibility

The goal of most travel is **access** to services and activities such as shops and jobs. Many factors affect urban accessibility including proximity (travel distances and therefore density and mix), transport network connectivity (connections between paths, roads, and other modes), and mobility (travel speed by various modes) and affordability.

Traffic congestion has relatively minor impacts on overall accessibility. Congestion reduction strategies can reduce overall accessibility by degrading non-auto travel or inducing more sprawl.

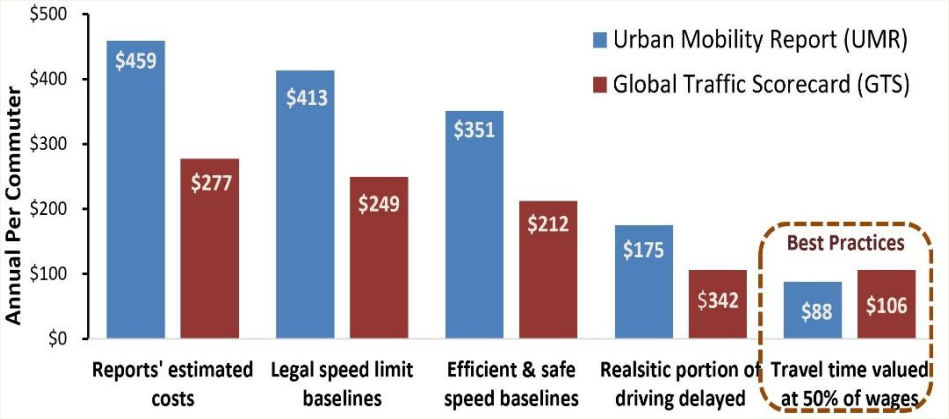


More Accurate Cost Estimates

- These graphs compare *Urban Mobility Report* and *Global Traffic Scorecard* cost estimates with results using best practices.
- Most congestion cost studies only report congestion costs per urban auto commuter, who represent about 31% of Americans. Measuring costs per motorist ignores the savings provided by non-auto travel and undervalues multimodal planning and TDM. Congestion costs measured per capita are much lower, particularly in compact, multimodal cities.
- This indicates that these studies overestimate congestion costs by an order of magnitude. This indicates that total commute and non-commute congestion costs calculated using best practices probably average $100 to $200 annually per capita.

Congestion Costs Per **Auto Commuter**

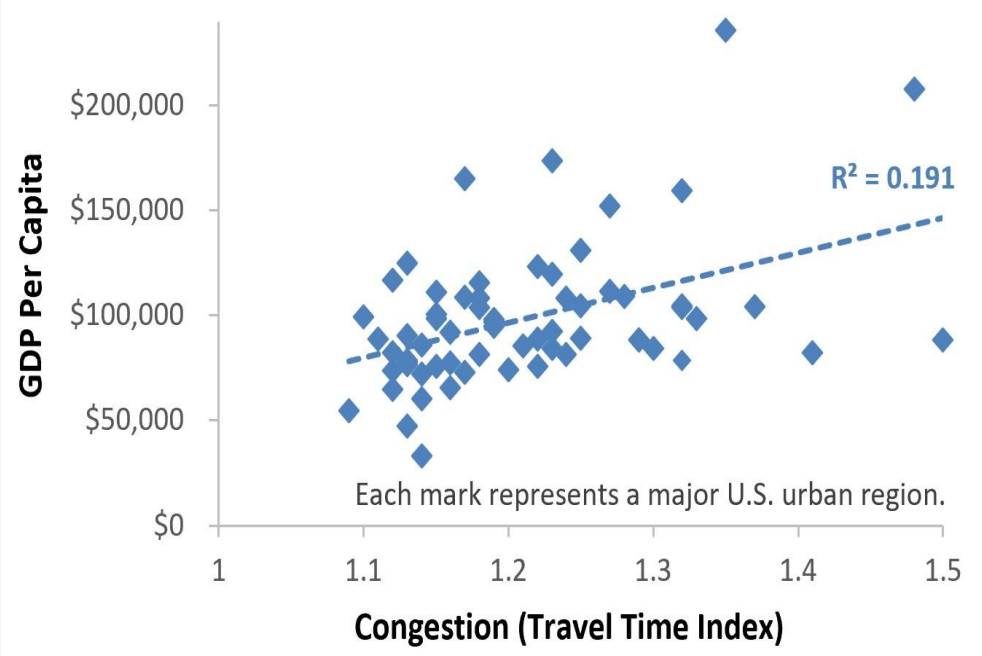
Congestion Costs Per **Commuter**



An Economic Trap

Congestion is an *economic trap* in which people compete in ways that are wasteful overall. An individual commuter can save time by driving instead of using space-efficient modes, but doing slows other travellers: an additional vehicle entering urban-peak traffic often imposes far more delay than it bears. Reducing congestion requires changing these incentives.

Strategic planning, efficient pricing and equity analysis require analysis of costs motorists impose, not just what they bear.

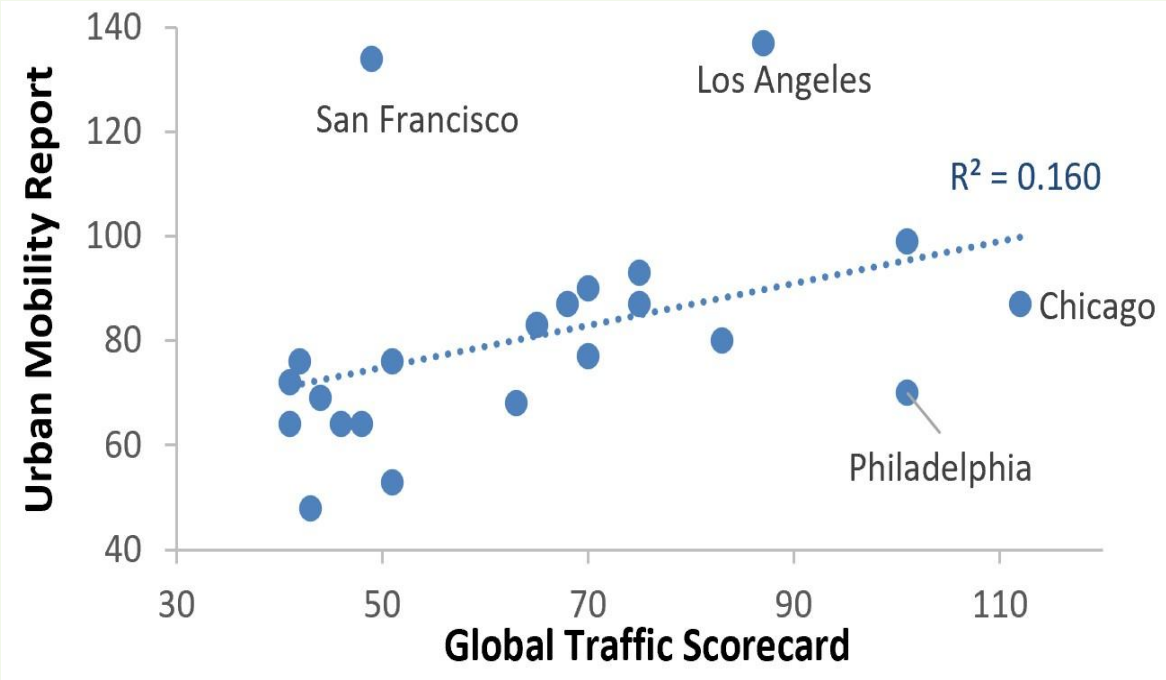


*Economic productivity tends to **increase** with urban traffic congestion. This contradicts claims that congestion is economically harmful and urban highway expansions are always beneficial. It suggests that other types of accessibility improvements, such as multimodal planning, TDM and compact development can do more to improve prosperity.*

Unreliable Analysis

Although the *Urban Mobility Report* and the *Global Traffic Scorecard* use the same methods and INRIX traffic 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.

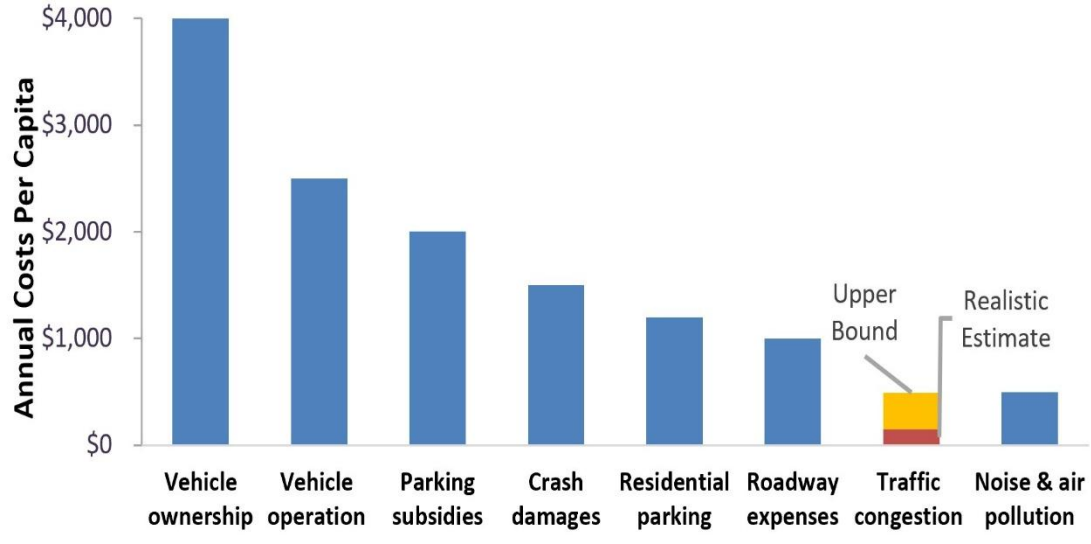
This suggests that their results are unreliable.



Costs Compared

Congestion cost estimates range from about $150 (realistic estimate) to $500 (upper bound estimate) annually per capita. Even the higher estimate is modest compared with other costs.

This indicates that a congestion reduction strategy is usually not cost effective if it significantly increases other costs, but is far more beneficial if it provides co-benefits. These harms are particularly large if urban roadway expansions degrade non-auto travel or induce more vehicle travel, increasing external costs. Accurate congestion costing helps evaluate these trade-offs.



Recommendations

- Evaluate transport system performance based on overall *accessibility* rather than *mobility* (traffic speeds). Recognize trade-offs between congestion reduction and other accessibility factors such as walkability, roadway connectivity and proximity (density).
- Although congestion intensity information is useful for making short-term decisions such as how to travel across a city, most strategic planning, pricing and equity analysis requires analysis of the delay costs travellers *impose* rather than just the costs they *bear*.
- Measure impacts on all travelers, not just to motorists, and all types of travel, not just commuting.
- Use efficiency-optimizing (typically LOS C) baseline speeds because this maximizes roadway capacity, fuel economy and safety, and reflects most travellers' willingness to pay for speed.
- Use travel time values that accurately reflect users' willingness-to-pay. This is typically 30-50% of average wages for personal travel, and wages and benefits for commercial travel. Recognize variations in travel time values and therefore the efficiency gains provided by favoring higher value over lower-value trips, such as congestion pricing.
- Use accurate models for evaluating fuel efficiency, emissions, safety and pedestrian delay impacts.
- Recognize that congestion tends to maintain self-limiting equilibrium: it increases to the point that delays limit further peak-period vehicle travel. As a result, traffic volumes and congestion costs seldom increase as much as predicted by extrapolating past trends, and roadway expansions tend to induce more driving.
- Account for induced vehicle travel impacts when evaluating roadway capacity expansions. These tend to reduce predicted congestion reduction benefits, provide user benefits, and increase external costs.
- Account for co-benefits when evaluating congestion reduction strategies. Improving travel information, multimodal planning, TDM incentives and Smart Growth policies tend to support multiple planning goals.
- Apply comprehensive evaluation of economic productivity, including impacts on consumer expenditures, non-drivers' employment access, and development patterns.
- Maintain research standards including transparency, replicability and detailed references. Identify potential sources of bias and apply sensitivity analysis to test alternative assumptions.

Quick, Cost Effective and Beneficial

Improve Space-Efficient Modes	TDM Incentives	Smart Growth Policies
• Complete sidewalk, crosswalk and bikeway networks. • Reduce urban traffic speeds. • Improve active mode access to transit. • Improve transit vehicle, stop and station comfort and amenities. • Increase transit service frequency. • Develop buslane and BRT networks. • Support bike- and carsharing.	• Expand when and where public parking is priced. • Encourage or require commute, school, special event and freight TDM programs. • Create transportation management associations in activity centers. • Improve non-auto travel information.	• Eliminate parking minimums. • Encourage or require parking cash out and unbundling. • Encourage or require developers to implement TDM policies. • Improve roadway connectivity and create walking and bike shortcuts. • Upzone to allow more infill in accessible, multimodal neighborhoods.

These congestion solutions can be implemented quickly, have low costs and many benefits.

What is Best? What is Fair?

What is Best?

Economic principles can help identify the best ways to reduce external costs such as congestion.

1. Improve user information so travellers can optimize their travel.
2. Apply peak-period road tolls that reduce traffic volumes to optimal levels.
3. Give space-efficient modes priority in traffic with bike, bus and HOV lanes.
4. Raise fuel taxes and efficiently price parking vehicle fees to reduce overall vehicle travel.
5. Subsidize and encourage space-efficient modes (walking, bicycling, transit and carsharing) to reduce urban vehicle ownership and use.
6. Expand urban highways with costs recovered tolls (this tests demand for additional road capacity).
7. Avoid expanding unpriced urban roads that induce more vehicle travel and traffic costs.

What is Fair?

Economic principles can help identify how to ensure that congestion solutions support equity goals.

1. Use comprehensive analysis that considers all impacts on all travellers, not just motorists.
2. Measure the congestion costs motorists impose, not just what they bear.
3. Ensure that non-drivers receive their fair share of public investments.
4. Favor modes used by disadvantaged groups including people with disabilities, low incomes and other special needs.
5. Apply universal design so transportation systems serve all types of travellers.
6. Favor affordable modes. Subsidize travel by lower-income people.
7. Mitigate external costs imposed by wider roads, higher traffic speeds and induced vehicle travel.

Conclusions

- Traffic congestion is a problem, but relatively modest compared with other factors that affect the time and money people spend travelling. Decision makers need comprehensive congestion impact analysis.
- Misguided congestion reduction strategies can be inefficient and unfair, increasing total costs and requiring large subsidies from non-drivers to the minority of people who regularly drive under urban-peak conditions.
- Current congestion costing studies tend to misrepresent travel demands. Some motorists would happily pay more to avoid congestion for some trips, but these are exceptions; motorists usually prefer to save money rather than small amounts of travel time.
- Overestimating congestion costs is harmful. Planning decisions involve trade-offs between mobility and other goals. Overvaluing congestion reduces the priority given to other accessibility strategies, such as multimodal planning and Smart Growth, and other community goals such as affordability, safety and mobility for non-drivers.
- This is new, important and unique research. It is time to scrutinize congestion costing methods to ensure that they accurately reflect what travellers want. Colleagues interested in collaborating on this should contact me at litman@vtpi.org.

“Generated Traffic: Implications for Transport Planning”

“Evaluating Accessibility for Transport Planning”

“Transportation Cost and Benefit Analysis”

“Congestion Costing Best Practices”

“The Future Isn’t What it Used to Be”

“Congestion Costing Critique”

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