

## Congestion Costing Critique

*Critical Evaluation of the “Urban Mobility Report”*  
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### Summary

The *Urban Mobility Report* (UMR) is a widely-cited study that estimates U.S. traffic congestion costs and recommends congestion reduction solutions. This report critically evaluates its methodologies. It identifies various problems with the UMR's analysis methods: it uses higher baseline speeds and travel time cost values than most experts recommend, exaggerates fuel savings and emission reductions, ignores generated traffic, and does not consider other planning goals. As a result it overestimates congestion costs, exaggerates roadway expansion benefits, and undervalues other congestion-reduction strategies. Much of its estimated congestion costs consist of speed compliance: traffic speeds declining to legal limits. As a result of these and other biases the UMR's congestion cost estimates represent upper-bound values, which are much higher than results from other studies that use more realistic assumptions. The UMR ignores basic research principles: it includes no current literature review, fails to fully explain assumptions and document sources, does not discuss possible biases, has no sensitivity analysis, and lacks independent peer review.



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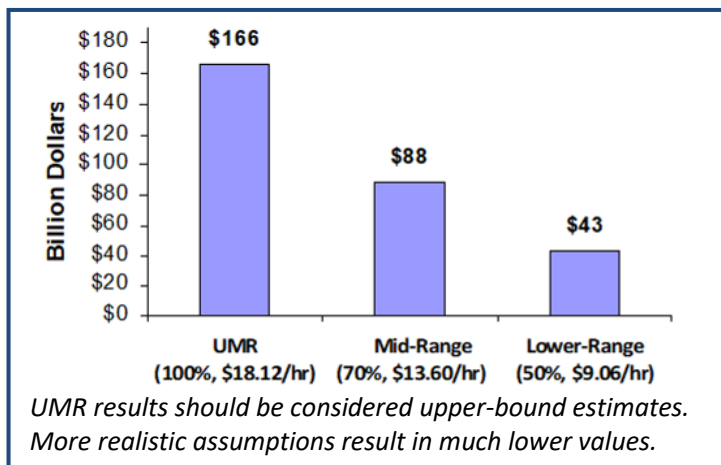
## Executive Summary

The Texas Transportation Institute’s *Urban Mobility Report* (UMR) is a widely cited source of congestion cost estimates and congestion reduction recommendations. However, it has several technical problems:

- It evaluates transportation system performance based on vehicle speeds rather than overall accessibility, and so ignores many factors that affect peoples’ access to services and activities.
- It ignores impacts on non-auto modes. Although it claims to measure *urban mobility*, it really only considers *automobile traffic congestion*, ignoring other travel modes and impacts.
- It uses higher baseline speeds and travel time cost values than experts recommend. Much of its estimated congestion costs consist of speed limit compliance (reducing speeds to legal limits).
- It exaggerates fuel savings and emission reductions.
- It ignores generated traffic impacts, including the increased crashes and pollution caused by roadway expansions.

As a result of these omissions and biases the UMR tends to overestimate congestion costs and roadway expansion benefits, and undervalues other congestion reduction strategies that provide other benefits, besides reducing congestion. Its methods and results are at odds with most other congestion cost studies. Its \$166 billion annual congestion cost estimate is about twice the \$87 billion estimated by INRIX, the organization that provides the UMR’s basic input data, and its claim that congestion problems are increasing are at odds with results from the FHWA’s *Urban Congestion Trends* report indicating that congestion problems have declined in most U.S. urban regions. Its cost estimates represent upper-bound values that are significantly higher than results using more realistic assumptions.

The UMR also ignores basic research principles. It contains no literature review, fails to clearly explain its assumptions or document sources, does not discuss potential biases, has no sensitivity analysis, and lacks independent peer review. The current edition provides less information about its methods than previous versions. It does not give readers the information they need to understand its results. For example, it fails to discuss how different indicators affect analysis result, for example, whether the analysis reflects congestion *intensity* (the amount that speeds decline during peak periods) or *costs* (annual hours of delay per traveller), and whether they are reported per *commuter* or per *motorist*.



These biases are significant because planning decisions often involve trade-offs between different goals and solutions. For example, road space can either be used for general traffic lanes or bus lanes, and money spent to expand roads is unavailable for other purposes. By exaggerating congestion costs relative to other impacts and ignoring generated traffic impacts, the UMR tends to overvalue urban roadway expansions and undervalue other congestion reduction strategies that provide more co-benefits. The UMR fails to explore these issues. More comprehensive and objective analysis is needed to identify truly optimal solutions.



## Introduction

Planners, decision-makers and the general public need comprehensive and objective information on congestion costs and the likely effects of potential solutions. The Texas Transportation Institute’s *Urban Mobility Report* (UMR) is a widely cited source of congestion cost estimates. Its conclusions and recommendations are used by media, professional organizations, and government agencies (ITE 2013; USDOT 2013). Most of its users probably assume that its results are accurate and objective.

Yet, the UMR’s analysis methods do not reflect current best practices, and it rejects research quality practices such as literature reviews, citing sources, explaining key assumptions, discussion of possible biases, sensitivity analysis, and independent peer review. Its biases tend to overestimate congestion costs compared with other impacts, exaggerate roadway expansion benefits, and undervalue other congestion reduction strategies. This can distort policy and planning decisions. Since planning decisions often involve trade-offs between different goals, these biases are likely to result in over investment in roadway expansions and underinvest in goals such as safety, affordability and equity. Few journalists, professionals or decision-makers who use UMR results seem aware of these biases.

Although the *Urban Mobility Report* claims to evaluate urban transportation performance, it only measures congestion delay; it ignores other factors affecting urban accessibility such as the quality of non-auto travel, transport network connectivity, proximity (and therefore development density and mix), and affordability. Unless it becomes comprehensive and multi-modal, the UMR should be renamed the *Urban Congestion Report*.

The UMR’s approach is a throwback to an earlier age. It reflects an outdated transport planning paradigm which assumed that “transportation” means automobile travel and “transportation problem” means traffic delay. A new planning paradigm is more comprehensive and multi-modal (Litman 2013). Most planning professionals and jurisdictions are shifting from purely automobile-oriented to more multi-modal and accessibility-based transport system performance evaluation.

**Table 1**      **UMR Analysis Scope**

Impacts Considered	Impacts Ignored
<ul style="list-style-type: none"><li>• Personal and commercial motor vehicle delay</li><li>• Increased fuel consumption</li></ul>	<ul style="list-style-type: none"><li>• Public transit delay and crowding</li><li>• Pedestrian and bicycle safety and delay</li><li>• Parking facility costs</li><li>• Traffic safety and public health</li><li>• Total energy consumption and pollution emissions</li><li>• Consumer savings and affordability</li><li>• Land use development goals (reduced impervious surface and more accessible communities)</li></ul>

*The Urban Mobility Report only considers two impacts (traffic delay and fuel consumption). It ignores other important factors. This tends to bias results to favor roadway expansions and undervalues congestion reduction strategies that help achieve other planning objectives such as safety, health and affordability.*

This report investigates these issues. It identifies congestion costing best practices, evaluates the UMR’s methods and assumptions, investigates its omissions and biases, and provides recommendations for improving its analysis. It includes a point-counter-point dialogue with the UMR’s lead author. This analysis should be of interest to transport planners, economists, decision makers, journalists, and the general public who want to better understand congestion problems and potential solutions.



## Congestion Evaluation Best Practices

*This section evaluates the UMR’s methods with best practices for evaluating traffic congestion. For more discussion see Grant-Muller and Laird (2007) and Litman (2019).*

### *From Mobility- to Accessibility-Based Planning*

Transportation planning is shifting from mobility-based to accessibility-based analysis (Herriges 2018; Litman 2013). Mobility-based analysis considers mobility (physical movement) an end in itself and so evaluates transport system performance using indicators of travel speed such as vehicle traffic speeds, roadway level-of-serve and the travel time index. Accessibility-based planning recognizes that the ultimate goal of most travel activity (excepting travel that has no destination, such as walking or biking for exercise, or aimless cruising in a car) is to access desired services and activities, and that many factors can affect accessibility including traffic speeds, the speed of other modes, transportation system connectivity (the ease of connecting between mode and transport networks density), geographic proximity (and therefore development density and mix), plus user information and affordability (Brookings Institution 2016).

The old paradigm tends to consider traffic congestion a major problem which often justifies roadway expansions. The new paradigm considers congestion one of several important transportation problems, which also include inadequate mobility options, unaffordability, excessive public infrastructure costs, inequity, excessive health and safety risks, and environmental damages. It therefore recognizes ways that roadway expansions can reduce other forms of accessibility. For example (Litman 2021):

- Resources devoted to highway expansions are unavailable for improving other modes such as walking, bicycling, ridesharing and public transit, and for transportation demand management (TDM) programs that encourage more efficient travel patterns (SSTI 2018).
- Wider roads and faster traffic increase delay and risk to walking and bicycling (called the *barrier effect*), which shifts some active travel to chauffeured car trips, imposing time costs on drivers.
- Hierarchical road networks (smaller streets that connect to larger arterials but not each other) and one-way streets reduce connectivity, which increases the distances between destinations.
- Urban highway expansions displace high-accessibility urban neighborhoods and encourage sprawled development, which increase travel distances and reduce non-auto access.

The UMR reflects the older paradigm; it evaluates transportation system performance based only on vehicle traffic speeds. From this perspective, improvements to non-auto modes, TDM incentives, and development policies that create more accessible communities are only valued to the degree that they reduce traffic delay. It ignores direct benefits to people who use non-auto modes, and community benefits from reduced traffic impacts.

Accessibility-based planning evaluates transportation system performance based on door-to-door travel times, and so recognizes various factors that affect accessibility, not just traffic speeds (Levinson and King 2020; Sundquist, McCahill and Brenneis 2021). Measured this way, there is often a negative relationship between the UMR’s travel time index and overall accessibility because that more intense congestion associated with compact development is more than offset by improved mobility options and shorter travel distances, while sprawled areas that have less traffic congestion tend to have longer travel distances (Ewing, Tian and Lyons 2017; Kuzmyak 2012; Levine, et al. 2012; Litman 2019).

### *Baseline Speeds*

A key congestion costing factor is the *baseline* (also called *threshold*) speed below which congestion delays are calculated. For example, if the baseline speed is 60 miles per hour (mph), and peak-period traffic speeds are 50 mph, the delay is 10 mph. Baseline speeds can be based on:

- Speed limits (maximum legal speeds on a road).
- Free-flow speeds (traffic speeds measured during uncongested conditions).
- Capacity-maximizing speeds (speeds that maximize vehicle traffic capacity on each road).
- Economic efficiency-optimizing (also called *consumer-surplus maximizing* or *deadweight loss minimizing*) speeds, which reflect users’ willingness-to-pay for faster travel.

Traffic engineers describe freeflow or speed limits as level-of-service (LOS) A, while capacity-maximizing and efficiency optimizing speeds are typically LOS C or D, as indicated in Table 1. As traffic speeds increase so does the space required between vehicles (*shy distance*) for a given level of driver effort and safety. For example, a highway lane can efficiently carry more than 1,500 vehicles per hour at 45-54 mph, about twice the 700 vehicles that can operate comfortably at more than 60+ mph. Urban arterial capacity tends to peak at 35-45 mph. Few motorists are willing to pay for sufficient capacity to maintain freeflow speeds under urban-peak conditions, so freeflow speeds are usually economically inefficient.

**Table 1**      **Typical Highway Level-Of-Service (LOS) Ratings** (Wikipedia 2012)

LOS	Description	Speed (mph)	Flow (veh./hour/lane)	Density (veh./mile)
A	Traffic flows at or above posted speed limit. Motorists have complete mobility between lanes.	Over 60	Under 700	Under 12
B	Slightly congested, with some reduced maneuverability.	57-60	700-1,100	12-20
C	Ability to pass or change lanes constrained. Roads are close to capacity. Target LOS for most urban highways.	55-57	1,100-1,550	20-30
D	Speeds somewhat reduced, vehicle maneuverability limited. Typical urban peak-period highway conditions.	45-54	1,550-1,850	30-42
E	Irregular flow, speeds vary and rarely reach the posted limit. Considered a system failure.	30-45	1,850-2,200	42-67
F	Flow is forced, with frequent drops in speed to nearly zero mph. Travel time is unpredictable.	Under 30	Unstable	67-Maximum

*This table summarizes roadway Level of Service (LOS) ratings, an indicator of congestion intensity.*

Most experts therefore recommend capacity-maximizing or efficiency-optimizing rather than freeflow baseline speeds (TC 2006; Wallis and Lupton 2013). One leading economist explains,

“The most widely quoted [congestion cost] studies may not be very useful for practical purposes, since they rely, essentially, on comparing the existing traffic conditions against a notional ‘base’ in which the traffic volumes are at the same high levels, but all vehicles are deemed to travel at completely congestion-free speeds. This situation could never exist in reality, nor (in my view) is it reasonable to encourage public opinion to imagine that this is an achievable aim of transport policy.” (Goodwin 2003)

Analysis using freeflow baseline speeds assumes that faster is always better, while analysis using capacity-maximizing or efficiency-optimizing baseline speeds recognizes that lower, optimal speeds often maximize consumer benefits and economic value (Wallis and Lupton 2013).

Most recent congestion cost studies use capacity-maximizing or economic efficiency baseline speeds. For example, the Australian Bureau of Transport and Regional Economics recommends calculating congestion costs based on motorists willingness-to-pay for faster travel (BTRE 2007, p. 10). Using this method they estimate that congestion costs in major Australian cities totaled \$5.6 billion in 2005, less than half the \$11.1 billion calculated using freeflow speeds. Similarly, Wallis and Lupton (2013) estimate that, using capacity optimizing speeds, 2006 Auckland, New Zealand congestion costs totaled \$250 million, a third of the \$1,250 million cost estimate using freeflow speeds. Transport Canada calculates congestion costs uses 50%, 60% and 70% of free-flow speeds (Table 2), which they consider a reasonable range of optimal urban-peak traffic speeds.

**Table 2**      **Total Costs of Congestion (TC 2006, Table 5)**

City	Relative To Freeflow Speeds		
	50%	60%	70%
Vancouver	\$403	\$517	\$629
Edmonton	\$49	\$62	\$74
Calgary	\$95	\$112	\$121
Winnipeg	\$48	\$77	\$104
Hamilton	\$6.6	\$11	\$17
Toronto	\$890	\$1,267	\$1,632
Ottawa-Gatineau	\$40	\$62	\$89
Montreal	\$702	\$854	\$987
Quebec City	\$38	\$52	\$68
<i>Totals</i>	<i>\$2,270</i>	<i>\$3,015</i>	<i>\$3,721</i>

*Transport Canada calculates congestion costs based on 50%, 60% and 70% of freeflow speeds, which they consider the economically optimal range of urban-peak traffic speeds.*

The UMR is an exception. It uses *measured freeflow speeds*, even though they often exceed legal speed limits ([www.speed-limits.com](http://www.speed-limits.com)). For example, in Los Angeles, California it used a 64.6 mph freeflow baseline speed on freeways that have 55 mph speed limits; in Miami, Florida it uses a 64.0 mph baseline speed on freeways that have 60 mph speed limits, and in Madison, Wisconsin it uses 62.3 mph baseline speeds on freeways with 55 mph speed limits and 40.6 mph baseline speeds on urban arterials that have 35 mph speed limits, as illustrated in Table 3. Freeflow speeds normally exceed speed limits since transportation agencies often set speed limits based on 85th percentile freeflow speeds. This suggests that between a quarter and a half of the UMR’s estimated congestion costs represent speed compliance.



**Table 3 UMR Peak Versus Freeflow Speed Table (TTI 2012, Appendix A)**

Exhibit A-8. 2011 Traffic Speed Data

Urban Area	Freeway		Arterial Streets		Urban Area	Freeway		Arterial Streets	
	Peak Speed	Freeflow Speed	Peak Speed	Freeflow Speed		Peak Speed	Freeflow Speed	Peak Speed	Freeflow Speed
Very Large Areas					Large Areas				
Atlanta GA	56.5	64.7	36.3	44.1	Minneapolis-St. Paul MN	54.3	63.8	39.6	43.1
Boston MA-NH-RI	54.2	63.4	29.5	36.0	Nashville-Davidson TN	57.2	64.1	34.2	41.9
Chicago IL-IN	53.0	63.1	34.3	40.2	New Orleans LA	54.9	63.2	39.6	43.7
Dallas-Fort Worth-Arlington TX	54.0	64.1	33.1	39.1	Orlando FL	58.8	64.3	34.9	42.8
Detroit MI	57.0	64.3	33.4	38.7	Pittsburgh PA	55.2	62.6	33.3	40.1
Houston TX	54.2	63.3	33.9	40.2	Portland OR-WA	49.2	60.3	31.1	36.5
Los Angeles-Long Beach-Santa Ana CA	48.6	64.6	37.4	43.7	Providence RI-MA	56.1	61.9	30.9	35.0
Miami FL	56.7	64.0	31.7	39.2	Raleigh-Durham NC	61.3	64.1	39.1	45.4
New York-Newark NY-NJ-CT	52.0	62.2	31.9	40.5	Riverside-San Bernardino CA	54.4	64.7	37.5	43.1
Philadelphia PA-NJ-DE-MD	55.5	63.6	31.8	39.2	Sacramento CA	55.2	64.7	37.4	43.5
Phoenix AZ	57.4	64.2	34.7	40.1	San Antonio TX	57.2	62.9	35.0	39.4
San Diego CA	56.8	64.5	37.6	43.7	Salt Lake UT	60.3	64.4	33.6	39.2
San Francisco-Oakland CA	54.0	64.1	37.8	44.0	San Jose CA	57.1	64.0	34.6	40.4
Seattle WA	51.2	62.4	30.4	35.2	San Juan PR	54.5	64.7	39.5	46.1
Washington DC-VA-MD	49.4	62.0	32.9	40.1	St. Louis MO-IL	44.4	56.0	29.8	34.9
					Tampa-St. Petersburg FL	59.1	64.2	37.2	44.2
					Virginia Beach VA	56.1	62.9	35.1	41.5
Large Areas									
Austin TX	52.9	62.6	36.2	42.9					
Baltimore MD	53.3	62.7	31.8	38.6					
Buffalo NY	55.2	62.0	33.4	38.6					
Charlotte NC-SC	58.0	62.9	34.0	41.4					
Cincinnati OH-KY-IN	56.3	63.7	32.5	38.2					
Cleveland OH	56.8	62.8	29.6	34.6					
Columbus OH	57.6	64.1	31.1	37.3					
Denver-Aurora CO	50.9	62.3	32.1	38.0					
Indianapolis IN	55.4	63.0	34.6	40.1					
Jacksonville FL	58.9	63.4	37.4	43.3					
Kansas City MO-KS	57.6	62.7	33.9	37.5					
Las Vegas NV	57.4	64.6	33.7	39.8					
Louisville KY-IN	57.0	63.7	34.0	39.9					
Memphis TN-MS-AR	56.9	64.0	36.1	42.5					
Milwaukee WI	55.6	62.5	35.7	39.3					

*The Urban Mobility Report freeflow traffic speeds often exceed legal speed limits. In many cases more than half of the estimated congestion “cost” consists simply of speed limit compliance. (The most recent UMR does not provide this information so it is not possible to peer review its analysis.)*

The UMR is also exceptional because it includes no discussion of these issues or sensitivity analysis showing how results would change with different baseline speeds. After the UMR was criticized for excessive baseline speeds in 2012, subsequent reports only provide results and conclusions with no opportunity for peer review. A major Transport Canada report, *The Cost of Urban Congestion in Canada*, specifically criticizes the UMR’s use of freeflow speeds, stating, “Some have expressed concern that the TTI method suggests that free-flow speed is the desired objective; meaning in turn that the appropriate infrastructure is needed to meet this objective. However, such levels of capacity are neither environmentally sustainable nor economically efficient.” (TC 2006, p. 7)

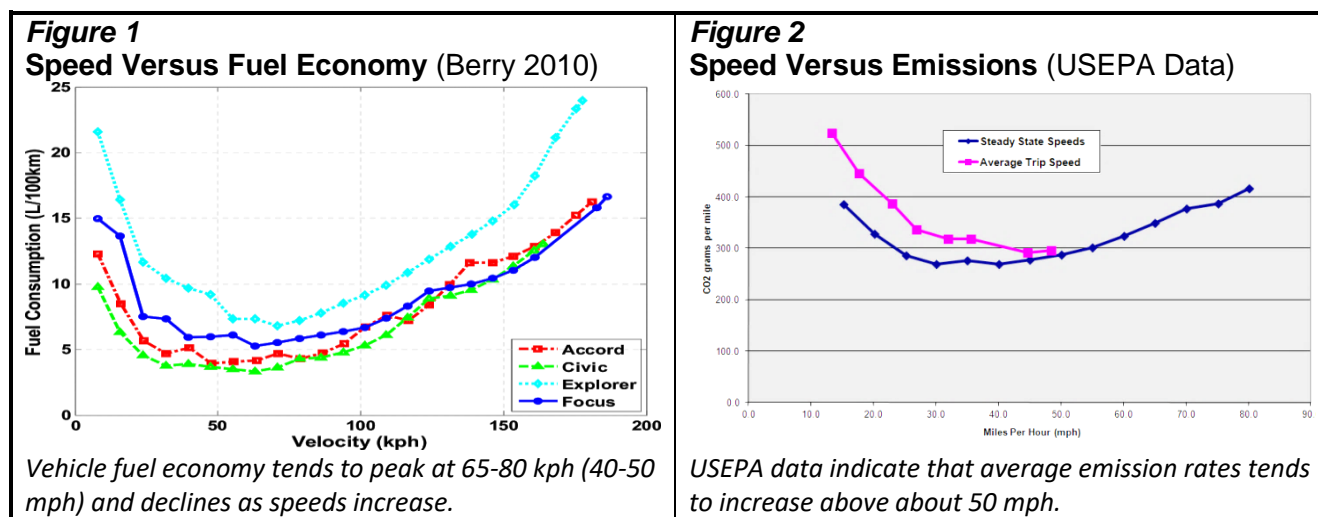
### Travel Time Valuation

The value assigned travel delay is another factor that significantly affects analysis results. There is extensive literature on this subject (“Travel Time Costs,” Litman 2009; Grant-Muller and Laird 2007; USDOT 2011). Most studies conclude that motorists are willing to pay, on average, 25-50% of wages to reduce congestion delay; for example, a motorist who earns \$16 per hour is typically willing to pay \$4-8 per hour or 7-14¢ per minute for marginal travel time savings. Some travelers (commercial vehicles and people with urgent errands) are willing to pay significantly more, but most travelers are price sensitive and would rather save money than time (Howard and Williams-Derry 2012; NCHRP 2006). It is economically inefficient to spend more to reduce congestion than users are willing to pay.

The U.S. Department of Transportation recommends valuing personal travel time at 50% of prevailing incomes (USDOT 2016). The 2019 UMR uses \$18.12 per hour (Ellis and Gover 2019), 33% more than the USDOT’s \$ 13.60 per hour default value, and probably more than average motorists are willing to pay for time savings. To justify these cost values Ellis and Glover cite one book published in 1976 and a report published in 1986; it includes no information on more recent travel time valuation research, nor does it mention of the USDOT’s travel time value guidance documents.

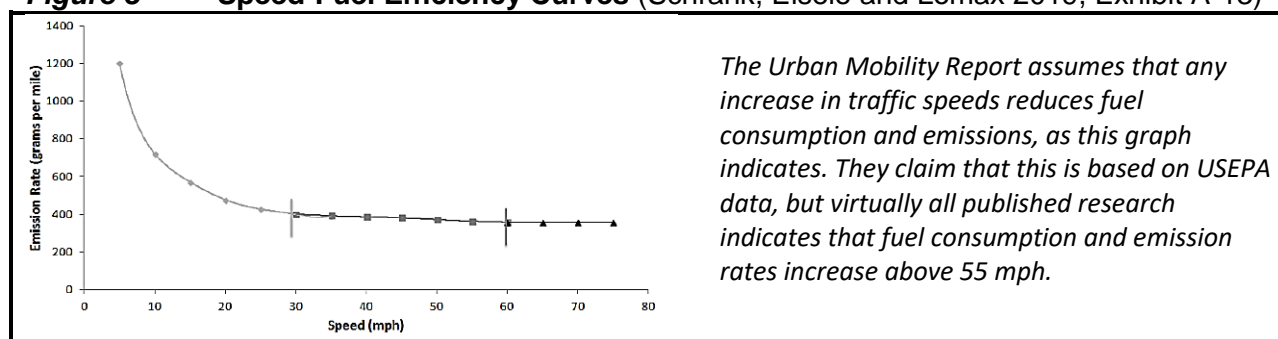
### *Fuel Consumption and Emission Impacts*

Another important congestion costing factor concerns the methods used to calculate how traffic speed changes affect vehicle fuel consumption and pollution emissions. Numerous studies indicate that fuel consumption and emission rates are minimized at 50 miles per hour (mph), and increase above 55 mph (Bigazzi and Figliozi 2012; ORNL 2012, Table 4.28), as indicated in figures 1 and 2.



The UMR uses a constantly declining speed-fuel-consumption curve (Figure 3), which assumes that any traffic speed increase reduces per mile fuel consumption and emissions. The UMR authors claim that this curve is based on the USEPA’s MOVES model, but most research indicate otherwise (figures 1 and 2). Despite enquiries, the UMR authors provided no more information about their emission model.

**Figure 3**      **Speed-Fuel Efficiency Curves (Schrunk, Eisele and Lomax 2019, Exhibit A-13)**



As a result, the UMR assumes that congestion reductions always provide environmental benefits. Most researchers conclude otherwise (Barth and Boriboonsomin 2009; Bigazzi and Figliozi 2012). They find that shifting from moderate congestion to free-flow speeds often increases per-mile fuel consumption and pollution emission rates, and by inducing additional vehicle travel often increases total fuel consumption and emissions (Noland and Quddus 2006; TØI 2009). Barth and Boriboonsomin (2009) explain, “If moderate congestion brings average speeds down from a free-flow speed over 70 mph to a slower speed of 45 to 55 mph, this moderate congestion can *reduce* CO<sub>2</sub> emissions. If congestion mitigation raises average traffic speed to above about 65 miles per hour, it can *increase* CO<sub>2</sub> emissions. And, of course, speeds above 65 or 70 also make the roadway more dangerous.”

### *Safety Impacts*

As the previous quote mentions, congestion reductions that lead to high traffic speeds can increase traffic casualties (Kockelman 2011; Marchesini and Weijermars 2010). Total crash rates tend to be lowest on moderately congested roads ( $V/C=0.6$ ) and increase at lower and higher congestion levels, while fatality rates increase when congestion is eliminated (Potts, et al. 2014; Zhou and Sisiopiku 1997). Per capita traffic deaths tend to increase with per capita vehicle travel, so roadway expansions that induce additional vehicle travel tends to increase traffic casualties (Luoma and Sivak 2012). Some congestion cost evaluations include an estimate of the increased crash costs that result from reduced congestion, which appear to offset 5-10% of congestion reduction benefits (Wallis and Lupton 2013).

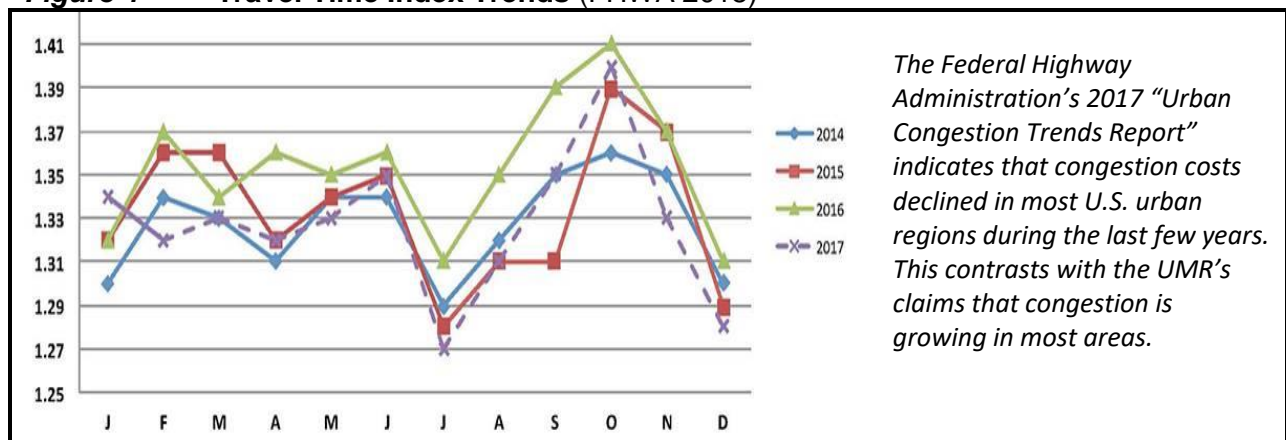
The UMR ignores this issue. It includes no discussion of the trade-offs between traffic speed and risk, the possibility that roadway expansion induced travel could increase per capita crash rates, or the well-documented safety benefits of other congestion reduction strategies such as public transit improvements, pricing reforms and smart growth land use (Litman and Fitzroy 2012; SSTI 2018).

### *Congestion Cost Predictions*

The UMR predicts that congestion costs will increase from \$166 billion in 2017 to \$200 billion in 2025. This is based on extrapolation of past traffic growth rates with no adjustment for demographic or economic trends that affect urban-peak traffic growth, or of new technologies and improved transport options that can reduce congestion costs. This prediction is almost certainly exaggerated.

Vehicle travel and traffic congestion grew steadily during the twentieth century, but per capita vehicle travel peaked in 2006 (Sivak 2018). In addition, new technologies are reducing congestion costs, for example, information systems allow travelers to anticipate and avoid congestion, and improved transport options (better walking and cycling conditions, rider-share and public transit services, telework and flextime, delivery services, etc.) let travelers avoid urban peak driving. Based on the sophisticated National Performance Management Research Data Set, the Federal Highway Administration’s 2017 *Urban Congestion Trends Report* (FHWA 2018) indicates that in 2017, congestion indicators (delay hours, travel time index and planning time index) improved significantly in most U.S. urban areas: 42% of 52 Metropolitan Statistical Areas (MSA) reported improvements in all three measures. The UMR includes no discussion of these issues or sensitivity analysis using alternative assumptions.

**Figure 4**      **Travel Time Index Trends (FHWA 2018)**



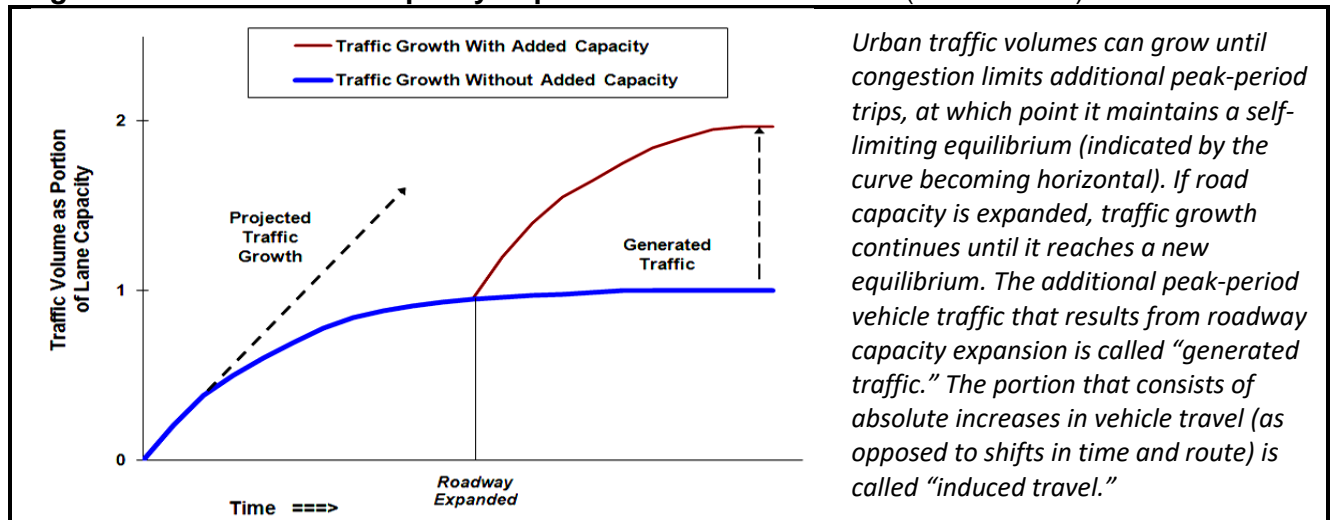
### *Vehicle Occupancy*

The 2019 UMR analysis assumes that private automobiles carry 1.5 average occupants when driving on congested roadways, much higher than the 1.13 occupancy of commute trips and a significant increase from the previously used 1.25 value (Lasley 2017). This increases estimated congestion costs by 20%. This seems unjustified because most driving on congested roadways consists of commuting.

### *Generated Traffic and Induced Travel*

Congestion impact analysis is complicated by the tendency of congestion to maintain equilibrium: it increases until delays cause some travelers to reduce peak-period trips by shifting travel times, routes, modes and destinations. As a result, expanded urban roadways often fill with latent demand (potential peak-period vehicle trips), leading to little or no reduction in congestion. Figure 5 illustrates this. The additional peak-period vehicle travel on an expanded roadway is called *generated traffic*, and net increases in total vehicle travel is called *induced travel* (Duranton and Turner 2011; Gorham 2009).

**Figure 5**      **How Road Capacity Expansion Generates Traffic** (Litman 2001)



These impacts have the following implications for congestion evaluation:

1. Traffic congestion seldom becomes as severe as predicted by extrapolating past trends. As congestion increases, it discourages further peak-period trips, maintaining equilibrium. Failing to expand urban roadways almost never leads to the *gridlock* people sometimes predict.
2. Roadway expansion provides less long-term congestion reduction benefits than predicted if generated traffic is ignored.
3. Induced vehicle travel increases various external costs, including downstream congestion, parking costs, accident risk, and pollution emissions, reducing net benefits.
4. Induced travel user benefits tend to be modest because it consists of marginal-value vehicle mileage that users are most willing to forego if their costs increase.

The UMR ignores of these issues. It predicts future traffic volumes by extrapolating past trends, assumes that roadway expansions can provide significant long-term congestion reductions, claims that induced travel external costs are insignificant (a statement on page A-30 acknowledges that induced travel could increase pollution, but assumes that impact is unimportant), and includes no consumer surplus analysis.

### *Congestion Intensity Versus Congestion Costs*

Some congestion indicators, such as *roadway level-of-service* and the *Travel Time Index* (TTI, the primary indicator used in the UMR), evaluate congestion *intensity*, the amount that traffic speeds decline during peak periods on particular roads. Other indicators, such as per capita delay, indicate actual costs. Intensity indicators may be suitable for some engineering analyses, such as for identifying where congestion is most severe in a road network, but are unsuited for evaluating overall transport system performance since they do not account for factors that affect travelers’ overall exposure to congestion, such as mode share or average trip length.

For example, a compact city could have a 1.3 Travel Time Index (during peak periods traffic speeds decline 30% compared with off-peak), 60% auto mode share and 10 kilometer average trip lengths, resulting in 34.3 annual hours of average delay per commuter; while a sprawled city has a 1.2 Travel Time Index, 90% automobile mode share and 15-kilometer average trip length, resulting in a much higher 45 annual hours of average delay per commuter (assuming 30 km/h average freeflow speeds). Intensity indicators consider the compact city to have worst congestion since it experiences greater peak-period speed reductions, although residents experience less total delay than in the sprawled city since they drive less during peak periods.

Described differently, congestion intensity reflects *mobility*, while congestion costs indicators reflect *accessibility*, people’s overall ability to reach destinations, taking into account both travel speeds and distances. Congestion intensity indicators only value walking, cycling, public transit and more compact development if they reduce automobile congestion, these indicators recognize no benefit to travelers who avoid congestion by shifting modes or choosing closer destinations. This is important because planning decisions often involve trade-offs between different forms of access, such as when road expansions degrade walking or stimulate sprawl, or when evaluating a bus lane that will increase transit passenger travel speeds but will not necessarily increase automobile traffic speeds.

Recent research improves our understanding of these trade-offs. For example, a major study by Levine, et al (2012) indicates that a change in development density affects the number of jobs and services available within a given travel time about ten times more than a proportional change in traffic speed. Kuzmyak (2012) found that roads in more compact neighborhoods experience considerably less traffic congestion than roads in less compact, suburban neighborhoods due to shorter trip distances, more connected streets, and better travel options. Levinson (2013) measured the number of jobs that could be reached by automobile within certain time periods for the 51 largest US metropolitan areas. He found that the five cities that the UMR ranks *worst* (Washington DC, Los Angeles, San Francisco, New York, Boston, and Houston) are among the *best* for automobile employment access, because their lower traffic speeds is more than offset by their shorter commute distances. Cortright (2010) found that roadway expansion that stimulates sprawl increases the total time residents spent traveling, because increased traffic speeds are more than offset by longer travel distances. These studies indicate that traffic speed often affects urban accessibility less than other factors, so congestion reduction strategies that delay other modes or stimulate sprawl tends to reduce overall transport system efficiency.

Various indicators are used to report and compare congestion impacts, as summarized in Table 4. Some, such as *roadway level-of-service* and the *Travel Time Index* (TTI) measure congestion intensity, while others are more comprehensive (they reflect total congestion costs, accounting for travel distances) and multi-modal (they consider delays to all travelers, not just motorists).

**Table 4**      **Congestion Indicators** (“Congestion Costs” Litman 2009)

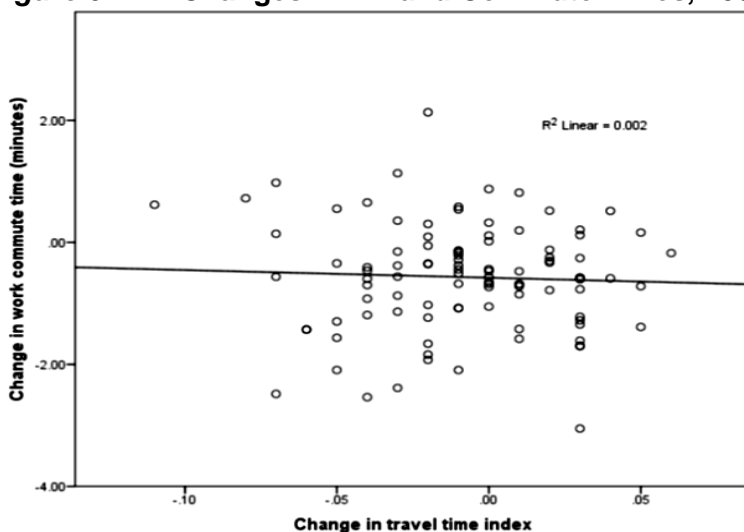
Indicator	Description	Comprehensive	Multi-Modal
Roadway Level-Of-Service (LOS)	Intensity of congestion on a road or intersection, rated from A (uncongested) to F (most congested)	No	No
Multi-modal Level-Of-Service (LOS)	Service quality of walking, cycling, public transport and automobile, rated from A to F	No	Yes
Travel Time Index	The ratio of peak to free-flow travel speeds	No	No
Avg. Traffic Speed	Average peak-period vehicle travel speeds	No	No
Avg. Commute Time	The average time spent per commute trip	Yes	Yes
Congested Duration	Duration of “rush hour”	No	No
Delay Hours	Hours of extra travel time due to congestion	Yes	No if for vehicles, yes if for people
Congestion Costs	Monetized value of delay plus additional vehicle operating costs	Yes	No if for vehicles, yes if for people

*Various indicators are used to evaluate congestion. Only a few are comprehensive and multi-modal.*

The UMR primarily reports congestion intensity rather than costs, and uses the terms *commuter* when the analysis only considers *automobile commuters*. For example, it indicates that San Francisco *automobile commuters* experienced 103 average annual delay hours, but since that region has only 53% of regional commuters drive, this averages just 55 hours per *commuter* overall. In contrast, Houston’s *automobile commuters* only experience 75 annual delay hours, but since it has an 80% auto mode share this averages 60 hours per *commuter*, higher than in San Francisco.

Sundquist and Holloway (2013) compared changes in the Travel Time Index with changes in residents’ commute duration (an indicator of overall accessibility), as indicated in Figure 6. The relationship was slightly negative: urban regions with increasing TTI ratings (congestion became more intense during the period) tended to have declining commuting times, indicating that the TTI is a poor indicator of overall accessibility (Levinson and King 2020; Sundquist, McCahill and Brenneis 2021).

**Figure 6**      **Changes in TTI and Commute Times, 2000-2010** (Sundquist and Holloway 2013)



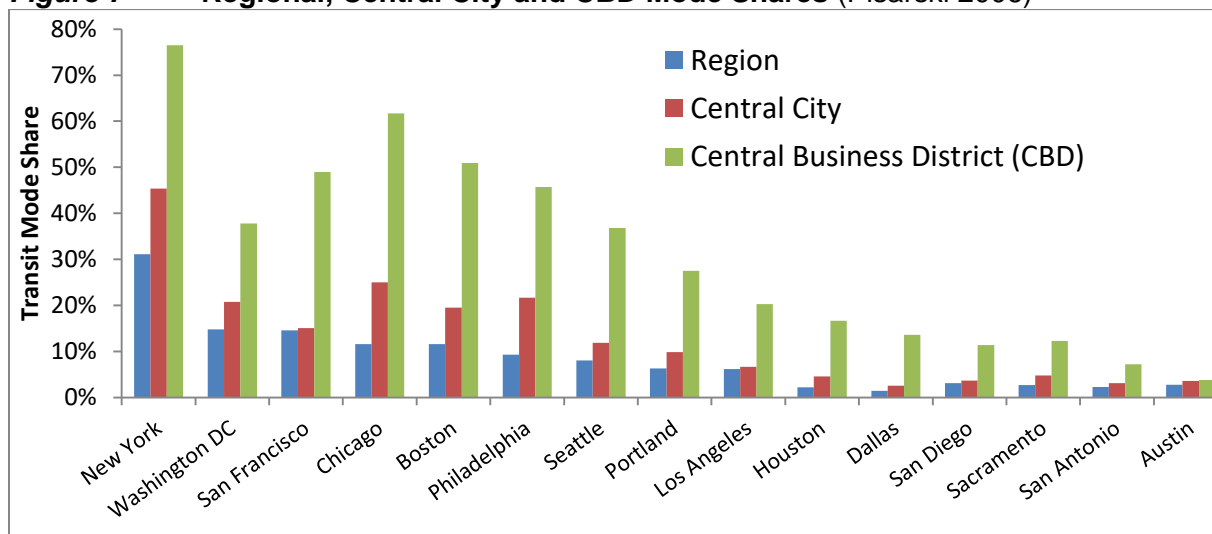
*Average commute travel times declined in urban areas with increased Travel Time Index (TTI) rating between 2000 and 2010. This indicates that the TTI is a poor indication of overall accessibility.*



### *Summary of UMR Congestion Costing Methods*

The UMR’s congestion costing methods fail to reflect best practices. It uses baseline speeds that are higher than what is legal or efficient, its travel time values are higher than average motorists would willingly pay for travel time savings, it exaggerates roadway expansion fuel savings and emission reductions, and exaggerates future congestion problems. It only considers impacts on motorists although other modes are a major share of trips on congested corridors (large city CBDs, as illustrated below), and so can have large impacts on total travel times and congestion delays.

**Figure 7**      **Regional, Central City and CBD Mode Shares (Pisarski 2006)**



*Although transit is typically just 1-3% of total regional mode share, it represents a larger portion of urban commuting (typically 5-10%) and an even greater share (typically 10-50%) of peak-period travel to major activity centers such as central business districts (CBDs) and campuses.*

Since planning decisions often involve trade-offs between congestion reductions and other objectives, these practices tend to overvalue roadway expansions and undervalue other congestion reduction strategies, resulting in a transport system that is more automobile-dependent, unfair to non-drivers, costly, dangerous and polluting than residents want.

Due to these omissions and biases, the UMR’s congestion cost estimates should be considered upper-bound values. Other major studies provide much lower estimates. For example, the FHWA’s *Urban Congestion Trends* found that congestion costs declined in most cities in 2017. INRIX estimated that U.S. congestion costs totaled \$87 billion, about half of the UMR (INRIX 2019). Figure 8 compares the UMR’s \$121 billion cost estimate, based on a free-flow speed baseline and \$16.79 per hour time costs, with a middle-range value based on 70% baseline and \$12 per hour value, and a lower-range value based on a 50% baseline and \$8.37 per hour. Even these tend to exaggerate the benefits of congestion reduction strategies that increase traffic speeds over 55 mph, which tends to increase fuel, pollution and accident costs, or if strategies induce additional vehicle travel. This range can be used for sensitivity analysis.

**Figure 8 Congestion Cost Ranges**

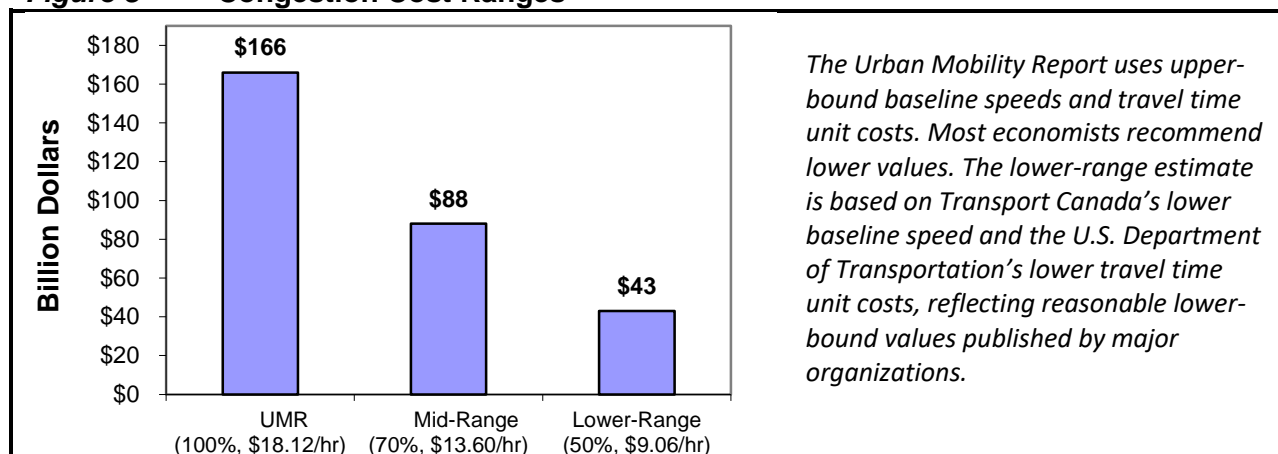


Table 5 summarizes best congestion costing practices and how they are reflected in the UMR.

**Table 5 Congestion Costing Best Practices**

Factor	Recommended Best Practices	UMR Practices
Modes considered	Consider impacts on all modes	Generally ignores impacts non-auto modes. Often refers to “commuters” when the analysis only counts automobile commuters.
Baseline speeds	Capacity or economic efficiency optimizing speeds.	Uses freeflow speeds, 30-50% higher than most experts recommend, which often exceed legal speed limits. No discussion of this issue.
Travel time valuation	25-50% of average wages; USDOT recommends \$8.37 to \$14.34 per hour.	Uses \$16.79 per hour based on 1986 Texas study. No discussion of why this was chosen over USDOT recommended values.
Fuel consumption and emission impacts	Recognize that fuel consumption and emissions are lowest at 45-55 mph.	Assumes any traffic speed increase reduces fuel consumption and emission rates.
Safety impacts	Recognize that increasing traffic speeds can increase crash casualty rates.	Ignores this impact.
Future congestion costs	Account for demographic and economic factors that affect future congestion costs.	Extrapolates growth without considering demographic trends or new transport options.
Generated traffic and induced travel impacts	Recognize that roadway expansions often provide little long-term congestion reduction and increase external costs.	Ignores generated traffic and induced travel impacts.
Congestion intensity versus costs	Primarily use per capita congestion costs instead of congestion intensity indicators.	Emphasizes congestion intensity indicators for most comparisons.

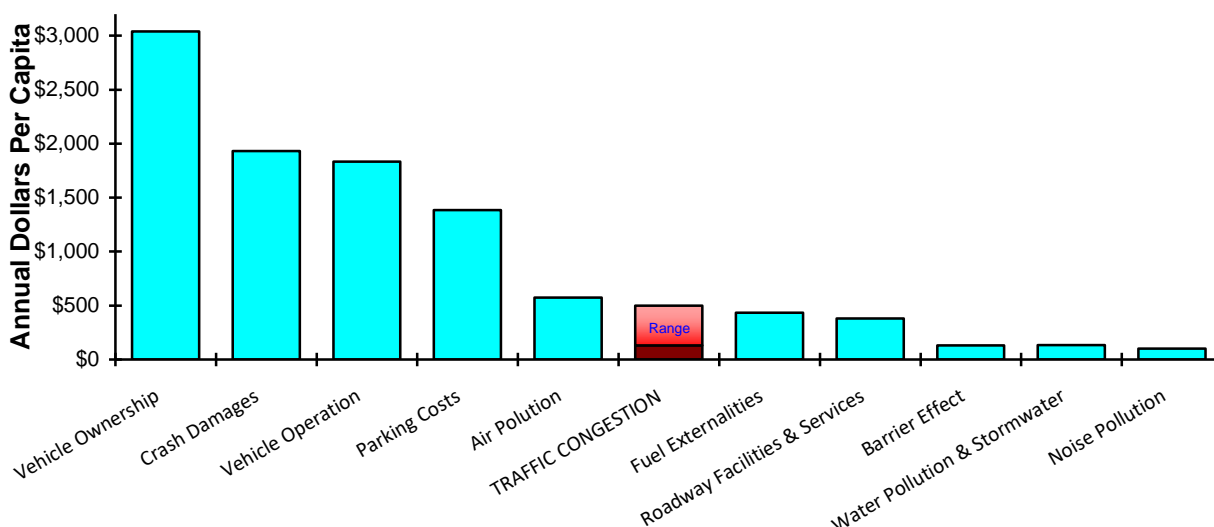
*In various ways the UMR fails to reflect best current congestion evaluation practices. Its cost estimates should be considered upper-bound values.*

## Comparing Congestion with Other Costs

The UMR states that traffic congestion wastes “massive” amounts of time and fuel worth an estimated \$166 billion in 2017. These numbers may seem large, but are modest compared with total motor vehicle costs: they represent an increase of less than 2% of total travel time and fuel costs, which is small compared with other factors that affect the time and money people spend on transport. For example, sprawled development can increase residents’ travel time and vehicle costs by 20-40% (Cortright 2010).

Several studies have monetized transport costs (CE, INFRAS, ISI 2011; Kockelman, Chen and Nichols 2013; Litman 2009; TC 2008). Figure 8 compares these cost estimates. Congestion cost estimates range from \$130 (50% baseline speeds and \$9.06 per hour time costs) up to \$500 (the UMR’s estimate) annual per capita, compared with approximately \$3,000 in vehicle ownership costs, \$2,000 in crash damages, \$1,800 in parking costs, \$600 in pollution damage costs, and \$400 in roadway costs. This indicates that congestion is a modest cost overall, larger than some but smaller than others.

**Figure 9** Costs Ranked by Magnitude (Litman 2009)<sup>1</sup>



*U.S. traffic congestion cost estimates range between about \$130 and \$500 annual per capita, depending on assumptions. These are modest compared with other transportation costs.*

The fact that there is little support by motorists for decongestion pricing or major tax increases to finance roadway expansion is empirical evidence that they do not really consider congestion a major cost; consumer willingness-to-pay is apparently much lower than the UMR indicates.

Because congestion is just one of many costs, it is inappropriate to evaluate congestion reduction strategies in isolation; a strategy is worth far less overall if it increases other costs and for more if it provides co-benefits. For example, an urban roadway expansion project may seem cost effective considering congestion impacts alone, but not if it induces additional vehicle trips that increase parking problems, accidents and pollution emissions. Conversely, alternative mode improvements may not seem efficient considering congestion reductions alone, but are cost effective overall considering co-benefits (parking cost savings, safety, and improved mobility for non-drivers, etc.).

<sup>1</sup> Transportation Cost Analysis Spreadsheet ([www.vtpi.org/tca/tca.xls](http://www.vtpi.org/tca/tca.xls)), 8% inflation, 9,548 annual MVT per capita.

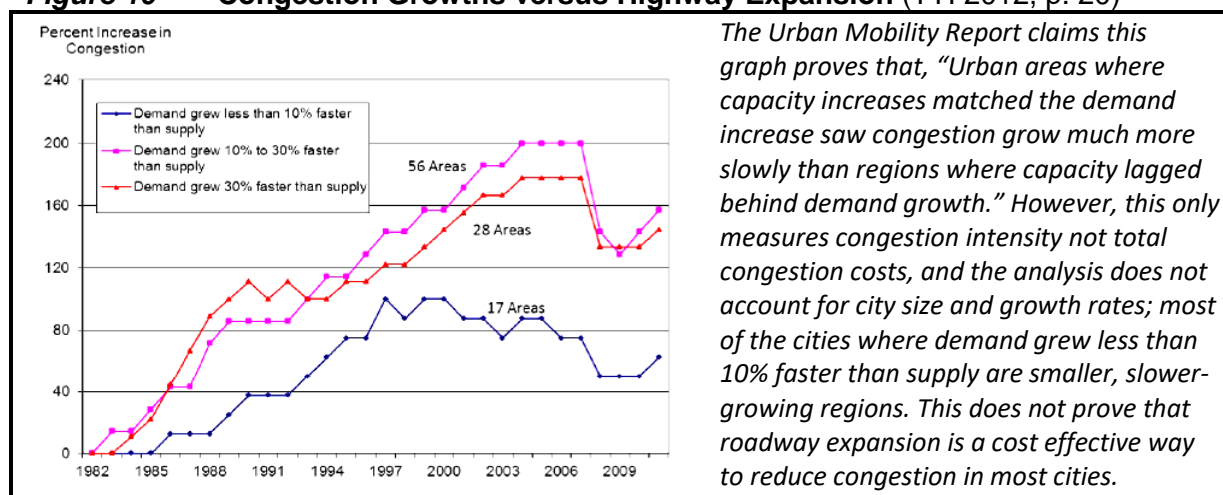
## Evaluating Potential Congestion Reduction Strategies

There is considerable debate as to which congestion reduction strategies are most effective and beneficial overall. As discussed previously, expanding congested roadways often provides only modest and short-term congestion reductions because the additional capacity fills with latent demand, leading to generated travel (Duranton and Turner 2011; Gorham 2009; Litman 2001).

The UMR ignores induced travel impacts (on page A-28 of the Appendix it mentions the possibility that induced travel may increase vehicle omissions but dismisses its importance), and ignores other impacts, besides traffic congestion, such as consumer costs, parking costs, accident rates and pollution emissions, although these are critical transportation planning issues (Melo, Graham and Canavan 2012).

The UMR has been criticized for exaggerating roadway expansion congestion reduction benefits (STPP 1999). In response, the UMR presents the graph copied below to argue that highway expansions do reduce congestion: cities with relatively more roadway expansion experienced less congestion growth than those with relatively less roadway expansion. However, that analysis failed to account for other factors that affect congestion, such as differences in city size and economic growth, and the analysis measured congestion intensity instead of total congestion costs, and so did not account for increased delays caused by sprawl.

**Figure 10** Congestion Growths versus Highway Expansion (TTI 2012, p. 20)



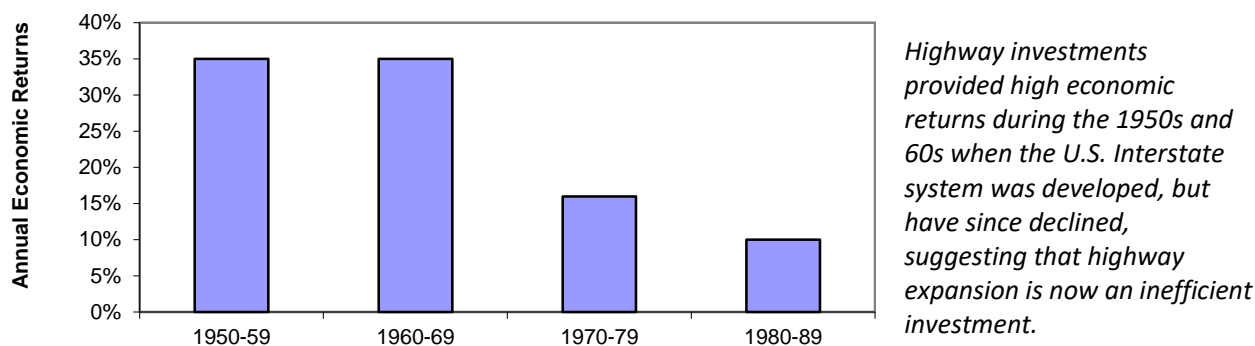
*The Urban Mobility Report claims this graph proves that, “Urban areas where capacity increases matched the demand increase saw congestion grow much more slowly than regions where capacity lagged behind demand growth.” However, this only measures congestion intensity not total congestion costs, and the analysis does not account for city size and growth rates; most of the cities where demand grew less than 10% faster than supply are smaller, slower-growing regions. This does not prove that roadway expansion is a cost effective way to reduce congestion in most cities.*

The UMR claims that (p. 19), “The mix of solutions that are used is relatively less important than the amount of solution being implemented” and recommends “a balanced and diversified approach to reduce congestion – one that focuses on more of everything.” As a result, the UMR authors claim that they are inclusive and do not favor any particular congestion reduction strategy. However, these statements reflect a narrow perspective that ignores significant impacts and biases in the UMR (Litman 2014). For example, these statements imply that urban highways should be expanded without considering whether they are most cost effective overall, considering all impacts, including the additional costs resulting from induced vehicle travel. A rational and conservative congestion reduction program would only implement the most effective and beneficial strategies, considering all impacts, rather than “more of everything.” Other studies, described later in this report, recommend improvements to space-efficient modes and pricing reforms rather than urban roadway expansions.

## Economic Development Impacts

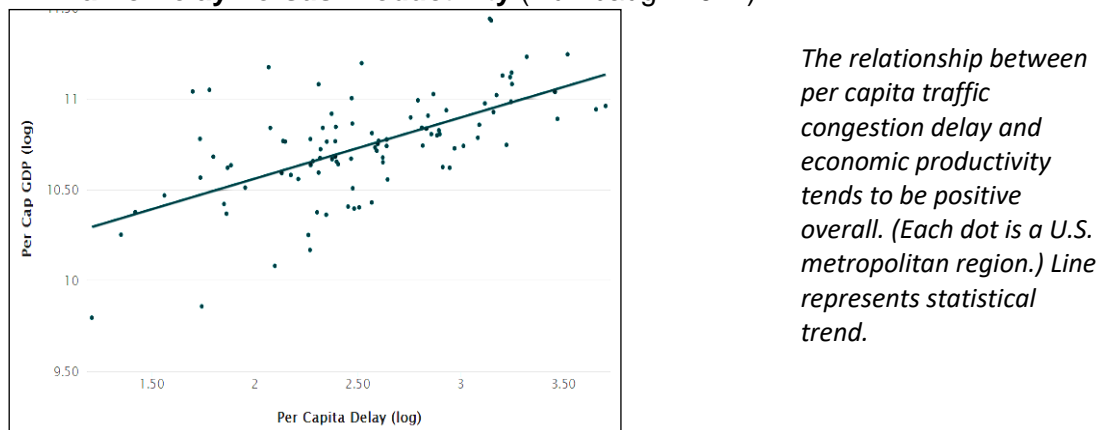
The UMR predicts large economic productivity gains from congestion reduction strategies, including roadway expansions. However, there is considerable theoretical and empirical evidence that where roadway systems are mature, additional expansions provide little productivity gains (Iacono and Levinson 2013). Nadiri and Mamuneas (2006) found that highway investments had high economic returns during the 1950s and 60s, but these declined once the Interstate Highway system connected most regions, as indicated in Figure 11. Subsequent research by Eberts (2009) found similar trends.

**Figure 11 Annual Highway Rate of Return (Nadiri and Mamuneas 2006)**

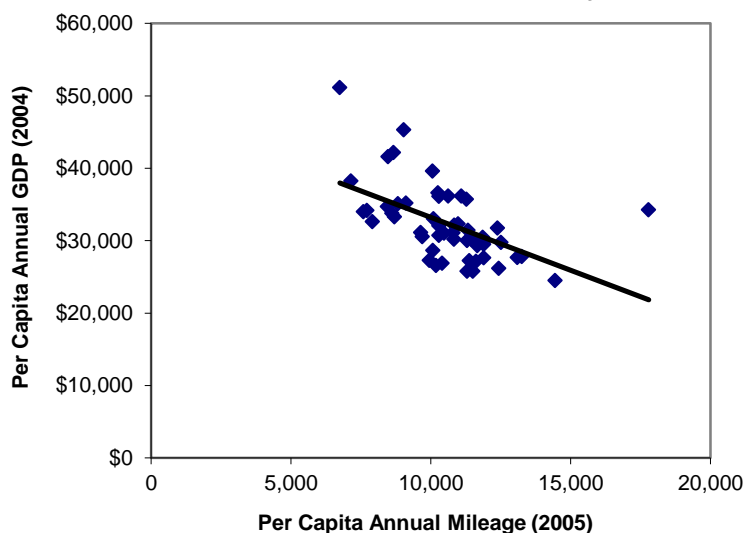


In a study of U.S. cities, Sweet (2013) found evidence that congestion delays that exceed 4.5 minutes per one-way commute reduces employment but no evidence that it impedes per-worker productivity. Dumbaugh (2012) found *positive* relationships between traffic congestion and economic productivity, and Litman (2010) found negative relationships between regional vehicle travel or roadway supply and productivity (figures 12-14). This does not mean that congestion increases productivity; rather, it suggests that congestion costs are small compared with other factors that affect accessibility and transport costs. As previously described, land use density and mix tend to affect access more than travel speed (Levine, et al. 2012). As well, households located in more automobile-oriented communities tend to own more vehicles, drive more, spend more time traveling, have higher per capita crash rates, and spend a greater portion of their income on transport than otherwise comparable households in more compact, multi-modal communities (CTOD and CNT 2006; Litman 2011).

**Figure 12 Traffic Delay Versus Productivity (Dumbaugh 2012)**



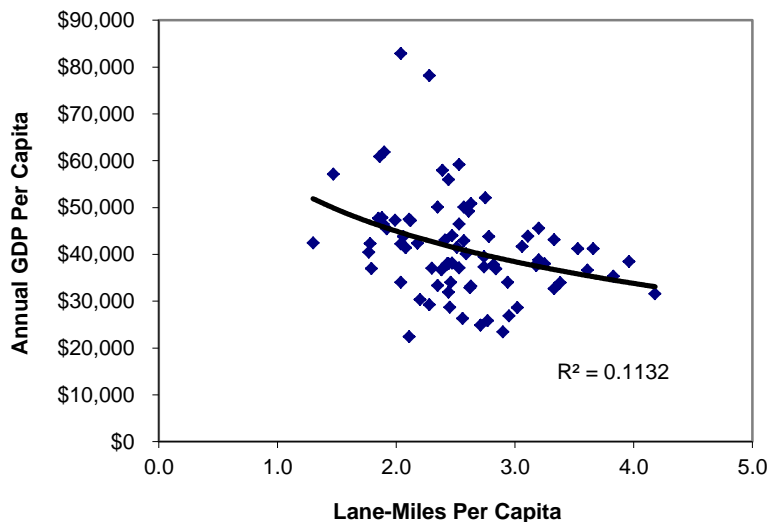
**Figure 13 Vehicle Travel Versus Productivity**



*The relationship between per capita vehicle travel and regional economic productivity tends to be negative overall. (Each dot is a U.S. state.)*

*Data from the FHWA "Highway Statistics Report" the "Urban Mobility Report" and the Bureau of Economic Account's "Gross Domestic Product By Metropolitan Area."*

**Figure 14 Roadway Supply Versus Productivity (VTPI 2009)**



*The relationship between roadway supply and regional economic productivity tends to be negative overall. (Each dot is a U.S. urban region.)*



## Expert Recommendations and Criticisms

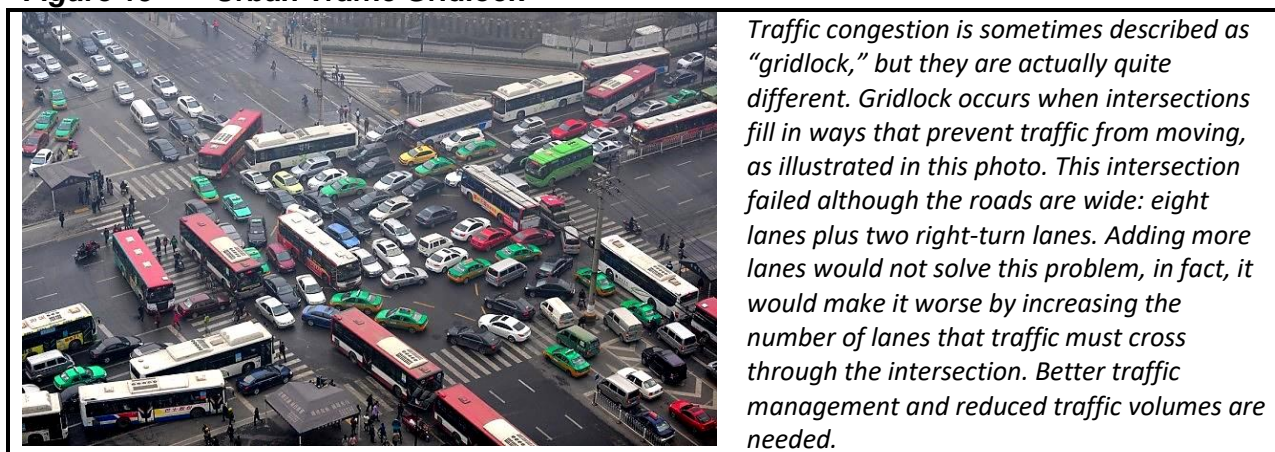
Several recent studies provide recommendations for congestion costing best practices, some of which specifically criticize the UMR’s methodologies.

- *You Are the Traffic Jam: An Examination of Congestion Measures* (Bertini 2006). Reviews congestion cost definitions and measurement methods. Of 480 transportation practitioners who responded to a survey approximately half indicated that current congestion evaluation methods are inadequate and more comprehensive methods are needed.
- *Driven Apart: How Sprawl is Lengthening Our Commutes and Why Misleading Mobility Measures are Making Things Worse* (Cortright 2010). Discusses ways to measure urban transport performance and criticizes the UMR for applying mobility-based evaluation which ignores other accessibility factors. Other columns (Cortright 2011 and 2019) further criticize the UMR for failing to address previously-identified omissions and biases.
- *International Literature Review of the Costs of Road Traffic Congestion* (Grant-Muller and Laird 2007). Provides an extensive review of congestion costing methods. It discusses criticisms of freeflow baseline speeds (what it calls *total cost of congestion approach*) and recommends efficient baseline speeds that reflect motorists’ willingness-to-pay for faster travel (which it calls *excess burden of congestion approach*), and emphasizes the importance of considering induced travel impacts.
- The International Transport Forum’s *Decongesting Our Cities* report (ITF 2021) evaluates various congestion reduction strategies and recommends various TDM strategies, including decongestion pricing, efficient parking management, road space reallocation, and improvements to space-efficient modes, rather than roadway expansions.
- *The Costs of Congestion Reappraised* (Wallis and Lupton 2013). Evaluates congestion definitions and costing methods for use in New Zealand. It discusses differences between engineering-based methods that use freeflow baseline speeds, and economic-based methods which reflect users’ willingness-to-pay for faster travel. It recommends the economic method. It estimates that Auckland’s annual congestion costs total \$250 million using its recommended methodology, approximately a fifth of the \$1,250 million estimate based on freeflow speeds.
- *The Cost of Urban Congestion in Canada* (TC 2006). Develops congestion cost indicators for Canadian urban areas. Reviews relevant literature and discusses differences between engineering and economic methods. It selects the engineering approach as most practical but argues that freeflow baseline speeds are arbitrary and excessive, and so calculates congestion costs based on 50%, 60% and 70% of free-flow, reflecting what it considers more economically efficient speeds. Its fuel and emission curves increase at high traffic speeds.
- *Transportation Cost and Benefit Analysis; Techniques, Estimates and Implications* (Litman 2009). Comprehensive study of various transportation costs, including congestion. It discusses and compares various congestion cost definitions and estimates. *Smart Congestion Relief: Comprehensive Analysis of Traffic Congestion Costs and Congestion Reduction Benefits* (Litman 2021). Uses a comprehensive framework to evaluate various congestion reduction strategies.
- *Does the Travel-Time Index Really Reflect Performance?* (Sundquist and Holloway 2013). Finds no significant relationship between changes in the UMR’s travel time index and changes in average commute times for 100 U.S. urban regions. Recommends alternative performance indicators.
- The FHWA’s *Urban Congestion Trends* found that congestion costs declined in most cities in 2017.
- INRIX estimated that U.S. congestion costs totaled \$87 billion, about half of the UMR (INRIX 2019).

The UMR is exceptional among major recent congestion cost studies because it lacks contextual information: it includes no literature review, does not discuss the merits of potential methodologies or explain its assumptions, does not discuss its potential biases, and includes no sensitivity analysis. The UMR directs readers to a *Resources* (<http://mobility.tamu.edu/resources>) web page for information on its methodologies, but there is no discussion of *why* specific methods and input values were chosen, and it provides few specific citations.

The UMR has not acknowledged or responded to legitimate peer criticism. The UMR authors might challenge this statement; for example, they might cite Tim Lomax’ 9-page paper, *Congestion Measurement in the Urban Mobility Report: Response to Critique by Mr. Todd Litman* (<http://tti.tamu.edu/documents/TTI-2013-4.pdf>). It is a helpful contribution to this dialogue but is vague and incomplete. It does not respond to many legitimate criticisms, and the 2019 edition includes less information, such as peak and off-peak traffic speeds, than in previous versions.

**Figure 15**      **Urban Traffic Gridlock**



Traffic congestion is sometimes described as “gridlock,” but they are actually quite different. Gridlock occurs when intersections fill in ways that prevent traffic from moving, as illustrated in this photo. This intersection failed although the roads are wide: eight lanes plus two right-turn lanes. Adding more lanes would not solve this problem, in fact, it would make it worse by increasing the number of lanes that traffic must cross through the intersection. Better traffic management and reduced traffic volumes are needed.

## Summary of Impacts on Planning Decisions

Table 6 summarizes its various omissions and biases and their likely impacts on planning decisions. These tend to skew results toward overestimating congestion costs and roadway expansion benefits, and undervaluing other types of transport improvement strategies.

**Table 6**      **Impacts of Omissions and Biases on Planning Decisions**

Omissions and Biases	Impacts on Planning Decisions
Lacks a current literature review and so fails to identify best current congestion evaluation practices.	Prevents readers from understanding the report’s context and potential biases.
Fails to explain its assumptions.	Prevents readers from understanding the study’s methods or from replicating, critiquing and building on its analysis.
Assumes that <i>transportation</i> means automobile travel. Uses “commuter” when only automobile travel is measured.	Undervalues non-automotive modes. Skews planning decisions to favor roadway improvements over other types of transport improvements.
Ignores important accessibility factors and impacts, including the quality of non-automobile modes, transport network connectivity and land use proximity.	Favors roadway expansion over other accessibility improvements such as improving alternative modes, network connectivity and land use proximity.
Uses baseline speeds and travel time values higher than most economists recommend.	Exaggerates congestion costs.
Fails to compare congestion with other transport costs. Calls congestion costs “massive,” although they increase travel time and fuel consumption 2% at most.	Exaggerates congestion costs relative to other economic impacts, and therefore congestion reduction compared with other planning objectives
Ignores induced travel impacts.	Exaggerates roadway expansion benefits relative to other transportation improvement strategies.
Uses a constantly declining speed-emission curve.	Exaggerates roadway expansion fuel saving and emission reductions.
Ignores demographic and economic trends which are reducing motor vehicle traffic growth and increasing demand for alternative modes.	Exaggerates future congestion problems and long-term roadway expansion benefits.
Ignores positive trends, including recent declines in congestion, improved technologies and travel options that allow travelers to avoid congestion.	Exaggerates future congestion problems and the benefits of urban roadway expansions.
Lacks independent peer review.	Reduces the study’s ability to identify and correct omissions and biases in analysis.
Ignores criticism.	Reduces the study’s contribution to the profession’s dialogue concerning best congestion costing practices.

*The Urban Mobility Report contains various omissions and biases which affect planning decisions.*

## Conclusions

Planners, decision-makers and the general public need credible information on congestion costs and the effects of potential congestion reduction strategies. The Urban Mobility Report provides widely cited congestion cost estimates and solutions, but its analysis is neither comprehensive nor objective.

The UMR does not reflect best congestion costing methods: it uses higher baseline speeds and travel time unit cost values than experts recommend; exaggerates fuel savings and emission reductions; ignores incremental accident risk and generated traffic impacts. As a result, it overestimates congestion costs and roadway expansion benefits, and undervalues other congestion reduction strategies that provide additional benefits (besides congestion reductions). The UMR’s congestion cost estimates represent upper-bound values, and are much higher than results using more realistic assumptions.

The UMR also ignores basic research principles. It contains no literature review, fails to explain many assumptions or cite sources, does not discuss criticisms or potential biases, has no sensitivity analysis, and lacks independent peer review. It fails to give readers the information they need to understand its results. For example, it ranks compact, multi-modal cities such as Boston, New York and Washington DC as having worst congestion than more sprawled, automobile-dependent cities such as Atlanta, Houston and Miami, but fails to mention that this ranking reflects congestion costs measured per *motorist*, and if measured per *commuter*, multi-modal urban regions tend to rate much better due to their low automobile mode shares. Similarly, multi-modal regions tend to rank better than sprawled, automobile-dependent areas if measured based on access to jobs and services, or per capita transportation costs.

These biases are significant because planning decisions often involve trade-offs between different solutions. For example, road space can either be used for general traffic lanes or bus lanes, and money spent to expand roads is unavailable for other purposes. By exaggerating congestion costs relative to other impacts and ignoring generated traffic impacts, the UMR tends to overvalue urban roadway expansions and undervalue other congestion reduction strategies that provide more co-benefits. For example, it ignores the parking cost savings, consumer savings, increased savings and reduced pollution provided by improvements to non-auto modes, efficient pricing and TDM programs.

The UMR’s approach reflects an older planning paradigm. Many planning professionals and jurisdictions are shifting from mobility-based indicators, such as roadway Level-of-Service (LOS) and the Travel Time Index to accessibility-based performance indicators such as average commute duration and job access by various modes. Many jurisdictions have vehicle travel reduction targets, and so are replacing LOS with VMT (Vehicle Miles Travelled) indicators, assuming that less is better (Lee and Handy 2018). For example, California state law targets a 15% reduction in VMT by 2050 (GOPR 2018), and Washington State has even more ambitious targets to reduce per capita VMT 25% below by 2035 and 50% by 2050 (WSL 2008). Many cities also have VMT reduction targets (ACEEE 2019; Litman 2020). A report which assumes that automobile congestion is the greatest urban transportation problem, ignoring other planning goals and impacts, is increasingly outdated.

This Critique does not deny that traffic congestion is a problem and congestion reduction is an important planning goal. However, congestion is only one of several impacts that should be considered in planning and is not usually the most important. It is therefore important to apply comprehensive evaluation of these impacts. The UMR fails to explore these issues. More comprehensive and objective analysis is needed to identify truly optimal congestion solutions.

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