

## Report Outline:

- What is LOS?
  - How it is used in NYC
  - Relationship between LOS, CEQR/SEQRA
  - Historicize HCM & LOS
- City's current interest and openness to reworking LOS (BLAST)
- Harms/consequences of LOS
- Place precedents that are changing their LOS standards
  - Florida
  - Met Council
  - Washington
  - California, SB743
- Tiered interventions
  - Tier 1: Houston's system
  - Tier 2: VMT (California)
- Tier 3: Overhaul: a need for more holistic planning

## Acknowledgements

I would like to thank Sara Lind and Michael Sutherland for their insight and guidance throughout the research and creation of this report. The multi-modal design approaches developed by Khang Nguyen, David Fields, and others at Houston's Department of Transportation offered a guidepost early on in the research process. Christine Berthet's enduring commitment to the quality of experience on the street has served as an inspiration. Mike Flynn and Jeff Smithline of the transportation consulting firm, Sam Schwartz, offered technical and philosophical guidance at the 11th hour. Thank you!

## What is LOS?

Level of Service is the standard used for assessing the impacts a proposed land use change would have on local transportation conditions. While Level of Service is the most common standard used by transportation departments across the United States, many cities and states are amending or creating their own standards to reflect their values and priorities.

LOS was first conceived as part of the 1965 Highway Capacity Manual (HCM), approved by the Federal Highway Administration.<sup>12</sup> This early version of the manual was produced during the United States' great suburbanization project and as the manual's title indicates, the *Highway Capacity Manual* [my emphasis] was unilaterally concerned with the quality and efficiency of travel for the automobile driver. Level of Service was first defined in this prototypal document as, "a qualitative measure of the effect of a number of factors,

---

<sup>1</sup> Roger Roess, "Level of Service Concepts: Development, Philosophies, and Implications," *Transportation Research Board*, no. 971 (1984): 1.

<sup>2</sup> U.S. Department of Transportation Federal Highway Administration, *Manual on Uniform Traffic Control Devices* (2009), i, <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2r3/r1r2r3covintrotoc.pdf>.

which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating cost.”<sup>3</sup> Over the years, and with increasing awareness of the climate impacts of fossil fuel reliance, this definition has taken on a wider aperture, evaluating street conditions based on more than just reducing congestion and the conditions for drivers. In the most recent HCM, Level of Service was described this way, “A quantitative stratification of a performance measure or performance measures that represent quality of service measured on an A-F scale with LOS A representing the best operating conditions from the traveler’s perspective and LOS F the worst.”<sup>4</sup>[see table below] That version of the HCM also incorporated Multi Modal Level of Service, broadening its evaluation guidelines beyond the traditional traffic analysis.

Level of Service	General Operating Conditions
A	Free flow, with low volumes and high speeds.
B	Reasonably free flow, but speeds beginning to be restricted by traffic conditions.
C	Stable flow, but most drivers are restricted in the freedom to select their own speeds.
D	Approaching unstable flow; drivers have little freedom to select their own speeds.
E	Unstable flow; may be short stoppages.
F	Forced or breakdown flow; unacceptable congestion; stop-and-go.

From A Policy on Geometric Design of Highways and Streets, as adapted by the U.S. Department of Transportation.

In New York, Level of Service is the standard used in the City Environmental Quality Review (CEQR) that the City Planning Commission requires most discretionary land use proposals to undergo for approval. CEQR is New York City’s version of the State Environmental Quality Review Act (SEQRA), which was created in response to the federal government’s passage of the National Environmental Policy Act (NEPA) in 1969.<sup>5</sup> CEQR casts a wide net when considering environmental impacts, assessing the following nineteen areas: land use, zoning/public

policy, socioeconomic conditions, community facilities/services, open space, shadows, historic and cultural resources, urban design and visual resources, natural resources, hazardous materials, infrastructure, solid waste/sanitation services, energy, transportation, air quality, greenhouse gas emissions, noise, public health, neighborhood character, and construction impacts.

However, despite the ambitious goals of the CEQR process, that seem to aspire towards a holistic approach to environmental review, one significant issue is its siloed approach to environmental review. This is especially the case when it comes to the transportation section where the Level of Service standard appears. Evaluating air quality, greenhouse gas emissions and transportation separately allows for the mystifying outcome of a review process—ostensibly in service of protecting the environment—producing recommendations to widen roads so as not to impede the efficient movement of fossil fuel dependent vehicles, as has notoriously been

<sup>3</sup> Roess, “Level of Service Concepts,” 1.

<sup>4</sup> U.S. Department of Transportation, “Evolving Use of Level of Service Metrics in Transportation Analysis - Introduction,” (2017): 2,

<https://www.transportation.gov/office-policy/transportation-policy/evolving-use-level-service-metrics-transportation-analysis>.

<sup>5</sup> “Environmental Review Process,” Department of City Planning, accessed July 6, 2023,

<https://www.nyc.gov/site/planning/applicants/environmental-review-process.page>.

the case.<sup>678</sup> Yet, however bad this may make the architects of the CEQR process appear, it is rather more like a feature of urban planning than an enigma unique to the CEQR process.

In general, the guidelines offered for each transportation mode are carefully considered. For instance, when analyzing LOS for subway platforms, attention is given to the variance in crowding along different areas of the platform in relation to stairwells and other variables. With this in mind, the guideline outlines how the platform analysis should be carried out to factor in these variables and arrive at an accurate judgment of the actual platform conditions.<sup>9</sup> This seems to indicate New York City's application of level of service is deserving of its "multi-modal" title.<sup>10</sup>

Let's look for a moment at the CEQR guideline for analyzing existing bus transit conditions. Two considerations are outlined: 1) The analysis of existing bus transit conditions presents bus load level and loading conditions on the routes serving the site of the proposed project to determine whether or not there is capacity available to accommodate additional project-generated trips, and 2) For the routes and stops identified as the bus transit study area, these analyses entail the assembly and/or collection of bus ridership data at the bus stops most closely serving the project site and at the route's "maximum load point," and an analysis of bus loading levels versus their physical capacities.<sup>11</sup>

This description reads thoughtful enough. It considers the quality of experience inside the bus to help determine the capacity to accommodate projected ridership in the future. Yet, as Roger Poess notes in his essay *Level of Service Concepts: Development, Philosophies, and Implications*, this is just one part of the bus rider's experience. The other part, which is equally, if not more important, is the speed at which the bus is able to move. Poess writes, "Transit level of service is a two-dimensional issue, dealing with the internal environment of the transit vehicle and the traffic environment of the vehicle itself. A bus, for example, can be traveling at free flow speed on an uncongested highway but be loaded with many standees, thereby providing a low level of service. Conversely, a lightly loaded bus can provide an excellent internal environment but be stuck in a traffic stream operating at level of service F."<sup>12</sup>

Additionally, when compared to its equivalent in the vehicular LOS section of the manual, it is considerably less detailed; less than half as many pages are dedicated to the subway and bus analysis guidelines,

---

<sup>6</sup> Melanie Curry, "The Next Step in Getting Rid of Level of Service: Coming Soon" *Streetsblog California*, October 9, 2015, <https://cal.streetsblog.org/2015/10/09/the-next-step-in-getting-rid-of-level-of-service-coming-soon>.

<sup>7</sup> Camille Fink, "Level of Service, the Wrong Performance Measure," Planetizen, March 29, 2019, <https://www.planetizen.com/news/2019/03/103599-level-service-wrong-performance-measure>.

<sup>8</sup> "What Is LOS?," Planetizen, accessed June 16, 2023, <https://www.planetizen.com/definition/level-service>.

<sup>9</sup> Hilary Semel et al., "City Environmental Review Process Technical Manual" (December 2021), 16-43, [https://www.nyc.gov/assets/oec/technical-manual/2021\\_ceqr\\_technical\\_manual.pdf](https://www.nyc.gov/assets/oec/technical-manual/2021_ceqr_technical_manual.pdf)

<sup>10</sup> However, important to note, the CEQR manual doesn't actually use the term Multimodal LOS, in fact, it doesn't actually refer to Level of Service all that directly or often in the manual. For example, instead of "Vehicular LOS", that section is called "Analysis of Roadway Capacity and Level of Service" and instead of "Subway LOS," that section is called "analysis of line-haul capacity and level of service." Semel, Hilary, et al. "City Environmental Review Process Technical Manual," 16-46.

<sup>11</sup> Ibid, 16-44.

<sup>12</sup> Roess, "Level of Service Concepts," 5.

and while wordcount doesn't necessarily indicate the effectiveness of the guideline, it might indicate that transit analysis receives a relatively less robust metric.

It might also even be the case that the CEQR technical manual urges for more thorough and discriminating procedures than those that are actually carried out. During a meeting responding to community calls for a two way protected bike lane on Central Park West after a cyclist was killed in 2018, Ted Wright, director of the DOT Bicycle and Greenway Program, offered this mystifying explanation for DOT's significantly less ambitious proposal, "If we changed things along this corridor drastically, you'd have backups that would go onto other streets. We've basically tried to keep traffic almost as it is—maybe a bit worse at some locations, but basically the same."<sup>13</sup>

What are we to make of this? Does this indicate a type of oversight that happens here and there but isn't indicative of a general disregard for multimodal concerns? Or is it indeed revealing a true incongruence between what is on the books and what is happening in reality? Jeff Smithline and Mike Flynn, of the transportation planning firm Sam Schwartz, note that while the current CEQR manual is technically multi modal, the lack of integration between the different modal analyses allow for the traditional traffic analysis to take the precedence it has a long history of enjoying.<sup>14</sup> Additionally, they note, local politics are at play in the way LOS is deployed. This is in part because the process is based on disclosure, meaning a proposal that is going through the CEQR process does not necessarily have to present a mitigation for every single negative impact, they simply have to disclose that there is good reason to believe there would be a negative impact. So while this may mean there is a greater chance that the proposal could be rejected, it is entirely possible that any "unmitigatable impacts" that are disclosed will be overlooked, especially if there is a lot of political incentive to pass the proposal.<sup>15</sup>

In his essay *Level of Service Concepts: Development, Philosophies, and Implications*, Roger P. Roess discusses the importance of training that practitioners ought to receive in order to integrate the new modes of LOS analysis.

Given the relative complexity of newer techniques compared with the 1965 HCM, and given the rather substantial revisions in the use of and criteria for level of service, the re-education effort will be most important to a smooth transition. There are also more users to consider: Since the 1965 HCM, more and more professionals have found critical uses for the manual, including as input to environmental analyses. Courses will have to focus not only on practitioners but on the policymakers and administrators who must act on the basis of capacity analyses and related information. It is at this level that the revisions in LOS criteria must be most clearly transmitted to avoid the misuse of new analysis output based on old criteria.<sup>16</sup>

---

<sup>13</sup> Jake Offenhartz, "DOT: It's 'Psychologically Unrealistic' To Put Two-Way Bike Lane On Central Park West," *Gothamist*, June 12, 2019, sec. News,

<https://gothamist.com/news/dot-its-psychologically-unrealistic-to-put-two-way-bike-lane-on-central-park-west>.

<sup>14</sup> Mike Flynn and Jeff Smithline, Zoom interview with author, July 18, 2023.

<sup>15</sup> Ibid.

<sup>16</sup> Roess, "Level of Service Concepts," 5.

Are practitioners receiving this type of training? Are the newer multi modal standards being used at the same frequency as the more entrenched vehicular LOS? If so, is that evaluation taking place with the depth of analysis outlined in the CEQR technical manual? How is the public or even transportation officials who aren't directly involved in the CEQR process ever to know?

Luckily, there is a fair amount of room to make changes based on an honest inventory of these questions. Though LOS is the traditional metric for evaluating traffic, it is not a federal mandate. In fact the US DOT has recently published several documents making this explicit, stating that there is a “mistaken perception held by some state and local planners and engineers that USDOT requires not only the use of LOS in roadway design but also the attainment of a certain LOS score.”<sup>17</sup> In 2016, FHWA even published a memo clarifying this misunderstanding.<sup>18</sup> Additionally, in their document titled, *Evolving Use of Level of Service Metrics in Transportation Analysis*, FHWA offered case studies of several US regions that have moved away from traditional, auto-centric LOS metrics.

### The Building and Land Use Approval Streamlining Taskforce (BLAST)

New York City is in a particularly limber place around CEQR, having already recognized the need to improve the process. Due to increasing urgency around the lack of affordable housing, exacerbated by a high demand for housing coupled with a limited supply driving up prices, Mayor Eric Adams' administration is looking for ways to speed up the housing development process—typically painfully slow—especially in New York City. One of the ways he is addressing this is by forming the Building and Land Use Approval Streamlining Taskforce, or BLAST, for short. This committee, which announced its plans at the end of 2022, is co-chaired by Maria Torres-Springer, Deputy Mayor for Economic & Workforce Development; Melanie La Rocca, the Chief Efficiency Officer; and Jessica Katz, the Chief Housing Officer, with Robert Holbrook serving as Executive Director, aided by the participation of 25 city agencies and “scores of advocates, local communities, and experts,” who together, Adams states in the report's opening letter, “identified 111 ways the City's processes governing development are broken and, most importantly, how to fix them.”<sup>19</sup> The overall goal of the BLAST committee is to cut out the bureaucratic bloat within the development process, shortening the overall process by 50%, “without sacrificing environmental health, public engagement, or safety.”<sup>20</sup>

The BLAST committee looked at three processes: the City Environmental Quality Review (CEQR), the Land Use approval process, and the Department of Buildings' permitting process, which were “created to

---

<sup>17</sup> U.S. Department of Transportation, “Evolving Use of Level of Service Metrics in Transportation Analysis - Introduction,” (2017): 3, <https://www.transportation.gov/office-policy/transportation-policy/evolving-use-level-service-metrics-transportation-analysis>.

<sup>18</sup> Federal Highway Administration, “Level of Service on the National Highway System,” May 6, 2016, <https://www.fhwa.dot.gov/design/standards/160506.cfm>.

<sup>19</sup> “Get Stuff Built: A Report on the Building and Land Use Approval Streamlining Taskforce” (NYC Department of Planning, December 8, 2022), 3, <https://www.nyc.gov/assets/home/downloads/pdf/press-releases/2022/GetStuffBuilt.pdf>.

<sup>20</sup> Ibid.

safeguard the environment, ensure public participation, and protect public safety, respectively.”<sup>21</sup> However, these processes, the report states, “have become unnecessarily complicated, costly, and time-consuming—delaying critical projects like affordable housing” with the associated costs being “passed down to New Yorkers in the form of higher rents, fewer units of affordable housing, and reduced job opportunities.”<sup>22</sup> This is especially concerning given that it is the city’s environmental review process that is contributing to the red tape and expense of building housing that makes sprawl development more appealing.<sup>23</sup>

One important recommendation that came out of the BLAST report is to eliminate parking considerations from the traffic analysis portion of CEQR. A report *Open Plans* published in March 2023 detailing the effects of parking minimums on housing supply indicates that, from a cost perspective, for every 1.2 parking spaces created, 1 unit of housing is lost (not to mention a host of other negative impacts). But BLAST cites reevaluating the traffic analysis portion of CEQR as the most important revision, stating, “The City will replace the existing methodology of vehicle delay based traffic analysis at a lane group scale in the transportation analysis of CEQR.”<sup>24</sup> However, while the BLAST report lists 20 improvements to the CEQR process, the language lacks specificity. For instance, there are two recommendations concerning traffic analysis and Level of Service. The first of which is to “restructure detailed traffic and mobile source air quality/noise analysis.” Yet the description merely reiterates what the CEQR technical manual already aims to do: “A new methodology would assess a project’s potential for significant adverse impacts based on a proposed project’s transportation demands, location, the surrounding conditions in the transportation system and the City’s established transportation policy.”<sup>25</sup> The other traffic analysis related recommendation is to “adjust thresholds for detailed transportation analysis and impact criteria.” However, again, the description offered merely states that DOT, the agency responsible for the change, will, “Revisit the minimum thresholds for detailed analyses as well as the impact criteria. Review opportunities to modify thresholds.”<sup>26</sup>

#### Harms and Consequences of traditional LOS:

All in all, environmental review processes are typically inefficient mechanisms to advocate for environmental standards. Not least because they don’t actually set standards. Rather they are meant to assess how much negative impact a given proposal is likely to have. As traffic engineer Jeff Smithline noted, processes like CEQR, NEPA and others that are framed around disclosure and mitigation, are reactive ways of advocating for environmental quality.<sup>27</sup> Angie Schmitt, writing for *Streetsblog*, noted an illustrative example of how this conflict might play out when trying to get a bike or bus lane built in San Francisco, “the city first had to show —

---

<sup>21</sup> Ibid, 7.

<sup>22</sup> Ibid.

<sup>23</sup> Ibid, 10, 11.

<sup>24</sup> Ibid, 17.

<sup>25</sup> Ibid, 30.

<sup>26</sup> Ibid, 33.

<sup>27</sup> Mike Flynn and Jeff Smithline, Zoom interview with author, July 18, 2023.

as part of environmental law — that drivers would not be inconvenienced.”<sup>28</sup> Another Streetsblog article published in 2019 reporting on California’s move away from traditional LOS notes that though it may mean good business for lawyers, “The California Environmental Quality Act is far from perfect, and in fact is quite a clunky way to protect the environment.”<sup>29</sup> One reason being that it requires litigation, or the threat of litigation, as its primary enforcement mechanism, which results in significant delays and costs while bureaucratic processes are interpreted and enforced through the courts.<sup>30</sup>

Aside from the inefficiency and ineffectiveness of LOS standards, including New York’s current attempt at a Multi Modal LOS metric, there are additional harms associated. It can be helpful to imagine these factors mapped out on a spectrum spanning micro, meso, and macro scales.

The micro scale might include the design of individual streets, intersections, and sidewalks. LOS shows up at this scale when, for example, street widening and sidewalk shortening are proposed as mitigations for land use proposals that forecast increased car travel.

The meso scale includes impacts at the level of public transit corridors and highways, not quite the level of entire transportation systems, but key networks that make up the system. At this scale, the negative effects LOS can have are fairly similar to the example listed above, but where the stakes are slightly amplified. Patrick Sisson, writing for the City Monitor, notes how bus routes can face trouble under LOS, “it often provides a rationale to cancel routes that rate poorly even if they serve other goals: an imperfect bus route can still contribute to a more robust transit network and address equity, sustainability or land use needs.”<sup>31</sup>

The majority and the most worrisome effects take place at the macro scale. These impacts include: public transportation systems, infrastructure costs of maintaining roadways, urban sprawl, carbon emissions, automobile deaths, pedestrian and cyclist injuries and deaths, the lack of available play space for children, parking space that could otherwise be devoted to housing, parks or any number of social benefits,<sup>32,33</sup> the country’s highest asthma rates,<sup>34</sup> heart disease (the leading cause of death for adults in the U.S.<sup>35</sup>) in part due to a

---

<sup>28</sup> Angie Schmitt, “The Beginning of the End for Level of Service?,” *Streetsblog USA*, October 3, 2013, <https://usa.streetsblog.org/2013/10/03/the-beginning-of-the-end-for-level-of-service>.

<sup>29</sup> Melanie Curry, “At Last, New Rules Are Final: Car Delay Is (Sometimes) NOT an Environmental Impact,” *Streetsblog California*, January 4, 2019, <https://cal.streetsblog.org/2019/01/04/at-last-new-rules-are-final-car-delay-is-sometimes-not-an-environmental-impact>.

<sup>30</sup> Ibid.

<sup>31</sup> Patrick Sisson, “Is It Time for Transportation Planners to Move beyond ‘level of Service?,” *City Monitor*, March 3, 2023, <https://citymonitor.ai/transport/its-time-for-transportation-planners-to-move-beyond-level-of-service>.

<sup>32</sup> Brad Aaron, “How Else Could NYC Use Its 12 Central Parks Worth Of Street Parking Space?,” *Gothamist*, September 24, 2019, <https://gothamist.com/news/how-else-could-nyc-use-its-12-central-parks-worth-street-parking-space>.

<sup>33</sup> Transportation Alternatives, “NYC 25X25: A Challenge to New York City’s Leaders to Give Streets Back to People,” 2021, <https://nyc25x25.org/25x25report>.

<sup>34</sup> “Asthma,” Columbia University Mailman School of Public Health, January 29, 2020, <https://www.publichealth.columbia.edu/research/centers/columbia-center-childrens-environmental-health/our-research/health-effects/asthma>.

<sup>35</sup> “Heart Disease Facts,” Centers for Disease Control and Prevention, May 15, 2023, <https://www.cdc.gov/heartdisease/facts.htm>.

transportation system that incentivizes car travel and disincentivizes walking, cycling.<sup>363738</sup> Additionally, these harms are experienced disproportionately by the poor and people of color.<sup>39404142</sup>

At the macro level there are also the effects that aren't experienced immediately but may be projected into the future. Miriam Pinski writes about the need for planners to think tandemly about these timelines, "The city also has to quantify the impacts that a driving trip today has in the future. Time horizons matter. Calculating social costs and benefits can't just include the immediate impacts, but the discounted future costs and benefits as well. Polluted air today might mean premature births half a year later, and lower test scores for those children a decade after that. Our understanding of what those current and future impacts are change the more we learn about them."<sup>43</sup>

One particular macro level effect that is worth spending some time on—in part because it is an oft cited effect—is the role LOS plays on development sprawl further and further from cities. Sometimes referred to as greenfield development, urban sprawl presents a concerning environmental impact because of the attendant

---

<sup>36</sup> Melanie Curry, "California Prepares to Shift Planning Focus from Car Delay to Induced Travel," *Streetsblog California*, April 17, 2020,

<https://cal.streetsblog.org/2020/04/17/california-prepares-to-shift-planning-focus-from-car-delay-to-induced-travel>.

<sup>37</sup> Richard Patterson et al., "Associations of Public Transportation Use With Cardiometabolic Health: A Systematic Review and Meta-Analysis," *American Journal of Epidemiology* 188, no. 4 (January 25, 2019): 785–95, <https://doi.org/10.1093/aje/kwz012>.

<sup>38</sup> Matthew Bigg, "Car-Driven Society Poses Health Risk for Americans," *Reuters*, May 28, 2009, <https://www.reuters.com/article/us-healthcare-driving/car-driven-society-poses-health-risk-for-americans-idUSTRE54S00220090529>.

<sup>39</sup> "Motor Vehicle Fatality Disparities by Race or Ethnic Origin - Injury Facts," NSC Injury Facts, accessed July 20, 2023, <https://injuryfacts.nsc.org/motor-vehicle/road-users/disparities-by-race-or-ethnic-origin/#>.

<sup>40</sup> Matthew A. Raifman and Ernani F. Choma, "Disparities in Activity and Traffic Fatalities by Race/Ethnicity - American Journal of Preventive Medicine" 63, no. 2 (June 7, 2022): 160–67, [https://www.ajpmonline.org/article/S0749-3797\(22\)00155-6/fulltext](https://www.ajpmonline.org/article/S0749-3797(22)00155-6/fulltext).

<sup>41</sup> "Asthma."

<sup>42</sup> "Premature Heart Disease and Stroke Deaths Among Adults in New York City," NYC Department of Health, November 2017, <https://www.nyc.gov/assets/doh/downloads/pdf/epi/databrief95.pdf>.

<sup>43</sup> Miriam Pinski, "How Copenhagen Measures the Costs of Driving — And Crafts Policy to Reduce Them," *Streetsblog USA*, June 13, 2023, <https://usa.streetsblog.org/2023/06/13/how-copenhagen-measures-the-costs-of-driving-and-crafts-policy-to-reduce-it>.



greenhouse emissions of living outside dense urban centers, which a recent Brookings Institute has put at four

times as great as households in urban

areas.<sup>4445464748</sup>

Image credit:

<https://coolclimate.berkeley.edu/maps>

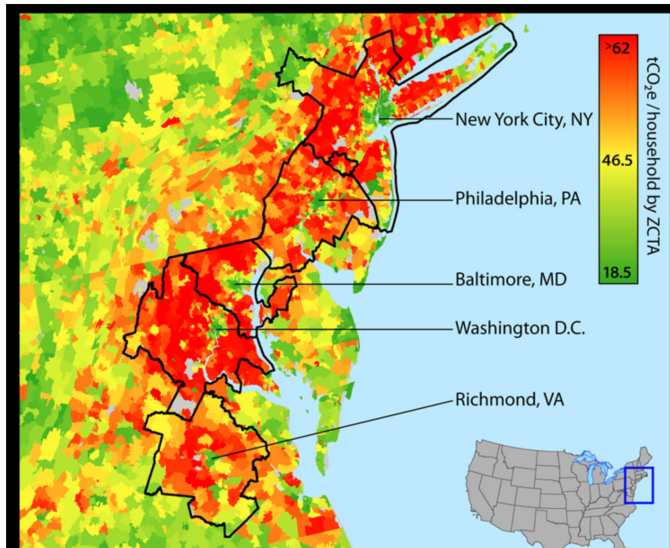
Describing the layered and circular, catch-22 quality of the LOS approach to congestion, Melanie Curry writes, “It encouraged development outside of city cores, putting housing, jobs, and shopping farther from each other and harder to get to without a car. By prioritizing car speeds, it encouraged more driving, which ended up creating more congestion and adding to pressures to develop farther and farther away from city centers.”<sup>49</sup>

But describing it as a catch-22 disregards the avenues we could take to change this system of prioritization, and the many places that are in fact already exploring these avenues.

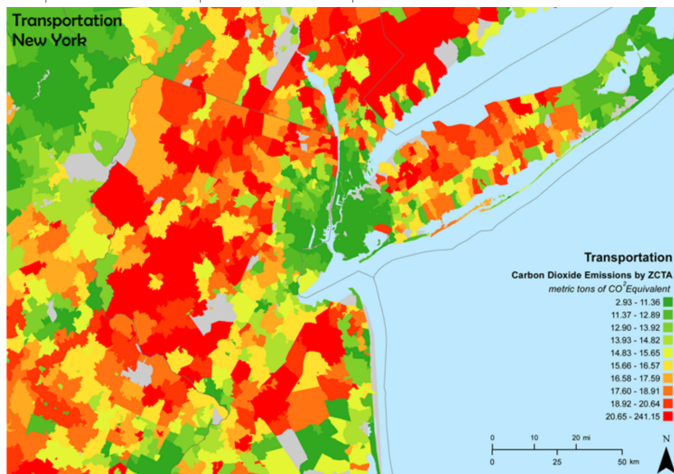
Place precedents that are changing LOS:

One, somewhat unexpected instance of LOS experimentation can be found in Florida.

Average Household Carbon Footprint - Eastern United States



Transportation Carbon Footprint - New York Metropolitan Area



<sup>44</sup> Robert Sanders, “Suburban Sprawl Cancels Carbon-Footprint Savings of Dense Urban Cores | Berkeley News,” *Berkeley News*, January 6, 2014,

<https://news.berkeley.edu/2014/01/06/suburban-sprawl-cancels-carbon-footprint-savings-of-dense-urban-cores/>.

<sup>45</sup> Megumi Tamura and Joseph W. Kane, “It’s Not Just Cities—Suburbs and Exurbs Need to Adopt and Implement Climate Plans Too,” *Brookings*, April 26, 2023,

<https://www.brookings.edu/articles/its-not-just-cities-suburbs-and-exurbs-need-to-adopt-and-implement-climate-plans-to-o/>.

<sup>46</sup> Sabrina Zwick, “Suburban Living the Worst for Carbon Emissions – New Research,” *The Conversation*, July 5, 2021, <http://theconversation.com/suburban-living-the-worst-for-carbon-emissions-new-research-149332>.

<sup>47</sup> Stephen Hudson, “This Map Shows How Low-Density Sprawl Makes Climate Change Worse,” *Greater Greater Washington*, May 2, 2022,

<https://gwwash.org/view/84816/this-map-shows-how-low-density-sprawl-makes-climate-change-worse>.

<sup>48</sup> Edward L Glaeser and Matthew E. Kahn, “The Greenness of Cities: Carbon Dioxide Emissions and Urban Development” (Harvard Kennedy School, July 2008),

[https://www.hks.harvard.edu/sites/default/files/centers/taubman/files/glaeser\\_08\\_greencities.pdf](https://www.hks.harvard.edu/sites/default/files/centers/taubman/files/glaeser_08_greencities.pdf).

<sup>49</sup> Curry, “California Prepares to Shift Planning Focus from Car Delay to Induced Travel.”

Disturbed by its superlative status as leader in pedestrian deaths by motor vehicles, Florida has adopted a multi modal level of service to remedy the car centrism that produced the dangerous dynamics on its streets.<sup>50</sup><sup>51</sup> In the process, Florida has made fast improvements to its street safety and has established itself as a leader in multi modal LOS research.<sup>52</sup> Acknowledging the limitations of MMLOS standards that analyze each transportation mode separately, the Federal DOT notes in its *Evolving Use of Level of Service Metrics in Transportation - Florida Cases Study*, “FDOT is exploring more comprehensive Complete Streets performance measures that may be able to assist in evaluating the tradeoffs between modes.”<sup>53</sup>

Minnesota’s Metropolitan Council (MN Met Council) had a different motivating force. After a bridge collapsed in 2007, killing 13 people and injuring many more, there was pressure to increase investment in the transportation infrastructure. However, even with the passage of a bill increasing funding for improvements, the MN Met Council found it simply couldn’t afford to carry out the transportation infrastructure plans that centered on increasing capacity. This led the MN Met Council to shift gears. A case study report published by the federal Department of Transportation explains how, “Where evaluations had previously relied on Level of Service (LOS) and volume-to-capacity (v/c) ratios as metrics, Met Council began to introduce travel time reliability and people-moving capacity as supplemental analyses.”<sup>54</sup>

Charlotte, North Carolina uses a multi modal LOS standard. And just this year Washington state passed HB 1181, which, among other changes, added “multi modal” to all mentions of “Level of Service” in its Growth Management Act.<sup>55</sup><sup>56</sup> These are just a sampling of the cities and states making changes to the way they conceive of LOS and land use more broadly.

Due to the statewide mandate brought about by SB 743, which passed in 2013, one of the more prominent examples of LOS reform is California’s switch from traditional LOS to a Vehicle Miles Traveled (VMT) metric. As Melanie Curry wrote in a 2018 Streetsblog article on California’s CEQA changes, “This shift acknowledges that it is the amount of travel, not delay or congestion, that is the real environmental problem.”<sup>57</sup>

---

<sup>50</sup> “Dangerous by Design 2014,” Smart Growth America, 2014, <https://smartgrowthamerica.org/resources/dangerous-by-design-2014/>.

<sup>51</sup> U.S. Department of Transportation, “Evolving Use of Level of Service Metrics in Transportation Analysis – Florida Case Study,” January 19, 2017.

<sup>52</sup> Ibid.

<sup>53</sup> Ibid, 5.

<sup>54</sup> U.S. Department of Transportation, “Evolving Use of Level of Service Metrics in Transportation Analysis - Metropolitan Council Case Study,” January 19, 2017, 1, [https://www.transportation.gov/sites/dot.gov/files/docs/LOS%20Case%20Study%20Met%20Council\\_508.pdf](https://www.transportation.gov/sites/dot.gov/files/docs/LOS%20Case%20Study%20Met%20Council_508.pdf).

<sup>55</sup> Schmitt, “The Beginning of the End.”

<sup>56</sup> Tom Fucoloro, “Under New Law, Washington Communities Must Plan around ‘Multimodal Level of Service,’” *Seattle Bike Blog* (blog), May 3, 2023, <https://www.seattlebikeblog.com/2023/05/03/under-new-law-washington-communities-must-plan-around-multimodal-level-of-service/>.

<sup>57</sup> Melanie Curry, “Mitigation Banks: How Benefits from Upcoming CEQA Change Could Be Captured, Shared, Amplified,” *Streetsblog California*, October 5, 2018,

In a 2014 article, Streetsblog writer Damien Newman summarized the move as follows, “In short, instead of measuring whether or not a project makes it less convenient to drive, it will now measure whether or not a project contributes to other state goals, like reducing greenhouse gas emissions, developing multimodal transportation, preserving open spaces, and promoting diverse land uses and infill development.”<sup>58</sup> Additionally, the changes California has made to its environmental review process will allow for more opportunities to bypass the CEQA process (California’s version of CEQR) altogether if those proposals are “shown to decrease vehicle miles traveled — for example, bike lanes or pedestrian paths, or a grocery store that allows local residents to travel shorter distances to shop.”<sup>59</sup> While transferring from an LOS standard to a VMT based system will require training and an implementation process, California’s Office of Planning and Research noted that, overall, the VMT system—the metric transition brought about by the passage of SB 743 in 2013— is a less complicated metric than traditional LOS.<sup>60</sup> Newman echoes this sentiment, noting the added benefit that VMT calculations are easier and faster to determine than traditional LOS traffic analyses.<sup>61</sup>

That being said, while acknowledging its effectiveness and efficiency as an environmental quality standard, VMT has its limitations. The U.S. Department of Transportation’s California case study analysis notes how, “While VMT measures impact of, and on, the transportation system (e.g., emissions, energy consumption, demand on infrastructure, and health, etc.), they do not measure how well the transportation system provides access to destinations. Beyond environmental analyses required for CEQA, additional analyses are needed to better understand and address the operations of the transportation system. Having long recognized many of the challenges and limitations associated with LOS analysis, and as part of preparing for SB 743 implementation, Caltrans has begun to explore alternate methods for measuring multimodal mobility.”<sup>62</sup>

### Tiered interventions

With these precedents in mind, here are a few interventions that New York City could take to improve its current LOS framework.

#### Tier 1: easiest implementation

As part of their long range transit plan called the *2040 Vision Plan*, the Houston district of Texas’s DOT has re-evaluated its use of LOS, scrapping the term ‘LOS’ altogether. This new framework outlines a minimum quality standard for each transportation mode, with the added

---

<https://cal.streetsblog.org/2018/10/05/mitigation-banks-how-benefits-from-upcoming-ceqa-change-could-be-captured-shared-amplified>.

<sup>58</sup> Damien Newton, “California Has Officially Ditched Car-Centric ‘Level of Service,’” *Streetsblog Los Angeles*, August 7, 2014, <https://la.streetsblog.org/2014/08/07/california-has-officially-ditched-car-centric-level-of-service>.

<sup>59</sup> Ibid.

<sup>60</sup> U.S. Department of Transportation, “Evolving Use of Level of Service Metrics in Transportation Analysis - California Case Study,” January 19, 2017, 4.

<sup>61</sup> Newton, “California Has Officially.”

<sup>62</sup> U.S. Department of Transportation, “Evolving,” 6.

requirement of meeting the pedestrian, cyclist, and transit standards *before* considering the ways a proposal may affect vehicular traffic. Adopting a framework similar to the one used in Houston might help NYC integrate its multi-modal metrics into CEQR in a more meaningful way, particularly if the pedestrian, cycling, and public transit metrics are given preference as they are in Houston’s system.

Houston’s DOT is still in the process of developing their new standard, and has an *Infrastructure Design Manual* forthcoming, which can offer guidance to NYC DOT as they continue to re-evaluate the transportation section of CEQR.

### Tier 2: Longer term

On one hand adopting a Vehicle Miles Traveled standard would be a major overhaul of NYC’s LOS practice. It would likely require a fair amount of political support and legislative action, as it did in California. However, it would more effectively meet the streamlining goals Mayor Eric Adams is after in the BLAST. This is in part because of the relative ease and speed of calculating VMT when compared with the arduous LOS metric.<sup>63</sup>

While VMT has its limitations, noted above, as a system it does a much better job of integrating environmental, land use, and transportation goals. Patrick Sisson describes this integration using an example of a theoretical proposal for a residential development, “Say you’re analysing the impact of a housing development. If decisions about the roadways are evaluated using LOS, they will tend to favour large, sprawling, suburban-style planning with wide roads – an attempt to disperse traffic and keep the flow steady. But if decisions are made with an eye on reducing total vehicle miles travelled – a tally of ground covered by all cars and trucks – they’ll likely favour a dense, multimodal, multi-use, walkable-street layout because proximity to stores and services cuts down on car trips.”<sup>64</sup>

### Tier 3: The Need for Holistic Planning

Any changes to the current environmental review metrics that the city adopts will likely work best when nested within a more holistic land use planning framework. In their *Urban Street Design Guide* published by Island Press, The National Association of City Transportation Officials (NACTO) echo this sentiment, recommending that street and transit performance measures, “take a multi-disciplinary approach, looking at urban streets and traffic at the macro and the micro scale, through the lens of safety, economy, and design, and inclusive of the goals and behaviors of everyone using the street.”<sup>65</sup>

---

<sup>63</sup> Newton, “California Has Officially.”

<sup>64</sup> Sisson, “Is It Time for Transportation.”

<sup>65</sup> National Association of City Transportation Officials, *Urban Street Design Guide* (Washington DC: Island Press, 2013), 155.

With the leadership of then-Council Member Brad Lander, the New York City Council produced a report in 2019 making recommendations to the New York City Charter Revision Commission. One of the recommendations in that report was to require the city council pass a comprehensive plan every 10 years.<sup>66</sup>

As the *Gotham Gazette* reported, the city of New York is the only major U.S. city that doesn't have a comprehensive plan. When speaking to this, the General Counsel and Chief Data Officer at the Department of City Planning, Anita Laremont said, "This is such a dynamic city, in terms of where people live, where they work, we actually believe that it would not be productive to try to sit down and come up with a plan, because that dynamism really leads to a need to be responsive and nimble."<sup>67</sup>

But "nimble" is hardly the word that comes to mind when thinking of CEQR or other land use processes that are supposed to be able to account for local contexts around land use proposals. Instead, the lack of a comprehensive plan has often produced many complicated, overlapping and sometimes contradictory processes. The types that lead to a long line of Mayors creating various task forces to re-evaluate and attempt to streamline bureaucratic processes. But bureaucratic processes are often created *because* there isn't coordination between agencies, initiatives, and resolutions. Hence—returning to the Central Park West bike lane case study—you get scenarios where DOT is actively working against its own Vision Zero Initiative, in part due to the transportation policy in a different land use process employing the outdated LOS process that stalls forward movement on that initiative.

Ultimately the Commission decided against even bringing the topic of comprehensive planning to a vote, missing an opportunity to move towards holistic planning, but one that can hopefully be built upon in subsequent efforts.<sup>68</sup>

There is, however, the option of starting from a more imaginative, ambitious place, and asking, what can we do to improve air quality, clean waterways, or any number of other indicators, rather than what can we do to reduce the impacts of congestion (though, again, traditional LOS isn't even effectively do that much). The NACTO *Urban Street Design Guide* describes this need to think beyond defensive, risk-based environmental review processes, "Cities should strive to integrate varied and holistic performance measures into their development review process, including measures that frame potential benefits, as well as those that capture risk."<sup>69</sup>

---

<sup>66</sup> Corey Johnson, Fernando Cabrera, and Brad Lander, "NYC Council Report to the 2019 Charter Revision Commission," January 2019, <https://council.nyc.gov/wp-content/uploads/2019/02/NYC-Council-Report-to-the-2019-Charter-Revision-Commission.pdf>.

<sup>67</sup> Gabriel Slaughter and Ben Max, "New York City Doesn't Have a Comprehensive Plan; Does It Need One?," *Gotham Gazette*, May 16, 2018, <https://www.gothamgazette.com/city/7674-new-york-city-doesn-t-have-a-comprehensive-plan-does-it-need-one>.

<sup>68</sup> Rebecca C. Lewis, "What NYC Charter Amendments Didn't Make It on the Ballot?," *City & State NY*, July 31, 2019, <https://www.cityandstateny.com/politics/2019/07/what-nyc-charter-amendments-didnt-make-it-on-the-ballot/177082/>.

<sup>69</sup> National Association of City Transportation Officials, *Urban Street Design Guide*, 158.

Writing about the insights offered by Jeffrey Tumlin, a consultant at NelsonNygaard, Angie Schmitt notes how “searching for a direct replacement for Level of Service is the wrong way to go, because part of the problem with Level of Service is the narrowness of its scope.”<sup>70</sup> Instead, Tumlin posits, a better place to start is by asking, “What are all of the things we want our transportation system to do, and how do we measure whether it’s doing that or not?”<sup>71</sup> Ultimately, this approach is one that starts by revisioning—and most importantly, because we’ve seen how traditional LOS hasn’t managed to do this—integrating our social and environmental values and priorities within a framework that sees those priorities as co-constitutive rather than discrete parts.

Amidst the urgency New York City is facing around housing affordability, public health and safety, transportation infrastructure, and meeting its environmental goals, Level of Service emerges as an area of city planning that carries surprising influence. While making comprehensive changes ought to be the long term goal, in the interim NYC could incorporate into its CEQR process a minimum standard for the transportation modes that support the City’s carbon emission goals or going a step further and electing to replace its LOS standard with a VMT metric. What’s clear is that it’s time for New York’s land use process to take more proactive and aggressive steps to achieve climate and safety goals, and meet the diversity of needs of New York City residents.

## References

---

<sup>70</sup> “Beyond ‘Level of Service’ -- New Methods for Evaluating Streets — Streetsblog USA.”

<sup>71</sup> Ibid.

Aaron, Brad. "How Else Could NYC Use Its 12 Central Parks Worth Of Street Parking Space?" *Gothamist*, September 24, 2019.

<https://gothamist.com/news/how-else-could-nyc-use-its-12-central-parks-worth-street-parking-space>.

"Asthma." Columbia University Mailman School of Public Health. January 29, 2020.

<https://www.publichealth.columbia.edu/research/centers/columbia-center-childrens-environmental-health/our-research/health-effects/asthma>.

"Beyond 'Level of Service' — New Methods for Evaluating Streets" October 23, 2013.

<https://usa.streetsblog.org/2013/10/23/the-problem-with-multi-modal-level-of-service>.

Bigg, Matthew. "Car-Driven Society Poses Health Risk for Americans." *Reuters*, May 28, 2009.

<https://www.reuters.com/article/us-healthcare-driving/car-driven-society-poses-health-risk-for-americans-idUSTRE54S00220090529>.

Curry, Melanie. "The Next Step in Getting Rid of Level of Service: Coming Soon." *Streetsblog California*.

October 9, 2015.

<https://cal.streetsblog.org/2015/10/09/the-next-step-in-getting-rid-of-level-of-service-coming-soon>.

"Mitigation Banks: How Benefits from Upcoming CEQA Change Could Be Captured, Shared, Amplified." *Streetsblog California*, October 5, 2018.

<https://cal.streetsblog.org/2018/10/05/mitigation-banks-how-benefits-from-upcoming-ceqa-change-could-be-captured-shared-amplified>.

"At Last, New Rules Are Final: Car Delay Is (Sometimes) NOT an Environmental Impact." *Streetsblog California*, January 4, 2019.

<https://cal.streetsblog.org/2019/01/04/at-last-new-rules-are-final-car-delay-is-sometimes-not-an-environmental-impact>.

"California Prepares to Shift Planning Focus from Car Delay to Induced Travel." *Streetsblog California*, April 17, 2020.

<https://cal.streetsblog.org/2020/04/17/california-prepares-to-shift-planning-focus-from-car-delay-to-induced-travel>.

“Dangerous by Design 2014.” Smart Growth America. 2014.

<https://smartgrowthamerica.org/resources/dangerous-by-design-2014/>.

“Environmental Review Process - DCP.” n.d. Environmental Review Process. Accessed July 6, 2023.

<https://www.nyc.gov/site/planning/applicants/environmental-review-process.page>.

Federal Highway Administration. “Level of Service on the National Highway System.” May 6, 2016.

<https://www.fhwa.dot.gov/design/standards/160506.cfm>.

Fink, Camille. “Level of Service, the Wrong Performance Measure.” Planetizen. March 29, 2019.

<https://www.planetizen.com/news/2019/03/103599-level-service-wrong-performance-measure>.

Fucoloro, Tom. “Under New Law, Washington Communities Must Plan around ‘Multimodal Level of Service.’” *Seattle Bike Blog* (blog). May 3, 2023.

<https://www.seattlebikeblog.com/2023/05/03/under-new-law-washington-communities-must-plan-around-multimodal-level-of-service/>.

“Get Stuff Built: A Report on the Building and Land Use Approval Streamlining Taskforce.” 2022. NYC Department of Planning.

<https://www.nyc.gov/assets/home/downloads/pdf/press-releases/2022/GetStuffBuilt.pdf>.

Glaeser, Edward L, and Matthew E. Kahn. 2008. “The Greenness of Cities: Carbon Dioxide Emissions and Urban Development.” Harvard Kennedy School.

“Heart Disease Facts.” Centers for Disease Control and Prevention. May 15, 2023.

<https://www.cdc.gov/heartdisease/facts.htm>.

Hudson, Stephen. “This Map Shows How Low-Density Sprawl Makes Climate Change Worse.” *Greater Greater Washington*, May 2, 2022.

<https://ggwash.org/view/84816/this-map-shows-how-low-density-sprawl-makes-climate-change-worse>.



Johnson, Corey, Fernando Cabrera, and Brad Lander. “NYC Council Report to the 2019 Charter Revision Commission.”  
<https://council.nyc.gov/wp-content/uploads/2019/02/NYC-Council-Report-to-the-2019-Charter-Revision-Commission.pdf>.

Lewis, Rebecca C. “What NYC Charter Amendments Didn’t Make It on the Ballot?” *City & State NY*, July 31, 2019.  
<https://www.cityandstateny.com/politics/2019/07/what-nyc-charter-amendments-didnt-make-it-on-the-ballot/177082/>.

“Motor Vehicle Fatality Disparities by Race or Ethnic Origin - Injury Facts.” n.d. NSC Injury Facts. Accessed July 20, 2023.  
<https://injuryfacts.nsc.org/motor-vehicle/road-users/disparities-by-race-or-ethnic-origin/#>.

National Association of City Transportation Officials. 2013. *Urban Street Design Guide*. Washington DC: Island Press.  
<https://nacto.org/publication/urban-street-design-guide/design-controls/performance-measures/>.

Newton, Damien. “California Has Officially Ditched Car-Centric ‘Level of Service.’” *Streetsblog Los Angeles*, August 7, 2014.  
<https://la.streetsblog.org/2014/08/07/california-has-officially-ditched-car-centric-level-of-service>.

Offenhardt, Jake. “DOT: It’s ‘Psychologically Unrealistic’ To Put Two-Way Bike Lane On Central Park West.” *Gothamist*, June 12, 2019, sec. News.  
<https://gothamist.com/news/dot-its-psychologically-unrealistic-to-put-two-way-bike-lane-on-central-park-west>.

Patterson, Richard, Elizabeth Webb, Thomas Hone, Christopher Millett, and Anthony A Lavery. 2019. “Associations of Public Transportation Use With Cardiometabolic Health: A Systematic Review and Meta-Analysis.” *American Journal of Epidemiology* 188 (4): 785–95.  
<https://doi.org/10.1093/aje/kwz012>.

Pinski, Miriam. “How Copenhagen Measures the Costs of Driving — And Crafts Policy to Reduce Them.” *Streetsblog USA*, June 13, 2023.

<https://usa.streetsblog.org/2023/06/13/how-copenhagen-measures-the-costs-of-driving-and-crafts-policy-to-reduce-it>.

“Premature Heart Disease and Stroke Deaths Among Adults in New York City.” NYC Department of Health. November 2017. <https://www.nyc.gov/assets/doh/downloads/pdf/epi/databrief95.pdf>.

Raifman, Matthew A., and Ernani F. Choma. 2022. “Disparities in Activity and Traffic Fatalities by Race/Ethnicity - American Journal of Preventive Medicine” 63 (2): 160–67.

Roess, Roger. 1984. “Level of Service Concepts: Development, Philosophies, and Implications.” *Transportation Research Board*, no. 971: 1–6.

Sanders, Robert. “Suburban Sprawl Cancels Carbon-Footprint Savings of Dense Urban Cores | Berkeley News.” *Berkeley News*, January 6, 2014.  
<https://news.berkeley.edu/2014/01/06/suburban-sprawl-cancels-carbon-footprint-savings-of-dense-urban-cores/>.

Schmitt, Angie. “The Beginning of the End for Level of Service?” *Streetsblog USA*, October 3, 2013.  
<https://usa.streetsblog.org/2013/10/03/the-beginning-of-the-end-for-level-of-service>.

Semel, Hilary, Esther Brunner, Denise Pisani, Ingrid Young, Susan Amron, Robert Dobruskin, Olga Abinader, et al. 2021. “City Environmental Review Process Technical Manual.”

Sisson, Patrick. “Is It Time for Transportation Planners to Move beyond 'level of Service?’” *City Monitor*, March 3, 2023.  
<https://citymonitor.ai/transport/its-time-for-transportation-planners-to-move-beyond-level-of-service>.

Slaughter, Gabriel, and Ben Max. “New York City Doesn’t Have a Comprehensive Plan; Does It Need One?” *Gotham Gazette*, May 16, 2018.  
<https://www.gothamgazette.com/city/7674-new-york-city-doesn-t-have-a-comprehensive-plan-does-it-need-one>.

Tamura, Megumi, and Joseph W. Kane. 2023. “It’s Not Just Cities—Suburbs and Exurbs Need to Adopt and Implement Climate Plans Too.” *Brookings*, April 26, 2023.

<https://www.brookings.edu/articles/its-not-just-cities-suburbs-and-exurbs-need-to-adopt-and-imple-ment-climate-plans-too/>.

Transportation Alternatives. 2021. "NYC 25X25: A Challenge to New York City's Leaders to Give Streets Back to People." <https://nyc25x25.org/25x25report>.

*Transportation\_2021.Pdf*. n.d. Accessed July 24, 2023.

[https://www.nyc.gov/assets/oec/technical-manual/16\\_Transportation\\_2021.pdf](https://www.nyc.gov/assets/oec/technical-manual/16_Transportation_2021.pdf).

U.S. Department of Transportation. 2017a. "Evolving Use of Level of Service Metrics in Transportation Analysis - California Case Study."

———. 2017b. "Evolving Use of Level of Service Metrics in Transportation Analysis – Florida Case Study."

———. 2017c. "Evolving Use of Level of Service Metrics in Transportation Analysis - Metropolitan Council Case Study."

[https://www.transportation.gov/sites/dot.gov/files/docs/LOS%20Case%20Study%20Met%20Council\\_508.pdf](https://www.transportation.gov/sites/dot.gov/files/docs/LOS%20Case%20Study%20Met%20Council_508.pdf).

———. 2017d. "Evolving Use of Level of Service Metrics in Transportation Analysis - Introduction," November.

<https://www.transportation.gov/office-policy/transportation-policy/evolving-use-level-service-metrics-transportation-analysis>.

U.S. Department of Transportation Federal Highway Administration. 2009. "Manual on Uniform Traffic Control Devices." <https://mutcd.fhwa.dot.gov/pdfs/2009r1r2r3/r1r2r3covintrotoc.pdf>.

"What Is LOS?" n.d. Planetizen. Accessed June 16, 2023.

<https://www.planetizen.com/definition/level-service>.

Zwick, Sabrina. 2021. "Suburban Living the Worst for Carbon Emissions – New Research." *The Conversation*, July 5, 2021.

<http://theconversation.com/suburban-living-the-worst-for-carbon-emissions-new-research-149332>.

