Guidance for Comprehensive Transportation Review in the District of Columbia:
A Parking, Design, and TDM-Focused Alternative to the Traditional Traffic Impact
Study in an Urban Setting

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Abstract: Traffic studies have been the tool of choice for engineers and planners attempting to weigh traffic impacts resulting from new development. However, they have disproportionately focused on automobile impacts. This auto-centric approach does not fit urban settings or places that take a multimodal perspective. This mismatch has long been recognized, but a compelling alternative has not yet coalesced. In the District of Columbia, a planning team at the District Department of Transportation (DDOT) set out to establish a new, more comprehensive, guide for measuring and addressing multimodal transportation impacts from development, as well as better aligning development review goals with other agency and City policy objectives aside from reduced traffic congestion. The process to establish and then mature the guidance outlined in this paper, as well as the factors and variables included in this new model for review, represent a significant leap forward in understanding the transportation impacts resulting from new development. Included in this guidance are new approaches for evaluating the appropriateness of proposed off-street parking supply and the link to induced demand for driving with more consistent mitigation guidelines to allow greater leverage of traffic impacts to realize non-automotive network improvements. This guidance can serve as a template for transportation agencies throughout North America, particularly in cities with high quality transit access.

Acknowledgements: The Authors would like to the thank the following planners, engineers, and researchers who contributed to DDOT’s trip generation and parking demand research and accompanying tools (TripsDC, Park Right DC, District Mobility) that informed the policies in the 2021 CTR Guidelines, as well as those who contributed to the development of the new approach to transportation impact analysis during the development review process:

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Without their hard work and expertise, DDOT would not have been able to innovate in these areas or have delivered the Guidance for Comprehensive Transportation Review, Version 2.0, or Version 1.0 that earned the 2019 Washington DC Section of the Institute of Transportation Engineers (WDCSITE), Project of the Year Award.
1.0 Introduction
The District of Columbia Department of Transportation (DDOT) released the Guidance for Comprehensive Transportation Review (hereafter referred to as the “CTR Guidelines”) Version 1.0 in June 2019 and will be releasing the Version 2.0 update in 2021. The CTR Guidelines provide direction to developer teams as to DDOT’s expectations for site design, parking supply, TDM programming, public space design, and multimodal transportation analyses when evaluating new development projects.
Inceptive Guidelines were established in 2012 as a first attempt at comprehensive multimodal transportation review and represented a major turning point in the shift away from auto-oriented development evaluation. The new 2021 Version 2.0 release reflects the growth in understanding resulting from years of putting this guidance into practice and a maturation of the approach to a place where it can serve as an example for others.

There were five (5) major innovations in the CTR Guidelines that this paper highlights: 1) repurposing the Level of Service (LOS) analysis to leverage non-automotive network improvements in-lieu of traditional roadway improvements, such as off-site sidewalks, curb extensions, protected bike lanes, upgraded bus shelters, bikeshare stations, and monetary contributions; 2) establishment of standardized Transportation Demand Management (TDM) plans for a project based on land use, type of user, proximity to transit, and vehicle trip mitigation needs; 3) establishment of agency preferred maximum off-street parking ratios that are used as a mitigation test (i.e., higher parking ratio leads to induced demand for driving which means more mitigation is necessary); 4) establishment of criteria for a Low Impact Development CTR/TIA waiver; and 5) incorporation of a Vision Zero perspective into all aspects of site design and public realm design, and guidance for Vision Zero-specific mitigations.

A refocused emphasis on pedestrian safety, TDM programming, minimal off-street parking, and quality project design have been critical to streamlining the development review process, attaining better overall development projects, and helping to meet many of the District’s public policy goals. These include producing more affordable housing, reducing automobile dependency, improving pedestrian and bicycle safety, supporting adjacent transit, and allowing for more sustainable population and employment growth with minimal growth in vehicle traffic. Together, this more comprehensive approach represents a tremendous shift forward for transportation review and can serve as a study approach to be emulated by other agencies seeking to modernize their approaches.

DDOT’s focus on reduced parking originates from a desire to accommodate more density in the District of Columbia, consistent with the targets of the 2021 Comprehensive Plan, 2016 Zoning Regulations, and subsequent Small Area Plans, while generating minimal accompanying vehicular traffic and preserving network capacity for other uses and modes. The District is projected to grow by 187,000 people by the year 2035 (1). Since the roadway network is fully built out and congested during peak commute periods, additional population and employment growth must be accommodated by non-automotive modes and reduced auto-dependency. In the coming years, it is likely that not only will the number of lane miles not increase in the District, but will instead decrease as road diets, bus-only lanes, and protected bike lanes projects are deployed. For this reason, it is even more imperative that parking ratios with new development be minimized since research has demonstrated that the availability of off-street parking, particularly free parking, induces demand for more driving. (2)

There are other benefits to reduced or eliminated on-site parking, as shown in Figure 1 below. The first is that the project saves costs associated with constructing parking spaces and has more site design
flexibility. The space and money recouped from reducing car storage can be replaced with more residential units, green space, or bicycle parking, thus advancing the District’s goals of providing more housing supply and reducing the costs to building housing. In almost every situation, less on-site vehicle parking advances at least one of the District’s sustainability goals (e.g., housing affordability, reduced auto-dependency, increased transit usage, reduced impacts to climate change, improved pedestrian safety, etc.). The second is that buildings with little or no parking bring a population of “transit ready” residents and employees to support adjacent public transportation routes. Residents or office workers that choose to live or work in a building with little or no parking, know of the parking constraints prior to moving in and can make the decision to co-locate their home and office along transit lines. The third is that, in many situations, parking supply can be used as a proxy for personal vehicle travel. Since on-site parking is one of the permanent features of a site that will remain constant as lifestyles, commuting patterns, and modes of travel change, capping or eliminating parking will result in fewer spaces to produce or attract personal vehicle trips for the life of the project, thus also having the potential to reduce Vehicle Miles Traveled (VMT) and carbon emissions. DDOT is planning to collect person trip and parking demand data in the coming years at residential buildings with little or no parking to better understand the potential for mode shift from personal vehicle to transit or ride-hailing. These findings could shed more light on VMT implications of reduced parking.

**Figure 1 | Building Design Before and After Reduced Parking**

![Building Design Before and After Reduced Parking](image)

*Source: Boston Metropolitan Area Planning Council (MAPC) Perfect Fit Parking (used with permission)*

2.0 A Brief History of the Traffic Impact Study

Traffic Impact Studies (TIS)\(^1\) in their modern form date to the 1970s, with most city and state DOTs implementing guidance for creation of their studies through the 1980s and into the 1990s. (3) A TIS is typically used to document the transportation system impacts resulting from a proposed project or development. Most places now require any new development to complete a TIS as part of their

\(^1\) Alternatively known as Traffic Study, Traffic Impact Analysis (TIA), Traffic Operational Analysis (TOA), or Transportation Impact Study (TIS) amongst others. The very name of these studies reflects an auto-centric approach highlighting concern about vehicular traffic.
development review process. These studies compare pre-existing congestion to a proposed scenario with
the project’s expected traffic added to the system. The forecast congestion impacts are often used to
prescribe impact fees, infrastructure investments, or site design requirements. Various guidance manuals
have been created over the years by public agencies (4) (5), advocacy organizations (6), and private
tentities (7) to guide study originators in creation of traffic studies. Today’s most well-known guidance
document is the Institute of Transportation Engineers (ITE) Recommended Practice on the subject,
Transportation Impact Analyses for Site Development. However, relatively little academic analysis has
been conducted on the efficacy of various approaches to traffic studies.

It is clear that most traffic studies have historically taken an auto-centric approach, with little focus on
modes other than the personal vehicle. Many offer a cursory glance at the local transit, or lack thereof,
and leave little room for mitigations focused on upgrading the pedestrian, bicycle, or transit networks or
implementing Transportation Demand Management (TDM) measures. The typical approach seems to
presume that trips to the site will be made via automobile, perpetuating a land use-transportation cycle
that has resulted in more than 85% of all trips in the United States being taken by personal vehicle. (8)
Vehicle infrastructure is built to accommodate anticipated new vehicular trips, in turn inducing further
demand for vehicular travel.

The end goal for most traffic studies is alleviation of congestion. Congestion is a result of more people
trying to move through a space via a certain mode than it was designed for, which leaves people feeling
like it took them longer to get somewhere than it should have. Congestion can be measured in many
ways; typical measures track the amount of time delayed or consider the ratio of travel time to a ‘normal’
time. Usually congestion is measured to track its impact on local economies and travel time. (9) The
typical prescription is added capacity, usually in the form of new roads or added lanes. In fact, research
suggests adding more road capacity is not effective and we cannot build our way out of congestion. (10)
Due to the principle of induced demand—where trips are made easier, more will be made—any gains will
be short-lived.

Society’s negative view of congestion masks a basic misperception. Quite simply, congestion is also a
marker of economic success. A recent study states, “Economic productivity is not significantly negatively
impacted by high levels of traffic congestion. In fact, the results suggest a positive association between
traffic congestion and per capita GDP as well as between traffic congestion and job growth at the
[Metropolitan Statistical Area] MSA level.” (11) To eliminate congestion would be to eliminate economic
production, a result no city desires. Seeking to mitigate congestion often makes sense, but it is often not
the right measure of mobility to evaluate appropriate infrastructure investments associated with
developments. Alternative metrics focused on trip reliability, and highlighting accessibility and person
throughput, likely make more sense.

Since the initial 2012 Beta Version of the CTR Guidelines was introduced, there have been several
noteworthy changes in the industry that DDOT has tried to stay ahead of and innovate. First, with
California’s adoption of SB 743 legislation in 2013, the industry has sought a viable alternative to the
Level of Service (LOS) metric which measures the volume of motor vehicles an intersection can process
in the peak 15 minutes of the day and has dominated the traffic impact study (TIS) review process for
decades. This has led to the overbuilding of roadway capacity in localities and perpetuating a land use and
transportation cycle that has resulted in an automobile dependent society. Second, since the early 2010s,
DDOT has led the industry in moving from a focus on moving automobiles to a focus on moving people
by requiring developers to provide person trip generation estimates in addition to the traditional vehicle
trip generation. Person trip generation captures trips by all other modes, such as transit, walking, and bicycling. In 2017, the Institute of Transportation Engineers (ITE) adopted the person trip methodology in the 3rd Edition of the *Trip Generation Handbook*. DDOT has since contributed person trip data to ITE’s database in each new edition of the *Trip Generation Manual*. Third, in the latter half of the 2010s, many jurisdictions sought to begin evaluating non-automotive modes of travel and bringing them up to parity with the automobile. DDOT was also an early national leader in evaluating and mitigating a development’s impacts to the pedestrian, bicycle, and transit networks.

Interestingly, at the same time DDOT was developing an updated CTR process, the industry seems to have begun recognizing the same shortcomings in the typical TIS approach. For instance, ITE has underway a process to replace their former recommended practice with a new one entitled *Multimodal Transportation Impact Assessment for Site Development (MTIA)*, which includes many of the best practices developed for the *CTR Guidelines*. (12) In California, some jurisdictions have begun exploring use of the vehicle miles traveled (VMT) per capita metric and VMT screening tools in the wake of SB 743, whereby projects located within low VMT per capita areas of a jurisdiction are screened out and exempt from further traffic analysis. These changes happen as more infill development occurs around the country and a holistic multimodal perspective becomes more widespread within DOTs and Planning Departments. Many DOTs are updating their goals to focus less on congestion and more on reliability, accessibility, safety, and person throughput.

In this paper and in the latest version of the *CTR Guidelines*, DDOT proposes using parking ratio as a primary evaluation metric for new developments in transit-rich areas. This turns the evaluation of new development from an exercise in traffic impact assessment into a simplified site design review, with parking ratio serving as a proxy for the automobile mode and acts as a natural cap on the amount of personal vehicle traffic that a project can generate. In addition to meeting DDOT’s preferred maximum parking ratios, a development is expected to implement robust Transportation Demand Management (TDM) programming, improve connectivity to transit and other modes, and provide high-quality site and public space design. These items all work in tandem to reduce the amount of vehicle trips generated by a project and in many cases result in DDOT waiving the formal multimodal CTR study and the vehicle-focused TIS.

As these industry shifts continue, DDOT anticipates its *CTR Guidelines* can serve as a prototype for emulation as other cities grapple with their own land use challenges and modernize their TIS Guidelines. The old TIS model was intended to solve a traffic problem with a traffic solution that is not consistent with the modern vision of an active and walkable city. Perhaps this guidance reflects a 21st century version of the TIS, updated to reflect the needs of a new century.

### 3.0 Prior DDOT Research

DDOT has been an industry innovator in the areas of trip generation, parking demand research, and reforms to the TIS review process going back to the beginning of the 2010s. The process to develop an updated transportation review process at DDOT occurred in parallel to various other research that supported the need to take a multimodal and holistic perspective. In that decade, DDOT released the following research papers, studies, posters, presentations and webtools:

- *Transitioning from Traditional TIS to Comprehensive Multi-Modal Transportation Analysis* (2013)
Each of these DDOT research efforts served as a building block that culminated in the creation of the 2021 CTR Guidelines and a new development review approach.\(^2\)

### 4.0 Evolution of TIAs and CTRs in the District of Columbia

Since the beginning of the 2010s, DDOT’s requirements for transportation impact assessment in the development review process have changed significantly. At the turn of the decade, DDOT typically required a traditional TIS similar to any other urban or suburban jurisdiction in the United States, where traffic impacts were evaluated and then had to be mitigated with agreed upon roadway improvements. As the decade progressed, DDOT started taking a harder line on implementing capacity-increasing roadway improvements due to their detrimental impacts to the pedestrian realm, inducement of additional driving, and negative impacts on usage of non-automotive modes. This new approach that discourages implementation of turn lanes and road widenings allowed DDOT to instead negotiate TDM strategies, reduced parking, and non-automotive network upgrades (e.g., protected bike lanes, curb extensions, missing sidewalks) in lieu of traditional roadway improvements.

In 2012, DDOT released the Beta Version of the CTR Guidelines which changed the name of the required study from Traffic Impact Study to a more multi-modal Comprehensive Transportation Review (CTR). That initial edition of the CTR Guidelines promoted the person-trips methodology that was subsequently adopted by ITE as the industry standard trip generation methodology. The Guidelines also started the process of repurposing the role of the TIA/TIS in the multimodal CTR study to treat other modes equally with the roadway capacity evaluation. As the District grew and changed through the mid-2010s, DDOT’s views also changed on a number of fronts. DDOT wanted more of a focus on pedestrian realm design and safety. This meant not allowing all transportation decisions to flow out of the vehicle-oriented TIA/TIS, but instead prioritize the needs of transit riders, pedestrians, and bicyclists ahead of automobile users. Similarly, there was a change in mindset toward prioritizing the quality of life and safety of District residents rather than focusing on serving the longer roadway-based trips of suburban vehicle commuters.

As DDOT and other researchers in the industry began reviewing trip generation and parking demand research, it became clear that there was a linkage between availability of parking (particularly free parking) and personal vehicle driving. (2) This was a pivotal moment because it established that the high minimum parking requirements were not just a static zoning requirement for new buildings (like a setback

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\(^2\) All the documents, presentations, and tools noted above are available by contacting the DDOT Planning and Sustainability Division (PSD).
or bay window projection), but instead had been an underlying driver of vehicle usage and auto
dependency for decades. These principles aided in the 2016 update to the District’s parking requirements
as part of the rewrite of the prior 1958 zoning regulations. The 2016 zoning update established parking
maximums and greatly reduced, and in some districts entirely removed, the parking minimums.

As the linkages between availability of parking and driving became clearer, DDOT began experimenting
with different methods to account for the parking supply in the CTR/TIA process. DDOT started to allow
developers to cap the site’s vehicle trip generation if the parking supply was provided at a low ratio. For
example, if a 200-unit residential building provides only 20 on-site parking spaces and is proximate to a
Metrorail Station, the maximum amount of exiting morning peak hour traffic and entering evening peak
hour traffic would be capped at 20 vehicle trips because the site cannot physically generate more personal
vehicle trips. DDOT uses professional judgment and an understanding of local commuting patterns to
adjust trip generation calculations to account for potential ride-hailing vehicle trips. In this example, a
project that would have otherwise easily met DDOT’s 25 inbound or outbound vehicle trip threshold with
a larger parking supply, no longer meets the threshold for a CTR or TIA. This method incentivizes
building projects with little or no parking and allows the developer to save costs associated with
conducting a study, funding roadway mitigation, and constructing a parking structure, just by eliminating
or reducing the on-site parking supply. Conversely, if a project significantly oversupplies parking as it
relates to DDOT’s preferred maximum parking ratios, then the assumed auto-mode share is required to be
increased (for example from 65% to 85%) to account for induced demand for driving. DDOT planners
and engineers take a strong stance against requiring any capacity increasing roadway mitigation resulting
from the increased auto mode share distributed through the roadway network, which would further induce
driving and negatively impact the pedestrian realm. Instead, any degradation in LOS identified in the
CTR/TIA are first mitigated with non-auto network upgrades or other TDM strategies.

The 2021 CTR Guidelines update continues the evolution of CTRs/TIAs away from a sole focus on
roadway LOS and toward greater attention to site design, Vision Zero, parking supply, TDM, and public
space design, while keeping LOS as a tool to utilize when needed depending on the context and location
of the project. The Guidelines built upon DDOT research and data collected over the past decade and
established preferred maximum parking ratios for each major land use and ¼ mile distance increments
from high-quality transit (see Section 4.2). Based on a project’s proposed parking supply and any
identified impacts in the CTR/TIA, a set of TDM strategies or non-auto network upgrades must be
implemented to minimize the amount of vehicle trips generated. Standardized TDM Plans, study waiver
criteria, Vision Zero best practices, and clearer mitigation requirements are now provided in the
Guidelines to ensure consistency and effectiveness. The following sections highlight DDOT’s new
approach to comprehensive transportation review.

4.1 New Approach to Site Design and Public Space Design

A well-designed site will minimize the amount of impact on the surrounding transportation network.
Therefore, the developer team should focus first on site access, connectivity, loading design, vehicle
parking, and the pedestrian realm design. Once agreement has been reached on these items and a TDM
program is developed, the remainder of the project can be designed around those elements and a decision
made on whether to conduct or waive any additional traffic or multimodal analyses. To qualify for a Low
Impact Development CTR/TIA waiver, a project must be located within ½ mile of a Metrorail station or
¼ mile of Streetcar or Priority Bus Routes, meet the ¼ mile preferred maximum parking ratio, provide no
more than 100 total parking spaces (this equates to approx. 300,000 SF of development), provide an Enhanced Tier TDM Plan, ensure there is a fully complete and ADA accessible pedestrian network connecting to transit and nearby amenities, provide two (2) electric vehicle (EV) charging stations, and ensure the curb cuts and loading design meet DDOT standards. Constructing a high-quality site and pedestrian realm design with new development is also a key pillar of DDOT’s Vision Zero program.

The *CTR Guidelines* provide greater guidance and emphasis on site design and public space design. It provides best practices for accessibility, high quality pedestrian realm design, and Vision Zero strategies that all developments are expected to follow. Vision Zero strategies that slow vehicles or shorten pedestrian crossing distances include removal of channelized right-turn lanes, installation of curb extensions, minimizing the number of curb cuts, and reducing curb radii, amongst others. With less time spent scoping, conducting, and reviewing a CTR/TIA, DDOT staff and the developer team can focus on pedestrian safety and strategies for reducing vehicle trips. Figure 2 below, discusses each of DDOT’s site review priorities in greater detail.

**Figure 2 | DDOT Site Review Priorities**

<table>
<thead>
<tr>
<th>Design Elements</th>
<th>1</th>
<th>Site Access + Curb Cuts + Connectivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access must be from alley in available; minimize if of curb cuts; break up superblocks; re-establish street grid; provide connections with neighboring properties, community amenities, and transit</td>
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<tr>
<th>2</th>
<th>Loading Design + Operations</th>
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<tbody>
<tr>
<td>Must have head-in/head-out truck maneuvers from loading berms and alley entrances; no backing through public space; must accommodate loading/flush operations on private property</td>
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<table>
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<tr>
<th>3</th>
<th>Vehicle Parking Supply</th>
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<tbody>
<tr>
<td>Minimize if of parking spaces particularly near Metro rail stations; parking pricing for on-site spaces; if rates exceed DDOT’s preferred max rates in CTR Guidelines then provide added TDM or non-auto commitments</td>
<td></td>
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<tr>
<th>4</th>
<th>Vision Zero + ADA + Public Realm Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>High quality streetscape; ADA accessible pedestrian facilities; implement Vision Zero pedestrian safety improvements (curb extensions, clear slip lanes); do not externalize private site operations into public space</td>
<td></td>
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</table>

<table>
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<tr>
<th>5</th>
<th>Bicycle Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meet or exceed zoning requirements for bicycle racks and showers/charging facilities in easily accessible locations; look for opportunities to convert traditional bike lanes to protected lanes</td>
<td></td>
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<table>
<thead>
<tr>
<th>Travel Assumptions</th>
<th>6</th>
<th>Multi-Modal Trip Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand development’s anticipated market area and who is coming to the site (regional or neighborhood-oriented); which modes do people use to travel to the site; person trip generation + mode splits</td>
<td></td>
<td></td>
</tr>
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<tr>
<th>7</th>
<th>TDM Programming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Must provide robust TDM plan to encourage non-auto travel; additional TDM programming to offset induced demand from over parking and traffic impacts; TDM plan tailored to each land use and anticipated user</td>
<td></td>
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</tbody>
</table>

<table>
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<tr>
<th>8</th>
<th>Curbside Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine and address anticipated curb cuts; address rapidly evolving pick up/drop off trends; minimize truck conflict with bikes and pedestrians</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Traffic Analysis</th>
<th>9</th>
<th>Traffic Impact Analysis (TIA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDOT may waive CTR/TIA if satisfied with #1-8 above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Source: 2021 DDOT Guidance for Comprehensive Transportation Review, Version 2.0*

**4.2 New Approach to Off-Street Parking**

DDOT is the first in the nation to include a parking supply evaluation as part of the TIS process that assesses “impacts” and “mitigation” for potential induced demand due to the over-supply of off-street
parking. As discussed in 1.0 Introduction, there are several benefits to the transportation system and to the advancement of other important public policies and societal goals from reduced off-street parking.

DDOT developed preferred maximum parking ratios that differ by land use and ¼ mile increments to high frequency transit. The rates were based on a combination of methodologies including the District’s desired mode share goal and prior residential parking demand data collection. DDOT’s 2015 MoveDC Mobility Plan and the District’s 2020 Comprehensive Plan Framework calls for a District-wide 75% non-automotive mode share goal. Meeting the parking evaluation criteria in the CTR Guidelines (Figures 3 and 4 below) in conjunction with implementation of robust Transportation Demand Management (TDM) strategies are key tools in achieving that vision as new development is approved. Use of parking ratio as the primary evaluation metric, rather than LOS, has turned DDOT’s evaluation of new transit-oriented infill development from an exercise in traffic impact assessment to a site-based design review.

DDOT’s preferred maximum parking ratios for all uses were calculated based upon mode share goals and assumptions made for the number of residents/unit, GSF/hotel room, or employees/GSF, as observed in recently approved developments. Mode share goals increase from 65% to 85% non-automotive as a site gets closer to a transit station, which on average should match or advance the District-wide 75% non-auto goal. For residential uses, the max parking ratios were also validated based on prior data collected by DDOT at 115 residential buildings around the District in 2014-15. (13) The natural demand for parking observed during that timeframe was slightly higher than the rates selected for the development review parking supply test in Figure 3 (for example observed demand for residential parking in 2014 was closer to 0.35-0.40 spaces/unit within ¼ mile of a Metrorail Station). For sites within 1/8 mile from a Metrorail station, which captures developments on top of and within one block of a station, DDOT encourages the developer to provide zero (0) on-site parking when possible and to justify the inclusion of any parking.

**Figure 3 | DDOT-Preferred Maximum Parking Ratios for Off-Street Parking**

<table>
<thead>
<tr>
<th>Land Use</th>
<th>&lt; ¼ mile of Metrorail</th>
<th>&lt; ¼ mile of Metrorail OR &lt; ¼ mile of Priority Bus/Streetcar</th>
<th>&lt;1.0 mile of Metrorail</th>
<th>&gt;1.0 mile of Metrorail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on Mode Share Goal:</td>
<td>85% Non-Auto</td>
<td>80% Non-Auto</td>
<td>75% Non-Auto</td>
<td>65% Non-Auto</td>
</tr>
<tr>
<td>Residential</td>
<td>0.25 or less spaces/unit</td>
<td>0.35 or less spaces/unit</td>
<td>0.40 or less spaces/unit</td>
<td>0.55 or less spaces/unit</td>
</tr>
<tr>
<td></td>
<td>~1 per 4 units</td>
<td>~1 per 3 units</td>
<td>~1 per 2.5 units</td>
<td>~1 per 2 units</td>
</tr>
<tr>
<td>Office</td>
<td>0.40 or less spaces/1k GSF</td>
<td>0.50 or less spaces/1k GSF</td>
<td>0.65 or less spaces/1k GSF</td>
<td>0.85 or less spaces/1k GSF</td>
</tr>
<tr>
<td></td>
<td>~1 per 6 employees</td>
<td>~1 per 5 employees</td>
<td>~1 per 4 employees</td>
<td>~1 per 3 employees</td>
</tr>
<tr>
<td>Hotel</td>
<td>0.35 or less spaces/1k GSF</td>
<td>0.45 or less spaces/1k GSF</td>
<td>0.60 or less spaces/1k GSF</td>
<td>0.75 or less spaces/1k GSF</td>
</tr>
<tr>
<td></td>
<td>~1 per 6 rooms</td>
<td>~1 per 5 rooms</td>
<td>~1 per 4 rooms</td>
<td>~1 per 3 rooms</td>
</tr>
<tr>
<td>Retail</td>
<td>1.00 or less spaces/1k GSF</td>
<td>1.25 or less spaces/1k GSF</td>
<td>1.60 or less spaces/1k GSF</td>
<td>2.00 or less spaces/1k GSF</td>
</tr>
</tbody>
</table>

*Source: 2021 DDOT Guidance for Comprehensive Transportation Review, Version 2.0*
4.3 New Approach to Transportation Demand Management (TDM)

TDM is a set of strategies and policies at a specific development that work in tandem with reduced parking, priced parking, and nearby transit to minimize site-generated vehicle trips. The CTR Guidelines provide standardized TDM plans by land use, user type, and project impact. There is no citywide TDM ordinance in the District of Columbia, like in many other jurisdictions, so TDM plans must be negotiated on a case-by-case basis. TDM is also self-enforced by DDOT due the lack of resources within other District government agencies typically tasked with enforcing zoning regulations and proffers. Prior to the launch of the 2021 CTR Guidelines, DDOT rolled out new internal processes and procedures, as well as new TDM monitoring strategies, to better ensure developer TDM commitments continue to be implemented years after a building has opened.

There are three tiers of plans, each tied to the amount of excess on-site parking and identified traffic impacts. The Baseline Plan includes relatively inexpensive and easy to implement strategies like unbundled parking, appointing a site TDM coordinator to work with DDOT’s TDM program, providing welcome packets to new residents highlighting non-auto options, and designing bike facilities to accommodate non-traditional bikes. The Enhanced Plan builds on the Baseline Plan and includes items that are more expensive to implement. These include installing a digital transit information screen, installing additional bike parking, and agreeing to not lease out excess unused parking to other buildings.

The Enhanced Plus Plan is for sites that are significantly over-parked or have unmitigated intersection impacts and are intended to be substantive enough that they act as a disincentive to over-parking the site. These include a multi-year commitment to providing bikeshare memberships to all residents or
employees, installing a 19-dock Capital Bikeshare station, providing SmarTrip cards preloaded with fares, cash contributions to the Transportation Mitigation Fund, and a package of non-automotive improvements. Refer to Appendix C of the CTR Guidelines for standardized TDM plans for the residential, office, retail, and hospitality land uses.

In situations where a project exceeds 1 million GSF of development (e.g., DC Wharf or McMillan redevelopment) or is projected to have a high single occupancy vehicle rate (e.g., Campus Master Plans), the TDM Plan must be accompanied by a Performance Monitoring Plan (PMP). The PMP includes trip and mode share goals for the campus, data to be collected annually, reporting requirements, sunsetting provisions (if any), and penalties for not meeting trip and mode share targets. PMP parameters for select examples are included Appendix D of the CTR Guidelines.

Shifting to a parking evaluation metric with TDM programming in order to streamline the development review process has lessened the role of the LOS analysis. Developers can now more easily receive a waiver from the multimodal CTR study or TIA—in many situations if the project has a parking ratio below DDOT’s parking benchmarks and meets other criteria, as discussed in Section 4.1. A TIA is still be required for larger projects, if there is a specific concern about ingress and egress at a site’s driveway(s), or if a major operational roadway change is proposed (e.g., lane reductions, converting one-way to two-way, etc). In situations where a CTR or TIA is waived by DDOT, a more abbreviated Transportation Statement is required which documents the project’s trip generation, site operations, TDM program, and commitments for physical improvements.

4.4 New Approach to Mitigation

DDOT’s approach to mitigation of vehicle impacts is to first make changes on or near the site (e.g., reduced parking, TDM programming, streetscape, better connectivity, pedestrian improvements) to reduce the demand for vehicles going through intersections projected to fail in the LOS analysis, rather than widen roads and intersections to accommodate projected vehicle trips. DDOT does not accept roadway capacity increasing improvements identified in the LOS analysis for a land development project since they are detrimental to the safety and design of the public realm, further induce vehicular trips, and negatively impact usage of non-auto modes. Instead, mitigation for most traffic impacts can be addressed with reduced parking, strengthened TDM Plan, non-auto network upgrades, and/or cash in-lieu. In fact, DDOT has worked with several developers since 2019 to convert previously negotiated roadway improvements into a cash in-lieu contribution to the newly created Transportation Mitigation Fund. Once in the Mitigation Fund, the monies are available for DDOT to use on other non-auto network improvements, to supplement future data collection and research efforts, or to wrap into a future intersection redesign.

Figure 5 below is a simplified matrix outlining DDOT’s TDM and mitigation requirements based on the two (2) mitigation tests (parking supply and traffic impacts) and is intended for projects 500,000 GSF or smaller. Projects that fall into the upper left-hand corner of the table need only provide a Baseline or Enhanced TDM Plan to gain DDOT’s recommendation of approval. For straightforward projects, this agreement can often be completed in the pre-application meeting and may require no further study or follow-up. Projects with more parking and/or traffic impacts falling elsewhere in the table are required to provide an Enhanced Plus Plan and performance monitoring, non-auto network upgrades, or a monetary contribution to the Transportation Mitigation Fund, as DDOT deems necessary. DDOT expects this
simplified approach to mitigation will incentivize more development in transit accessible areas with minimal accompanying off-street parking.

As an example, in Fall 2020, DDOT staff reviewed a mixed-use development located less than ¼ mile from the Navy Yard-Ball Park Metrorail Station, consisting of 608 residential units, 24,000 GSF of first floor retail, and 311 parking spaces (5 Street SW, ZC 20-14). Based on the parking test criteria outlined in Section 4.2 above, this project was over-parked by 104 spaces (DDOT’s max parking ratios of 0.30 spaces/residential unit and 1.00 space/1,000 GSF retail near a Metrorail Station yield a preferred maximum of 207 spaces). Additionally, the project impacted four (4) nearby intersections by degrading LOS from either E to F or from F to a worse F due to the addition of site-generated traffic. In lieu of the developer’s recommendation for signal timing adjustments, DDOT utilized the matrix in Figure 5 to negotiate a package of non-automotive improvements as mitigation for the high parking ratio (i.e., more induced demand for driving) and the impacted intersections.

The mitigation package agreed to by both DDOT and the developer included: 1) Enhanced TDM Plan (Tier 2 strategies) with annual bikeshare memberships for all residents in the first year after initial lease-up; 2) installation of two 4-dock Capital Bikeshare expansion plates at a nearby station; 3) construction of three curb extensions; 4) contribution of $90,000 to the Transportation Mitigation Fund for bicycle, pedestrian, or transit improvements within the project’s Advisory Neighborhood Commission boundaries (ANC 6D) to be determined by DDOT at a later date; and 5) a relocated bus stop with a new bus pad. The costs and effectiveness of these non-automotive improvements were weighed against traditional roadway capacity increases and determined to be more beneficial to the residents of the neighborhood while advancing many of the District’s policy goals.

Figure 5 | Mitigation and TDM Requirements Based on Parking Supply and Traffic Impacts

<table>
<thead>
<tr>
<th>TRAFFIC IMPACTS</th>
<th>No Impacts or No CTR/TIA Required</th>
<th>Minor Impacts at One Intersection</th>
<th>Minor Impacts at Multiple Intersections</th>
<th>Severe Impacts at One or More Intersections</th>
</tr>
</thead>
<tbody>
<tr>
<td>At or Below Benchmark</td>
<td>Baseline TDM Plan</td>
<td>Baseline TDM Plan</td>
<td>Enhanced TDM Plan</td>
<td>Enhanced TDM Plan + Direct Mitigation OR Additional TDM OR Monetary Contribution OR Non-Auto Upgrades OR Performance Monitoring TBD</td>
</tr>
<tr>
<td>Up to 10% Over-Parked</td>
<td>Baseline TDM Plan</td>
<td>Enhanced TDM Plan</td>
<td>Enhanced TDM Plan + Additional TDM OR Monetary Contribution OR Non-Auto Upgrades to be negotiated</td>
<td>Enhanced TDM Plan + Direct Mitigation OR Additional TDM OR Monetary Contribution OR Non-Auto Upgrades OR Performance Monitoring TBD</td>
</tr>
<tr>
<td>Up to 20% Over-Parked</td>
<td>Enhanced TDM Plan</td>
<td>Enhanced TDM Plan + Additional TDM OR Monetary Contribution OR Non-Auto Upgrades to be negotiated</td>
<td>Enhanced TDM Plan + Additional TDM OR Monetary Contribution OR Non-Auto Upgrades to be negotiated</td>
<td>Enhanced TDM Plan + Direct Mitigation OR Additional TDM OR Monetary Contribution OR Non-Auto Upgrades OR Performance Monitoring TBD</td>
</tr>
<tr>
<td>Over 20% Over-Parked</td>
<td>Enhanced TDM Plan + Additional TDM OR Monetary Contribution OR Non-Auto Upgrades to be negotiated</td>
<td>Enhanced TDM Plan + Additional TDM OR Monetary Contribution OR Non-Auto Upgrades to be negotiated</td>
<td>Enhanced TDM Plan + Additional TDM OR Monetary Contribution OR Non-Auto Upgrades to be negotiated</td>
<td>Enhanced TDM Plan + Direct Mitigation OR Additional TDM OR Monetary Contribution OR Non-Auto Upgrades OR Performance Monitoring TBD</td>
</tr>
</tbody>
</table>

*Source: 2021 DDOT Guidance for Comprehensive Transportation Review, Version 2.0*
4.5 Lessons Learned Upon Implementation

Since the launch of CTR Guidelines Version 1.0 in 2019, there have been a number of lessons learned and successes observed during the application of the new development review processes and CTR requirements. These helped inform the 2021 update. For staff, DDOT’s review of developments has evolved from an exercise in traffic impact assessment and all the technical analysis that goes with it (e.g., reviewing Synchro inputs, developing background growth rates, etc.) to more of a project design review. This has resulted in fewer staff hours being spent across multiple agency divisions on the scoping and review of CTRs due to the “right-sized” scoping of studies and in many cases waiving of studies. A greater focus on design, streetscape, public space activation, and tactical urbanism and less focus on Synchro, traffic signals, and traffic operations has changed the skillsets being sought in new employees hired into the DDOT Neighborhood Planning Branch where the development review function resides. Neighborhood Planning staff is able to leverage the expertise of traffic engineers and signal designers within the agency, as needed.

When required, CTRs have been scoped to meet the needs of the project and to answer questions about the project DDOT is asking, rather than a blanket evaluation of numerous intersections surrounding every site. CTR waivers have resulted in a reduction of about 1/3 the number of scoping forms and studies submitted to DDOT for review in 2020 as compared to 2019 and previous years. Fewer studies have resulted in quicker staff reviews of projects and greater frequency of reports submitted on-time to the zoning bodies. Regardless of whether a CTR is required, DDOT staff continues to negotiate lower parking ratios, more robust TDM plans, contributions to the Transportation Mitigation Fund, and more non-automotive physical improvements as compared to previous years.

More comprehensive documentation of DDOT requirements in the CTR Guidelines has resulted in site design, parking supply, TDM requirements, and mitigation negotiations being resolved much earlier in the development process, often as early as the pre-application meeting. This has prevented a lot of back-and-forth with the developer team in the week leading up to the zoning hearing. DDOT reports have evolved from calling out items that developers need to remedy to documenting agreements on TDM and mitigation that have already been reached between the parties, allowing for a ‘cleaner’ hearing with the zoning bodies. Regardless of whether a CTR is required, DDOT staff continues to negotiate lower parking ratios, more robust TDM plans, contributions to the Transportation Mitigation Fund, and more non-automotive physical improvements as compared to previous years.

Feedback from the development community has been generally positive. DDOT’s CTR and mitigation requirements are now much clearer and asks are more consistent, which allows the developers to better predict and budget for transportation improvements. DDOT’s published preferred maximum parking rates have given developers cover with financial lenders and the adjacent residential communities who generally want to see more off-street parking, not less. One interesting and unexpected outcome of DDOT waiving CTRs has been the advent of “defensive TIA.” These are traffic studies that communities have requested the developer conduct in order to gain the ANC’s recommendation of approval, even when DDOT has determined the analysis is not necessary to gain agency approval. This situation most often occurs with infill developments that have a low parking ratio, mixed land uses, a short walk to transit, and mitigation that has already been negotiated.
5.0 Applicability to Other Jurisdictions

DDOT’s development review approach and CTR Guidelines were an evolution over more than a decade to address challenges specific to the District of Columbia and have adapted to local laws and systems that may be different than most other jurisdictions. That said, the authors expect the underlying philosophies, as well as many aspects of the CTR Guidelines themselves, will be broadly applicable to urban and transit-rich cities throughout North America. To determine if DDOT’s model should be adopted entirely or only individual components in certain situations, it is best to understand the circumstances these processes and practices have evolved in the District:

- The District of Columbia has a robust Metrorail network with ½ mile walksheds covering large swaths of the city, as shown in Figure 4 above, allowing much of the city to not be auto dependent. One-half mile is generally considered the maximum expected distance people will walk regularly to access rail transit for the purpose of commuting to work. Many of the areas remaining in the District without Metrorail service are captured with ¼ mile walksheds to Streetcar, Circulator, and Priority Corridor Metrobus Routes. It cannot be stressed enough that access to high-frequency and high-quality mass transit is the linchpin that allows a city to permit much higher densities, greatly reduce auto-dependency, and make a significant shift in how new development is reviewed.

- The Height Act of 1910 caps the height of buildings at 130 feet throughout the District, which has resulted in no buildings constructed taller than approximately 13 stories. As such, this paper and the CTR Guidelines do not contemplate taller buildings and higher densities that may be permitted in other cities. However, very few cities are building at a scale denser than the District.

- DDOT has wider flexibility to negotiate with developers through the land development approval process and more ability to impose conditions during curb cut approval (for by-right projects that do not require zoning approval) than many other cities. The District’s zoning approval process allows for mitigation to be negotiated with District agencies and the developers and other community benefits and amenities be negotiated through the ANC (depending on type of development application). Unlike many other jurisdictions, the District has no “adequate public facilities ordinance” and DDOT is not required to accept TIA-recommended road widening or other vehicle-inducing auto-oriented improvements.

- DDOT has been given the regulatory authority to determine what a “transportation impact” is and what appropriate “mitigations” should be required. The ability to replace roadway improvements recommended by a TIA with non-automotive improvements or monetary contribution of comparable cost, effectiveness, or quality of life improvement was critical to the evolution of CTRs and the Guidelines over the last decade. Additionally, the CTR Guidelines are not approved by the District Council or Zoning Commission, so DDOT has more ability to experiment with best practices and incorporate new research into the requirements more quickly. Additionally, the District does not have an impact fee mechanism. While this approach would inform such fee structures, DDOT individually negotiates improvements on a project by project basis.

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3 Advisory Neighborhood Commissions (ANC) are a unit of District government made up of elected representatives from the community. Each of DC’s 8 wards has 6-8 ANCs each consisting of 6-8 Single Member Districts (SMD).
• As a State, County, and City Department of Transportation wrapped into one, DDOT controls virtually all roads in the District, except for streets around the National Mall and nearby monuments and Federal facilities. This means DDOT issues all curb cut permits and has entire decision-making power over the design of streets. One challenge many local jurisdictions face is that State DOTs often control roads through a town or city’s downtown and they frequently opt to make those streets as wide as possible, in conflict with local goals for slower traffic and safer spaces for pedestrians and cyclists. Additionally, policies are not imposed on the District by a state government, like with California and SB 743.

• The District is faster-growing than most American cities and most new developments are transit-oriented. Between 2005 and 2019, the District’s population grew by nearly 139,000 to 706,000 residents, approximately 24% growth over 15 years. (14) In the 2010s, approximately 88% of new residents to the District were car-free according to the American Household Community Survey (15) and 78% of all new development was within ½ mile of a Metrorail Station. (16) (17)

• The District does not have a city-wide Transportation Demand Management (TDM) ordinance, like some other cities, so TDM plans must be negotiated on a project by project basis and agreed to plans codified in a myriad of different types of approvals, depending on whether it is a by-right project or not (e.g., zoning order, curb cut permit, etc.). This paper does not necessarily advocate exclusively for this method as there are numerous other models and examples around the world, such as establishing a Transportation Management Association (TMA)\(^5\) for a college, hospital campus, or central business district of a city or implementing an impact fee program, as aforementioned, whereby funds are pooled for best use by the transportation agency.

DDOT’s new development review model, as discussed throughout this paper, is best suited in a jurisdiction or sub-area that is relatively dense and has high quality and high frequency transit. DDOT and the DC Office of Planning coordinate land use and transportation planning to ensure that uses are adequately mixed and density is clustered near transit. Even if other jurisdictions opt not to take DDOT’s CTR Guidelines regime wholesale, there are a number of strategies and takeaways that can be “food for thought” as policies and TIA Guidelines are developed. DDOT encourages the following most effective practices be considered regardless of jurisdiction size, transit coverage, culture of auto-dependency, or relative population and economic growth:

• Understand that planning for auto-oriented development will yield higher traffic-generating development. As such, consider not letting roadway capacity be the limiting factor with adjacent land development density, especially in transit adjacent areas. To accomplish this, cultivate a culture of pushing back against roadway capacity increases with new development and formulate policies and processes for accepting non-automotive network improvements or cash in-lieu of additional roadway capacity. This may require changes to agency policy, a jurisdiction’s laws, or planning framework.

• Improve the coordination of land use and transportation planning at the Comprehensive Plan/Master Plan level and conduct adequate analysis to ensure transit and other modes

\(^4\) These are controlled by the National Park Service (NPS) or Architect of the Capitol (AOC).

\(^5\) Sometimes known as a Transportation Management Organization (TMO) or Transportation Management District (TMD).
appropriately support the planned densities and land use mix. Then, at the time of site
development, the review should focus on conformance to the Comprehensive/Master Plan, site
access, site operations, parking supply, surrounding streetscape design, and TDM programming.

- Focus on site design, pedestrian safety, and multimodal person-trip options first before traditional
  traffic impact study considerations. In a 21st century city, every development should be
  considered multimodal. Sidewalks providing ingress and egress to and from the development to a
  robust pedestrian network as well as on-site bicycle accommodations should be an absolute bare
  minimum requirement for any development. As such, policies should be in place such that every
  jurisdiction can require every development fulfill the basic infrastructure requirements to provide
  such a multimodal environment. Also, consider other policy goals, aside from vehicle congestion
  relief, including equitable mobility options, Vision Zero, impacts to housing and access to the job
  market, etc., depending on the jurisdiction’s unique needs.

- Develop criteria for determining whether a project has de minimis impacts to the transportation
  network and create a TIA waiver based on the criteria deemed most important (for example the
  DDOT waiver is based on size of project, proximity to transit, parking supply, and completeness
  of pedestrian network). Right-size the scope of transportation studies to answer questions the
  jurisdiction is seeking to be answered.

- If looking for an alternate metric to LOS, consider establishing parking caps similar to DDOT,
  focusing first on Metrorail, light-rail, and bus rapid transit station areas. Ensure there is an
  adequate land use mix so if a resident or employee forgoes owning a personal vehicle, other
  amenities are within walking or biking distance. This method can be done in conjunction with a
  vehicle-miles travelled (VMT) metric (see California) or pro-rata share district (see Montgomery
  County, MD) and established at the comprehensive plan, sector plan, zoning ordinance, or TIA
  study guidelines level, depending on the jurisdiction.

- When conducting a TIA, compare the vehicle trip generation estimates with the parking supply
  and use professional judgment to determine if the assumed automobile mode split should be
  adjusted upward or downward. This method can account for induced demand for driving or cap
  the vehicle trip generation at a low amount where those trips cannot physically be generated due
  to limited on-site parking. Also use professional judgment to account for the potential of ride-
  hailing trips if trip generation is capped due to the presence of fewer parking spaces.

- Move the development review function out of the traffic engineering group and into
  transportation planning or urban design group. DDOT placed this function within the
  Neighborhood Planning Branch which is made up of urban planners, urban designers, and
  transportation planners. This group views development through the prism of place-making,
  streetscape design, and pedestrian safety. The development review team can still leverage the
  expertise of traffic engineers and signal designers when needed. Additionally, agency managers
  and planners should embrace a culture of innovation and experimentation in the development
  review function.

In short, most cities are similar enough to the District for this new approach to transportation impact
analysis to make sense for them to explore the tactics presented in the new CTR Guidelines. Importantly,
this means accounting for induced demand, prioritizing pedestrian infrastructure investment, providing
incentive for developers to meet site design and TDM minimums, using LOS to understand areas of multimodal conflict, and focusing on the proposed parking ratio.

6.0 Further Research and Exploration

Following the release of the forthcoming 2021 CTR Guidelines, DDOT planners and researchers will continue to stay abreast of and participate in various research efforts to develop best practices in a number of important areas that can be incorporated into future Guidelines updates. These include 1) inclusion of equity considerations in the development review process (e.g., mobility for different lifestyles, stages of life, geographic areas, and socioeconomic groups); 2) continued exploration of linkages between parking, auto-ownership, trip generation, and shared mobility service; 3) innovations in trip generation methodologies that specifically break out vehicle trips by ride-hailing services; 4) implications to mode shift, transit ridership, auto ownership, and curbside usage as a result of reduced off-street parking; 5) quantifying the impacts of individual and cumulative TDM strategies; 6) usage of a VMT metric, as in California, at the site development level, 7) exploration of the factors that make an area non-auto dependent and how to incorporate new tools (i.e., Walk Score) and policies into the development review program to advance this goal; and 8) preparation for connected and autonomous vehicles (CAV) and ensuring these technologies do not encourage more single-occupancy vehicle usage, sprawl and longer VMTs, or undermine public transit usage.

7.0 Conclusion

The planning team at DDOT set out in the early 2010s to establish a new, more comprehensive, prototype for measuring and mitigating multimodal transportation impacts from development. The CTR Guidelines were developed as part of this effort to streamline DDOT’s development review process, get better quality development, and better align mitigation ‘asks’ with agency and District policy goals (such as increased housing production and reduced auto dependency), all while reducing the amount of staff resources dedicated to this function. The process to establish and then mature this guidance, as well as the factors and variables included in this new review, represent a significant leap forward for understanding the transportation impacts resulting from new development. Included in the CTR Guidelines are new approaches for evaluating the appropriateness of proposed off-street parking supply, linking the proposed parking supply to induced demand for driving, and providing more consistent mitigation guidelines that allow greater leverage of traffic impacts to realize offsetting non-auto network improvements. This guidance can serve as a template for other transportation agencies throughout North America, particularly in cities with high quality transit access.

The CTR Guidelines are a product of nearly a decade of research, data collection, and industry collaboration by DDOT planners. DDOT has carved out a niche expertise in the areas of urban trip generation, parking demand, and reforms to the TIA process, and has presented on these topics at numerous ITE and TRB conferences. These guidelines represent, in many ways, the culmination of this

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6 If any public agencies, research organizations, or private entities are currently innovating in these areas or would like to collaborate on a future effort, contact the lead author.
7 In 2020, DDOT presented this new approach at the ITE Annual Meeting and Vision Zero Cities Conference and on two (2) webinars in 2019, one for ITE and one for the TRB Transportation and Land Use Committee. The CTR Guidelines and an accompanying summary presentation can be found at https://ddot.dc.gov/node/470382.
decade of research and the guidance developed is well suited for other jurisdictions to use and allow the
total transportation industry to take a step forward in the realm of transportation impact analyses.

Specifically, there are five (5) key areas of innovation other cities should implement policy around. These
include:

- Repurposing LOS analysis to guide selection of non-auto infrastructure improvements;
- Establishing prototype TDM plans with increasing requirements dependent on trip production;
- Establishing off-street preferred maximum parking ratios;
- Establishing criteria for a waiver from a CTR or TIA;
- Incorporating a Vision Zero perspective in development impacts mitigation.

Further, transportation agencies must account for induced demand in traffic analysis, prioritize pedestrian
infrastructure investment, and provide strong incentive for developers to meet site design and TDM
minimums. DDOT looks forward to seeing industry guidance shift to incorporate these understandings.\textsuperscript{8}

Cities should continuously evaluate and modernize their approaches to development review and
transportation analyses to ensure their methods match their stated mobility missions. In many cases,
adjustments are possible that will incentivize positive change while disincentivizing development
components that will not further their City or agency goals. The Authors hope the \textit{CTR Guidelines} from
the District of Columbia’s Department of Transportation help others prioritize multimodal and people-
centered approaches to transportation reviews.

\textsuperscript{8} DDOT is ready and willing to provide technical assistance or resources to other jurisdictions contemplating
changes in these areas, and interested jurisdictions are encouraged to reach out to the lead author. Since the 2019
Version 1.0 release, DDOT has engaged in conversations with large and medium-sized cities about incorporating
components of the \textit{CTR Guidelines} approach into their latest TIA Guidelines update, including Boston, Austin,
Seattle, San Francisco, Buffalo, Madison, Toledo, and Pittsburgh.
Citations


(2) Currans, Abou-Zeid, Iroz-Elardo; Linking Residential Parking to Automobile Transportation Impact Outcomes at a Development Level; 2020 TRB Annual Meeting Presentation.


(6) Recommended Practice: Transportation Impact Analyses for Site Development (TIASD); Institute of Transportation Engineers (ITE); 2010.


(12) Proposed Recommended Practice: Multi-modal Transportation Impact Analysis for Site Development (MTIASD); Institute of Transportation Engineers (ITE); Forthcoming 2021. MTIASD Purpose and Need Paper (August 9, 2017): https://www.ite.org/pub/?id=00E34098-C5AA-936A-62FC-6F86906FD000


(15) Chung, Payton; 88% of New DC Households are Car-Free; Greater Greater Washington; September 12, 2014. https://ggwash.org/view/35905/88-of-new-dc-households-are-car-free
