



Level of Service White Paper

New Castle County, Delaware | Unified Development Ordinance

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Introduction

New Castle County implemented a “concurrency” ordinance that applies Level of Service (LOS) standards for transportation to development applications. This White Paper evaluates Article 11 of the Unified Development Code (UDC) and Delaware’s State program, and assesses the concurrency programs of 4 other County governments that are similar in size to New Castle County. It concludes with a discussion of issues and potential actions items for the County to consider relative to its transportation LOS.

Overview

What is Transportation Level of Service (LOS)?

Concurrency is a type of land development regulation that is commonly found in high-growth states or communities. Concurrency regulations (also known as adequate public facility ordinances [APFOs]) establish standards and procedures to ensure that necessary public facilities and services to support new development are available and adequate at the time that the impacts of new development occur.¹

While land use decisions (such as rezonings or subdivision plats) are commonly conditioned or denied on the basis of public facilities or traffic congestion issues, the defining feature of a concurrency system is its comprehensive nature. First, while discretionary land use decisions may involve ad hoc reactions to facility congestion, a concurrency system employs a definite standard referred to as level of service (LOS). Second, concurrency is part of an overall planning process tied to the community or service provider’s fiscal powers as expressed in a capital improvements program (CIP). This considers not only existing capital improvements (such as roads), it also involves future improvements that are funded in a CIP.

The 10 major components of a concurrency system are as follows:

- (1) The **areas, and sub-areas, of the community where concurrency applies**. Concurrency regulations may or may not be appropriate for every area of a community depending on the present service capacity of each area and sub-area and its long-range planning goals. For example, if the County is trying to encourage more efficient, compact development patterns in places where infrastructure is already in place, a uniform traffic LOS would encourage development in uncongested locations – typically, those that remote from existing built-up areas.
- (2) The **public facilities and services subject to concurrency**. In many jurisdictions, concurrency only applies to roadways and intersections, though these ordinances can be expanded to include water, schools, pedestrian and public transit facilities, or other community infrastructure needs depending on local needs and legal authority. Communities may also consider if facilities funded and constructed in
- the jurisdiction by state and federal agencies, such as highways, should be included.
- (3) The **LOS standard** for each public facility or service subject to concurrency. A LOS standard measures the capacity and performance characteristics of each facility included in a concurrency ordinance. It governs the rate and amount of development approvals, the quality of infrastructure, and the capital investment needed to correct existing deficiencies and to accommodate new growth.
- (4) **Current and projected public facility and service capacities**. The ordinance should indicate the current LOS standards and plan for future capacities as identified in a CIP.
- (5) The **types of developments/land uses to which the APFO will apply**. The ordinance should describe the types of permitting actions to which the ordinance applies. For example, the ordinance could apply to rezonings, subdivision plats, or other types of permits. The ordinance may exempt certain types of development, such as

projects that have minimal effects on public facilities.

- (6) The **types of development approvals/permits** to which the APFO will apply. Concurrency regulations should not apply to construction activities that do not affect public facilities (e.g., signs). For New Castle County, state law appears to require a traffic impact evaluation at the rezoning stage of approval, but is silent as to other types of zoning or subdivision plat approvals.²
- (7) The **point in the development approval process** when adequacy of public facilities is determined. The County must determine at what stage or stages in the development approval process a determination is made of whether facilities are adequate to accommodate the impacts of development. In New Castle County, this applies to rezoning or major land development approvals.
- (8) The **effect of failing to meet a LOS standard**. Development projects and permits may be denied if they fail to meet LOS standards. The ordinance should define criteria for whether projects will be denied or conditioned and specify appropriate mitigation measures.
- (9) The **conditions and mitigation requirements** that may be attached to concurrency approval. Developers whose projects are denied approvals under concurrency regulations might choose to advance those facilities to allow the project to proceed, or to mitigate the impacts of the project. The ordinance should include criteria to evaluate the proposed mitigation measures and the regulations governing the reservation of capacity as facilities are advanced.
- (10) The **reservation of facility capacity**. When developments are approved or exempted, the demand for public facilities created by those developments is debited against available facility ca-

capacity. The ordinance should indicate the duration for which the capacity can be debited and address other issues of facility capacity.

This White Paper focuses on the critical metric in a concurrency regulation – i.e. the LOS standard for public facilities. The adopted LOS will influence the amount and timing of growth and development permitted in a traffic study area, and the level of public/private investment needed in order to achieve and maintain that standard. In Florida, where concurrency has been part of the state’s growth management legislation for over three decades, “level of service” is defined as follows:

“Level of service” means an indicator of the extent or degree of service provided by, or proposed to be provided by, a facility based on and related to the operational characteristics of the facility. Level of service shall indicate the capacity per unit of demand for each public facility.³

As a means of measuring performance, an LOS standard should take into consideration both the capacity of a public facility and the demand currently and potentially placed on the public facility from existing development, approved developments, and projected future growth. By comparing the demand to the capacity of a public facility, the County may determine how much of the capacity of a given facility may be allocated to development within a designated area upon project approval.

For transportation, conventional practice is to use an alphabetical rating system for streets based upon traffic volumes compared to the rated capacity of the street.⁴ This rating is based on the Transportation Research Board’s *Highway Capacity Manual*, which is referenced in the New Castle County UDC’s definition of “level of service” (see discussion under Current LOS Program, below).⁵ While LOS can also be based on volume-to-capacity (v/c) or pass/fail tests, the *Highway Capacity Manual* is the most widely accepted methodology for measuring roadway LOS.⁶ The *Highway Capacity Manual*’s rating system ranges from “A” (least congested) to “F” (most congested). These ratings are typically applied to roadway facilities such as signalized intersections, unsignalized intersections, two-lane highways, multi-lane highways, roundabouts, and urban streets. The ratings are based on

vehicle delay, density in passenger cars per mile per lane (pc/mi/ln), average speeds, v/c, and service flow rates in passenger cars per hour per lane (pc/hr/ln).⁷ Computer modelling is typically needed for state of the art traffic impact studies, with manual computations rare and not recommended by the engineering profession.⁸

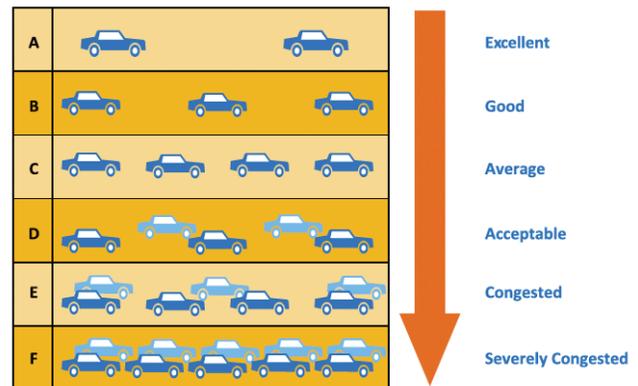
A trend has emerged to expand LOS analyses to facilities other than roads, such as transit, pedestrian and bicycle facilities. In some communities, the LOS concept includes multiple travel modes (“multimodal” analysis) and a consideration of quality of service (QOS) rather than the conventional capacity- or delay-based models that apply to motor vehicles. This is driven by environmental, quality of life, placemaking, and fiscal objectives – along with physical constraints on the ability to expand road capacity.⁹ Methodologies for multimodal analysis are not as well developed as those for road facilities, and congestion and capacity issues are typically not significant for transit, pedestrian and bicycle facilities.¹⁰ Therefore, communities in states such as Florida, North Carolina, Oregon and Washington have started to allow alternative travel modes as substitutes for roadway capacity for concurrency compliance or traffic studies. Communities and state concurrency laws have also exempted development in highly urban, transit-supportive locations where road capacity improvements would be detrimental to community character.¹¹

As a result of the LOS standards, difficulties might occur if existing public facilities are determined insufficient to accommodate the impacts of a proposed development. Where that is the case, a concurrency system can present the following options:

- (1) permits may be deferred pending the availability of public facilities and services at the adopted LOS,
- (2) the applicant may agree to reduce the density or intensity of the proposed development within the parameters of available facility capacity,
- (3) the developer may agree to provide the transportation facilities needed (or a payment to construct these facilities) to attain the adopted LOS, or
- (4) the developer and service provider can find ways to free up capacity by making the transportation network operate more efficiently, such as through the use

of signalization or alternate transportation modes. As with option (3), this can involve the construction of additional transportation improvements (such as adding signals) and should involve a commitment by the service provider to construction and ongoing maintenance of the improvement.

These options illustrate the difference between a concurrency system and a fee payment system, such as impact fees. With concurrency, the applicant studies the transportation network, and is given multiple ways to comply. These include delaying development impacts (such as by phasing development), reducing development impacts, or mitigating those impacts by providing the facilities. The permitting authority usually has discretion to apply conditions, and to accept or reject conditions depending on administrative capacity, constraints on facility expansion, or related factors. With impact fees, applicants only have one option – i.e., to pay a fee that is earmarked to transportation improvements. Some communities and at least one statewide transportation concurrency framework (Florida) have modified transportation concurrency compliance to allow developers to pay fees toward transportation facilities. Developers sometimes prefer the fee payment option because it is less complicated than traffic studies, and results in quicker approvals than those involving a detailed



Source: Washington County (Oregon) Transportation System Plan User Guide (Effective November 27, 2015)

transportation study.

Purpose and Advantages of Level of Service (LOS) Metrics

Concurrency and TIS requirements provide a number of community benefits. These relate directly to the tool's principal purpose – i.e., controlling congestion – but also have administrative and policy advantages over traditional zoning and subdivision controls. These include:

- **Direct Control over Timing and Volume of Traffic Impacts.** A LOS metric ensures that growth demands do not exceed transportation capacity. This is because the traffic impact study directly measures the impacts of a development based on its use, location, and transportation facilities within the analysis area. By comparison, traditional zoning indirectly controls development impacts through use, density, and maximum floor area. However, these are not typically related directly to the surrounding transportation network, and do not control the timing of development. A modern LOS metric and TIS requirement, such as those administered by New Castle County, directly (although not perfectly) measures the impacts of a proposed development along with the transportation capacity affected by it.
- **Provides a Predictable Standard for Development.** Even without concurrency, traffic congestion is often an issue with discretionary land-use approvals such as rezonings and subdivision plats. Concurrency provides a systematic, measurable alternative to ad hoc rezoning or subdivision plat denials or conditions predicated on congestion levels that are unacceptable to the surrounding neighborhood for the current decision-makers. This is because the LOS metric defines the boundary between what is considered acceptable and unacceptable to the community, and that boundary can be measured and mitigated in advance of the actual land-use decision.
- **Flexibility.** Concurrency provides a range of compliance options, including density reduction, provision of transportation improvements, and development phasing. By contrast, conventional zoning allows only density or floor area reductions is a way to reduce impacts where congestion is present. With concurrency, a community can increase density or floor area potential on a site, while phasing in development commensurate with the availability of existing and future transportation capacity enhancements. Impact fees also offer a way to mitigate development by allowing it to pay for transportation improvements that are proportionate to actual development impacts. However, it only allows monetary payments as a compliance

alternative. Developers do not have the option to phase development so that it occurs only when future improvements are made, or of reducing fee payments by improving development efficiencies (of course, some modern impact and mobility fee take these factors into consideration). A concurrency system provides a wide range of options to either reduce demands on the transportation network, increase network capacity, or a combination of both.

- **Overall Planning.** A concurrency regulation is part of an overall planning process that coordinates development patterns with future capital improvements. By continuously studying the transportation network, a concurrency system “red-flags” needed transportation improvements so that they can be allocated to locations where transportation demands and impacts are most needed.

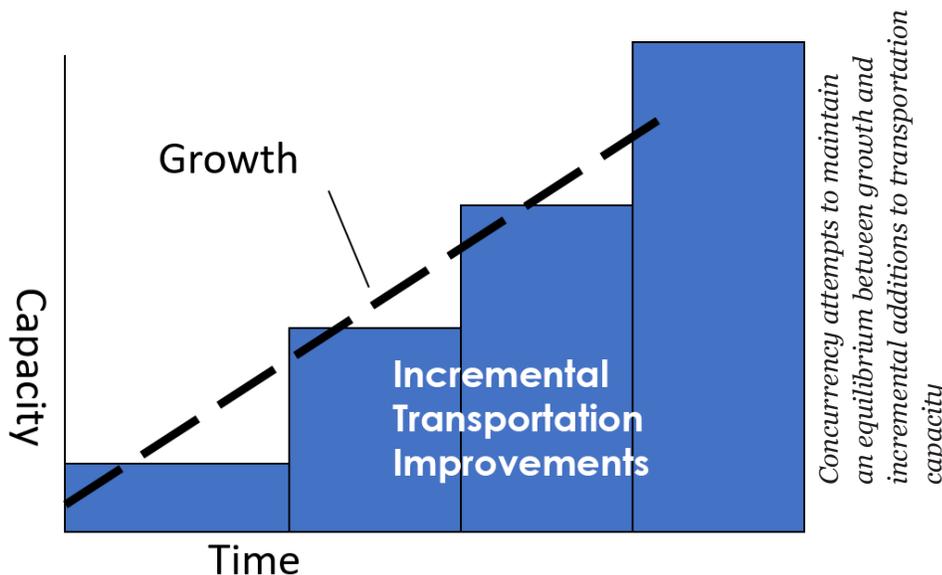
Potential Disadvantages of LOS Metrics

- **Priorities.** A concurrency system can effectively prioritize transportation over other County policies, such as economic development or place-making. As is discussed with regard to affordable housing and economic development below, denying or conditioning development based on its impact on traffic raises an implicit policy choice – i.e., that traffic congestion is more important than housing or economic development. While transportation is important to economic development, quality of life, and mobility, this raises an important policy choice for New Castle County.
- **Effect on Countywide or Regional Development Patterns.** Concurrency can be sprawl-inducing, encouraging lower-density development patterns serviceable only by roads. The TIS typically measures only localized impacts (for example, New Castle County does not count any more than three intersections away from my proposed development). This can ignore impacts on the wider transportation network. By limiting development in places with current congestion issues, concurrency can encourage new development in undeveloped, uncongested locations.¹² While this is, in a sense, the fundamental purpose of measuring and applying an LOS metric, it can have the effect of encouraging sprawling development patterns. This has the perverse effect of introducing congestion to uncongested (such as rural or agricultural) locations, spreading transportation impacts over wider areas and reducing access to transit or pedestrian accessible locations that can (at least partially) reduce demands for

vehicle trips. Communities such as New Castle County offset this unintended consequence by applying lower LOS standards (i.e. allowing more congestion) in more urban locations, such as areas with current central sewer service. However, the presence of an LOS metric can still lower development potential in places where a full range of infrastructure is already available.

- **Administrative Burdens.** Concurrency creates administrative burdens for tracking and allocating capacity. The TIS can be time-consuming and expensive for both applicants and county staff. While the LOS metric provides a measurable standard for development, there are also opportunities for disagreement and delay with the Department of Land Use, DelDOT, and the applicant as to whether and how to mitigate transportation impacts.
- **Can Limit Supply and Increase Cost of Housing.** Where development potential is reduced or delayed to reduce transportation impacts, this can limit housing supply and (assuming maintained or increased market demands) increased housing cost. In addition, mitigation is an expense for new development that could be passed on to renters and homeowners. Of course, if the county wants to maintain a given LOS these costs will need to be borne somehow – either through upfront contributions by developers, or as an ongoing general fund, gas tax, or bond repayment by the general public.

- **Economic Development.** During the process of updating the UDC, we consistently heard from the development community about the impact of LOS standards on economic growth. Applications for projects that would bring employment to the County could be denied, or face increased costs, to avoid reductions in the adopted LOS. This presents the county with an important policy decision – i.e., whether reducing or avoiding traffic congestion is more important than creating jobs (or at least those jobs within the county’s preferred economic sectors). We were also told by some participants in the UDC update that delays or increased development costs have created an impression that New Castle County is a difficult place to do business. While we have not been able to empirically verify these anecdotes, it is always a best practice to streamline processes and to eliminate unnecessary delays or costs in the development approval process.
- **Measurement Flaws.** No TIS can ever perfectly measure the future demands on a surrounding roadway network created by a proposed development. This is because changing demographics, commuting choices, transportation alternatives (such as autonomous vehicles), and related factors can increase or decrease the actual impact on affected transportation facilities. In the other hand, the art and science of measuring development impacts has improved significantly since the advent of travel demand forecasting, and now embraces multiple transportation modes.



Current LOS Program

County Program (UDC Art. 11)

New Castle County establishes a “concurrency” requirement for development. This refers to a requirement that development is served with adequate public facilities, as measured by standards established in the County’s Unified Development Code (UDC) or state law (UDC Division 40.05.000, 40.05.500). The County requires concurrency for the following facilities:

- Water and sewer (Article 12)
- Transportation (Article 11)
- Drainage (Article 22, § 40.22.210)
- Schools (Division 40.05.000 and 40.05.200, and state law [9 Del. C. § 2661 (c)(1)])
- Library, emergency medical, fire, parks and police services through payment of an impact fee (Article 14).

In practice, transportation capacity tends to provide the main limiting factor for development approval. Rezoning and major land development permits are not approved if they would degrade the adopted transportation level of service (LOS) standards, as determined by a traffic impact study (TIS) (UDC Division 40.11.000). Transportation capacity is allocated on a first-come, first-served basis (UDC Division 40.11.000).

A TIS scoping meeting occurs at the exploratory plan stage, and the TIS and concurrency requirements must be met before a record plan is submitted (UDC § 40.31.113.C2). The TIS must evaluate available roadway capacity, taking into consideration “recorded plans, major plans and plans with rezonings not initiated by the County that have, exploratory plan approval, [and] projects having had a zoning change approved within a three (3) year prior period” (UDC § 40.11.130.A.7). The applicant cannot proceed to the record plan phase until the Department of Land Use (DLU) approves the TIS.

Because a TIS must consider existing approvals, those

approvals can tie up available transportation capacity. In practice, this can occur indefinitely. The UDC currently establishes a 5-years sunset period for a subdivision or land development plan (UDC § 40.01.130.A). If construction does not commence during that time, the County may reapprove the plan, disapprove the plan, or (for a rezoning approval) revert the parcels to their prior zoning classification (UDC § 40.01.130.D). In practice, the County tends to reapprove plans, and the sunset provisions are not clear about how the County is to track the unused capacity of expired plans. This means that, if the LOS is underperforming due to existing approvals, new applications affecting the roadways are held up. This has raised the issue of how – and how long – to reserve capacity that was counted as part of a TIS.

If the LOS is unacceptable, development cannot proceed unless an applicant either obtains a LOS waiver or enters into agreements to mitigate the adverse traffic effects.¹³

The UDC defines LOS as follows, using the *Highway Capacity Manual* as a guide:

“Level of service (LOS). A measure of traffic on a roadway segment or intersection being used during peak hours, as determined by the most current version of report 209, the Highway Capacity Manual, prepared by the National Research Council’s Transportation Research Board. Level of service is expressed on a scale of “A” to “F” with “A” indicating the best level of service and “F” indicating the worst. The definitions of levels of service “A” through “F” shall be those contained in the references cited in this definition.”

New Castle County’s LOS metric for transportation is bifurcated, based on whether a project is located in a sewer service area:

Table 1 Transportation LOS Standard (UDC § 40.11.200)

	Location	LOS
Sewer Service Areas	Generally	“D”
	Sewered, Existing Developed Area or Designated Infill Area	“E” for roadway segments and intersections currently at “E” “D” for transportation and/or transit projects if: <ul style="list-style-type: none"> • They are currently under construction, or • Contracts for construction are awarded by DelDOT to ensure completion.
Outside Sewer Service Areas		“C”

Note that the terms “Existing Developed Area” or “Designated Infill Area” are not defined. Therefore, it is unclear from the face of the UDC where LOS “E” currently applies.

The UDC includes an LOS waiver process for redevelopment projects in § 40.08.130(B)(6)(e)(7). This section allows – but does not require – the County or DelDOT to require a TIS for certain redevelopment projects. DelDOT may recommend development restrictions or transportation improvements, but the County is not obligated to enforce the DelDOT regulations.¹⁴ This section contains alternative LOS standards, prohibiting a reduction from A, B, C or D to E or F, or from E to F. This section has been the topic of several court decisions, and has been criticized by many participants in the UDC update process.

The UDC’s concurrency standards recognize the availability of planned improvements. The TIS must include planned traffic mitigation programs and transportation improvements such as:

- projects awarded or under construction,
- projects in DelDOT’s six (6) year capital improvements program (the “DelDOT CIP”) (currently referred to as the “Capital Transportation Program” or “CTP”),¹⁵ including completion dates, and
- projects and corridor needs in the adopted Wilmington Area Planning Council (WILMAPCO) Metropolitan Transportation Plan.¹⁶

Developers may mitigate by phasing construction to coincide with the completion of programmed transportation construction projects identified in DelDOT’s CIP (UDC § 40.11.220.A.2). Zoning changes are allowed only if a needed mitigation project is

part of the current year’s capital budget (UDC § 40.11.220.B). The impact of improvements in the DelDOT CIP on the attainment of acceptable LOS is considered in approving LOS Waivers and associated Traffic Mitigation (TM) agreements (UDC § 40.11.230.C.2.c).

Delaware Department of Transportation (DelDOT) Review and State Law

While the County makes the ultimate decision as whether development meets the LOS standards in UDC Article 11,¹⁷ the Delaware Department of Transportation (DelDOT) plays a significant role in reviewing applications. DelDOT reviews traffic information submitted with all major plans and rezonings to determine whether TIS is required,¹⁸ and maintains regulations for the review of private development (the “DelDOT Regulations”).¹⁹ The DelDOT Regulations define LOS as:

“A term used for indicating whether traffic is moving at ideal, average or poor conditions, measured on a scale from “A” to “F”.”²⁰

The table below shows the LOS rating for uninterrupted flow facilities (such as highways) from the DelDOT Regulations, which refer to the 2000 *Highway Capacity Manual*. LOS ratings are also established for signalized intersections, roundabouts, unsignalized intersections, weaving areas, and ramps.²¹

Table 2 LOS for Two-Lane and Multi-Lane Highways (DelDOT & Highway Capacity Manual 2000)

Criteria		A	B	C	D	E
Two-Lane Highways						
Percent Time Spent Following		< 35	> 35-50	> 50-65	> 65-80	> 80
Average Travel Speed (mi/h)		> 55	> 50-55	> 45-50	> 40-45	≤ 40
Multi-Lane Highways						
Free-Flow Speed						
60 mi/h	Maximum Density (pc/mi/ln)	11	18	26	35	40
	Average Speed (mi/h)	60	60	59.4	56.7	55
	Maximum volume-to-capacity ratio (v/c)	0.3	0.49	0.7	0.9	1
	Maximum service flow rate (pc/h/ln)	660	1080	1550	1980	2200
55 mi/h	Maximum Density (pc/mi/ln)	11	18	26	35	41
	Average Speed (mi/h)	55	55	54.9	52.9	51.2
	Maximum volume-to-capacity ratio (v/c)	0.29	0.47	0.68	0.88	1
	Maximum service flow rate (pc/h/ln)	600	990	1430	1850	2100
50 mi/h	Maximum Density (pc/mi/ln)	11	18	26	35	43
	Average Speed (mi/h)	50	50	50	48.9	47.5
	Maximum volume-to-capacity ratio (v/c)	0.28	0.45	0.65	0.86	1
	Maximum service flow rate (pc/h/ln)	550	900	1300	1710	2000
45 mi/h	Maximum Density (pc/mi/ln)	11	18	26	35	45
	Average Speed (mi/h)	45	45	45	44.4	42.2
	Maximum volume-to-capacity ratio (v/c)	0.26	0.43	0.62	0.82	1
	Maximum service flow rate (pc/h/ln)	490	810	1170	1550	1900

State law requires the County and DelDOT to develop a process to determine the traffic impacts of rezonings (9 Del. C. § 2662). The statute requires the agreement to apply “nationally recognized traffic criteria” and to “consider the effects of existing traffic, projected traffic growth in areas surrounding a proposed zoning reclassification, and the projected traffic generated by the proposed site development ...” The County and DelDOT entered into an agreement in 1990 (apparently replaced in 2008), establishing LOS D as a benchmark for evaluation.²² This statute is limited to rezonings (i.e., a change in the zoning classification of a property) but not to other types of land use decisions.²³

The 2008 Memorandum of Understanding (“MOU”) between DelDOT, New Castle County and WILMAPCO recognizes the County’s authority to administer land development approvals and the LOS established in the UDC.²⁴ Major land development and rezonings are subject to TIS requirements, and TIS review thresholds based on vehicles per day (“vpd”) and vehicles per hour (“vph”) generated by a development, as follows:

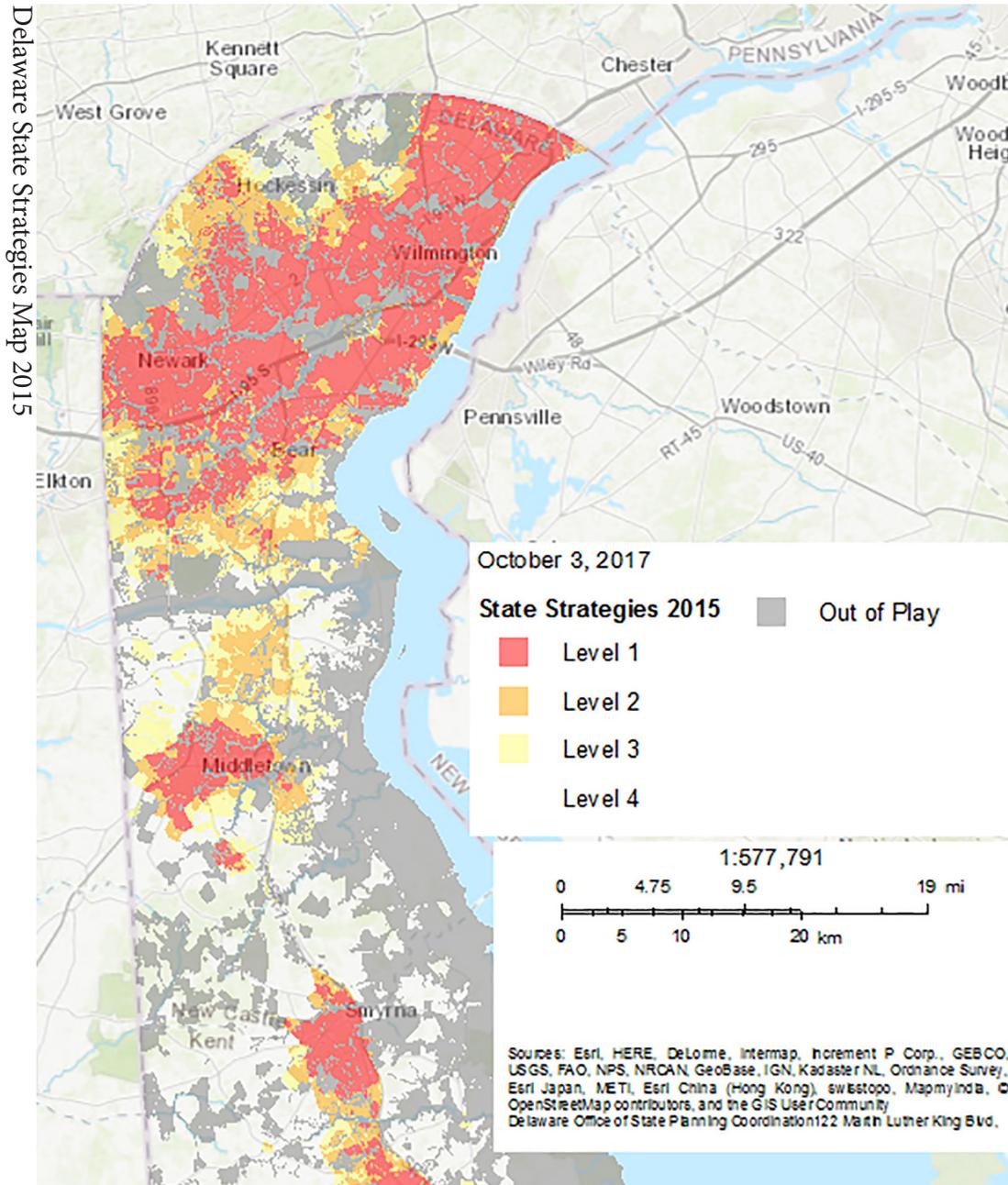
Table 3 DelDOT-County MOU Review Thresholds

VPD	VPH	Exceptions
> 2,000 or	> 200	Located in TID and within subregional plan type and intensity
Between 400 - 2,000	Between 50-200	Located in TID and within subregional plan type and intensity Other exemptions established by County for redevelopment, workforce housing, economic development, etc. subject to fee contributions

The DelDOT Regulations (§ 2.1) recognize the Highway Capacity Manual as the basis for TIS review. DelDOT typically communicates its recommendations on a TIS through a Letter of No Objection (“LNO”) (DelDOT Regulations § 2.1).

DelDOT allows smaller developments (less than 2,000 vpd and 200 vph) to pay a fee (\$10 per daily trip) for an Area-Wide Study (DelDOT Regulations § 2.3.2). The study is performed by DelDOT, and the applicant funds or constructs its share of off-site improvements identified in the study.

A Transportation Improvement District (TID) is a tool that enables or requires applicants to pay a fee in lieu of submitting a TIS (DelDOT Regulations § 2.3.4, 2.13). A Land Use and Transportation Plan (LUTP) provides the planning basis for a TID, with contributions toward transportation improvements identified in a TID agreement. New Castle County has several locations (Churchman’s Crossing area and the Route 40 Corridor) that have involved the level of study associated with a TID, but do not have an intergovernmental agreement or a fee.²⁵



Comprehensive planning designations such as the Strategies for State Planning and Spending Investment Areas and New Castle County’s Guiding Principles can provide a foundation for designating Transportation Improvement Districts

Peer Communities

Communities in other parts of the United States have struggled in various ways with the traffic impacts of new development. Two states (Florida and Washington) have concurrency requirements in state law, while Maryland expressly authorizes the tool in its land use enabling legislation. Some states, such as California, Georgia and Oregon, have statewide planning or growth management statutes that embrace concurrency as an implementation tool.

This section of the White Paper explores the concurrency and LOS requirements in 4 similar communities: Orange County, Florida; Pierce County, Washington; Washington County, Oregon; and Anne Arundel County, Maryland. Each County has similar population and land area and similar regional settings, with large central cities nearby or within the County.

Three of the counties are similar in population (Washington County, OR; Pierce County, WA; and Anne Arundel County, MD), two in population density (Orange County, FL; Anne Arundel County), and two in land area (Washington and Anne Arundel Counties). Only one of the selected counties hosts the region’s largest central city (Orange County – Orlando). The others (like New Castle County with Philadelphia) are adjacent to the counties that host the region’s central city (Pierce County – Seattle, Washington County – Portland, and Anne Arundel County – Baltimore).

Three of the counties are in states with mandatory concurrency (Florida, Oregon and Washington) and one where concurrency is an optional component of an overall growth management system (Maryland). Florida, Oregon and Washington have long experience with concurrency, and have studied and implemented ways to balance concurrency with related public policies such as infill, design, and housing.

Table 4 LOS Peer Counties

Jurisdiction	Pop.	Housing Area in square miles			Density per square mile of land area			
		units	Total area	Water area	Land area	Pop.	Housing units	
New Castle County	DE	538,479	217,511	494	67.72	426.29	1,263.20	510.2
Orange County	FL	1,145,956	487,839	1,003.26	99.83	903.43	1,268.50	540
Pierce County	WA	795,225	325,375	1,806.44	136.93	1,669.51	476.3	194.9
Washington County	OR	529,710	212,450	726.42	2.19	724.23	731.4	293.3
Anne Arundel County	MD	537,656	212,562	587.8	172.9	414.9	1,295.90	512.3

Note: communities in orange shading are in states with mandatory concurrency, those in blue shading are in states where concurrency is optional

Orange County, Florida

Codification: Concurrency Management Ordinance (Chapter 30, Article XII, Orange County Code) (“CMO”)

Facilities: Roads, Mass Transit

Description: Concurrency for roads and transit is required and based on the LOS established in the Comprehensive Plan and the CMO. Transportation concurrency was formerly required by state law, but is now optional for local governments.²⁶ Professionally accepted techniques for measuring levels of service are required, and applicants may pay their proportionate share toward facilities in lieu of awaiting their availability. Local governments may replace transportation concurrency with a mobility funding system using the tools and techniques identified in the table below. Local governments with transportation concurrency are encouraged to address the potential negative impacts of concurrency, or to complement concurrency, using the following tools:

Table 5 Florida Techniques to Mitigate or Supplement Concurrency Regulations

Address potential negative impacts on future development:	Tools that complement the application of transportation concurrency:
<ul style="list-style-type: none"> • In urban infill and redevelopment, • In urban service areas. • With special part-time demands on the transportation system. • With de minimis impacts. • On community desired types of development, such as redevelopment, or job creation projects. 	<ul style="list-style-type: none"> • Adoption of long-term strategies to facilitate development patterns that support multimodal solutions, including urban design, and appropriate land use mixes, including intensity and density. • Adoption of an areawide level of service not dependent on any single road segment function. • Exempting or discounting impacts of locally desired development, such as development in urban areas, redevelopment, job creation, and mixed use on the transportation system. • Assigning secondary priority to vehicle mobility and primary priority to ensuring a safe, comfortable, and attractive pedestrian environment, with convenient interconnection to transit. • Establishing multimodal level of service standards that rely primarily on non-vehicular modes of transportation where existing or planned community design will provide an adequate level of mobility. • Reducing impact fees or local access fees to promote development within urban areas, multimodal transportation districts, and a balance of mixed-use development in certain areas or districts, or for affordable or workforce housing.

Measurement: LOS is identified in the Comprehensive Plan’s Transportation Element and the concurrency ordinance.²⁷

- **Mass Transit.** Development permits are not issued if total weekday transit capacity drops below 73,500 person trips per day. This number is equal to 75% of the mass transit person trips that are available.²⁸ This is determined by evaluating the primary service provider’s bus inventory.²⁹ Includes services provided by the central Florida Regional Transportation Authority (LYNX and the International Drive Master Transit and Improvement District (IDMTID)). Includes traditional fixed-route bus service, paratransit, trolley, bus rapid transit (LYMMO), and commuter rail (SunRail).
- **Roadways.** Varies by system type (see below)

Table 6 Orange County Roadway LOS

Type	State and County			
	Rural	Urban Non-SIS and Non-TRIP	SIS Facilities	TRIP Funded Facilities
Principal Arterial, Urban (Class I)	N/A	E	E	E
Principal Arterial, Urban (Class II)	N/A	E	E	E
Principal Arterial, Rural	D	N/A	N/A	N/A
Minor Arterial, Urban	N/A	E	E	E
Minor Arterial, Rural	D	N/A	N/A	N/A
Collector, Major and Minor Urban	N/A	E	E	E
Collector, Rural	D	N/A	N/A	N/A

Source: Comprehensive Plan, Policy T2.1.1 & Orange County Code § 30-520. TRIP (Transportation Regional Incentive Program fund for regional facilities) and SIS (Strategic Intermodal System) are regional facilities.³⁰

In addition to roads, the County establishes Transportation Quality/Level of Service standards for transit, bicycle, and pedestrian facilities and roadways within a Multimodal Transportation Network (MMTN), computed as provided in the Transit Capacity and Quality of Service Manual, as shown in the table below.³¹ Developers can contribute to the multimodal network through improvements to enhancements such as shaded sidewalks, benches and enhanced crossings; direct connections between the MMTN and the regional bicycle/ pedestrian network; shared use paths; passenger transfers at transit facilities; preferential parking for rideshare; motor vehicle passenger drop-offs and pick-ups at transit facilities and commercial and office development sites; accommodations for car sharing, bike sharing, and electric cars; and weather protection at transit stops.³²

Table 7 Orange County Transportation Quality/Level of Service

	Pedestrian	Transit	Bicycle	Automobile
Transit-oriented	C	C	D	E *
Bicycle/Pedestrian-oriented	C	D	C	E *

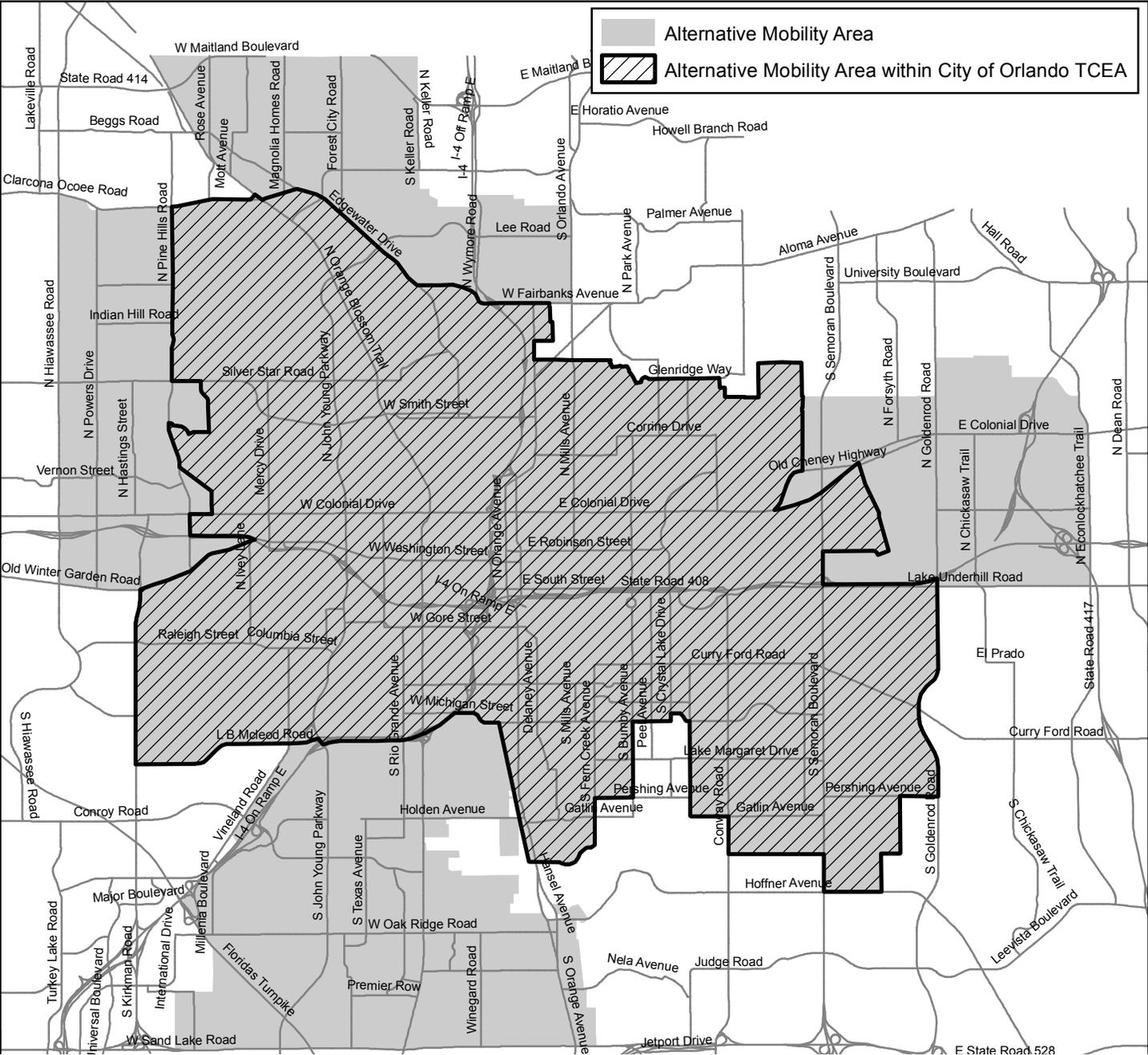
*Automobile LOS shall be periodically reviewed as the transit network and other non-motorized transportation improvements are implemented.

For roads, the area of influence for evaluating concurrency is a 1 mile radius of the project for urban areas and 2 1/2 miles for rural areas.³³ Concurrency analysis uses manuals unique to Florida, including the Florida Department of Transportation (FDOT) *Quality Level of Service Manual*. Applicants for development approval receive a capacity encumbrance letter or, on paying a fee, a capacity reservation certificate. Capacity reservation certificates reserve transportation capacity for a period of up to three years. Pursuant to state law, if the county determines that transportation capacity is insufficient for the proposed development, the applicant may enter into a binding agreement to pay for or construct its proportionate share of required improvements (“proportionate share agreement”).³⁴

Locational Standards:

The Comprehensive Plan identifies Alternative Mobility Areas (AMA) to promote urban infill development and redevelopment (see Figure 2 below).³⁵ These are a form of Transportation Concurrency Exception Areas (TCEA’s) under Florida law, which allows local governments to designate urban areas as exempt from concurrency re-

Figure 2 Orange County Alternative Mobility Area



See <http://www.orangecountyfl.net/Portals/o/Library/Traffic-Transportation/docs/Alternative%20Mobility%20Area.pdf>

quirements. As of August 31, 2009, projects located within the AMA are not required to meet roadway concurrency requirements. Projects generating at least 10 ADT are subject to mobility standards that vary by a development’s trip generation and proportional impact on roadway facilities. AMAs may expand depending on public transit needs and future development trends. Performance measures in an AMA include:

Mobility Strategy	Measure	Target and Timeline
Support alternative modes of transportation	Transit shelters in the AMA	Increase number of bus shelters
	Sidewalk coverage near transit stops in the AMA	Increase percentage of roadways within ¼ mile of transit stops with sidewalks (at least one side)
	Pedestrian, bicycle and transit Q/LOS	Achieve grade C or better
	VMT in the AMA (per capita)	Maintain or reduce amount
	Accidents involving pedestrians and bicyclists in the AMA	Reduce annual number of accidents involving pedestrians and bicyclists in the AMA.
Transportation network connectivity	Pedestrian connectivity index	Increase pedestrian connectivity index score by measuring link to node ratio.

Type Standards: A “project that promotes public transportation” (PPPT) is exempt from concurrency.³⁶ These include transit facilities, office buildings or projects that include fixed-rail or transit terminals as part of the building, and projects which are transit-oriented and designed to complement reasonably proximate planned or existing public facilities.³⁷ This requires a mobility analysis, and may be approved for part of a development.

Economic Development: No special provisions are included.

Affordable Housing: The Orange County comprehensive plan calls for the County to study the effects of concurrency on affordable housing. The calculation of reservation fees credits all impact fees for affordable housing toward the reservation fee, and the City of Orlando has a 3% set-aside of trip capacity reserved in each traffic zone as committed capacity for affordable housing.³⁸ Capacity reservation fees are calculated by subtracting impact fee credits and proportionate share contributions from the applicable transportation impact fees. Projects may also subtract the transportation impact fees due for the affordable housing units in the project.³⁹

Pierce County, Washington

Codification: Pierce County Code § 17B.20.060 (Traffic Impact Analysis Requirements) Title 18 (Development Regulations), Title 19 (Comprehensive Plan), and Chapter 4A (Traffic Impact Fees)

Facilities: Concurrency applies to:

- “Category A Public Facilities” owned or operated by Pierce County, including County arterials, and
- “Category B Public Facilities” owned or operated by federal, state, or city governments, independent districts, and private organizations, including transit.

Description: The concurrency management system implements transportation concurrency as required by state law. The County adopts a LOS for four categories of public facilities, with Categories A and B subject to concurrency. State regulations define “concurrency” to mean “. . . that adequate public facilities are available when the impacts of development occur.”⁴⁰ State law provides a 6-year window for planned capital improvements, and facilities are considered “concurrent” with development if “improvements or strategies are in place at the time of development, or that a financial commitment is in place to complete the improvements or strategies within six years.”⁴¹ Roads and transit must: (1) be in place at the time of development (or include a financial commitment to provide the facilities within a specified period of time), and (2) have sufficient capacity to serve development without decreasing LOS below minimum standards adopted in the CFP.⁴²

The Development Regulations include a number of definitions germane to concurrency (i.e., assigned service area, Category A and B public facilities, certificate of concurrency, concurrency management system, level of service standard and level of service, and test for concurrency) but none of those definitions are used in the body of the ordinance.⁴³ The Development Regulations do not include any process for determining compliance with concurrency. The few mentions of concurrency in the regulations indicate that it applies to conditional use permits,⁴⁴ and infrastructure and public facilities and services plans and final project master plans for planned unit developments (PUDs).⁴⁵

In addition to the concurrency management system, applicants are subject to transportation impact fees and traffic impact analysis (TIA) review. A TIA is required for projects that generate 25 or more peak-hour trips, but is not expressly tied to the concurrency requirements. Traffic Impact Fees are charged for residential and non-residential development, and vary over 11 different transportation service areas.

Measurement: The Development Regulations define “level of service” as:

“...an established minimum capacity for public facilities or services that is planned to be provided per unit demand or other appropriate measure of need and is used as a gauge for measuring the quality of service. Levels of service are usually quantifiable measures of the amount of public facilities that are provided to the community. Levels of service may also measure the quality of some public facilities. Levels of service should be set to reflect realistic expectations consistent with the achievement of growth aims. Levels of service standards are valuable planning and budgetary tools, even if concurrency is not required for specified facilities, given that they are a measure of quality of service.”⁴⁶

For roads, the Comprehensive Plan has established a concurrency LOS using traffic volumes (V), service thresholds (S), and V/S Service Standards. The Capital Facili-

ties Plan describes V/S thresholds and identifies roadway locations where they are exceeded in the current year and future 6 year period.⁴⁷ The Comprehensive Plan requires the County to consider an “ultimate capacity” concept for roads that cannot meet concurrency LOS, but that may trigger operational safety and nonmotorized improvements or Transportation Demand Management (TDM) (Policy T-25.3), and to tailor concurrency to transit-oriented development (Goal T-27). The LOS for arterials is based on an average volume to service threshold (V/S) ratio based on the number of travel lanes:⁴⁸

Table 8 Pierce County Arterial LOS (from Pierce County Comprehensive Plan)

	Travel Lanes (both directions)	Without Turn Channelization ⁴	With Turn Channelization ⁴
Urban	2	17,600	22,000
	3	24,600	30,800
	4	35,200	44,000
	6	49,300	61,600
Rural	2	15,800	19,800
	4	31,600	39,600

Service Threshold was defined by Annualized Average Daily Traffic (AADT).

1. Urban Classifications include arterials with Federal Urban Arterial status and/or within the County’s Urban Growth Area.
2. Rural Classifications include arterials that are not classified as Urban per the above definition.
3. Turn Channelization consists of a roadway having a center two-way left turn lane or exclusive turn pockets at key locations.
4. Three-lane thresholds pertain to uneven 3-lane arterials, which have one lane in one direction and two lanes in the other. Assumes 60% of a 2-lane capacity is in the direction with one lane (e.g. $0.6 * 17,600 = 10,560$), plus 40% of a 4-lane capacity in the direction with two lanes (e.g. $0.4 * 35,200 = 14,080$). Example total = $10,560 + 14,080 = 24,640$ or 24,600. If turn channelization is present, the Service Threshold increases to 30,800.
5. An additional capacity Service Threshold of 47,400 was derived for 4-lane arterials possessing access control. This capacity is applied to 176th St E after completion of capacity improvement.
6. Details of the methods used to create Service Thresholds can be found in the Pierce County Traffic Impact Fee Rate Study and the Technical Memorandum #3 of the Pierce County Traffic Impact Fee Notebook (September 30, 2005)

Source: Adapted from Florida DOT, ART-TAB software, Level of Service Handbook (1998).

The County originally used a congestion measurement system that averaged congestion on parallel facilities crossing a set of “screenlines.” The V/S metric is thought to provide a more realistic way to present congestion.⁴⁹

Locational Standards:

The V/C ratios vary by urban and rural locations. A 2008 White Paper presented the transportation impacts of various growth alternatives, such as mixed use centers. However, these did not appear to recommend or result in any targeted changes to concurrency standards.⁵⁰

Type Standards:

The Pierce County system does not appear to adjust concurrency for any particular development types, or to encourage placemaking.

Economic Development:

No special provisions are included.

Affordable Housing:

No special provisions are included.

Washington County, Oregon

Codification: Washington County Community Development Code § 501 (Public Facility and Service Requirements)

Facilities: Roadway, transit and multimodal facilities

Description: Oregon’s growth management legislation is notable for establishing statewide comprehensive planning goals and for directing growth to urban growth boundaries (UGBs). The State’s Transportation Planning Rule (TPR) essentially requires concurrency review for rezonings, and was recently amended to address compact development, economic development, and multimodal analyses.⁵¹

Washington County’s Development Code requires a package of public improvements for subdivisions, new construction or expansion generating more than 14 ADT, changes in use, and off-street parking.⁵² The improvements are divided into three categories: Critical, Essential, and Desirable:⁵³

Critical Services Public water, public sewer, fire protection, drainage and access on Local and Neighborhood Route roads.

Essential Services Schools, Arterial (including State highways) and Collector roads, Regional Trails identified on the Transportation System Plan Pedestrian System map, transit improvements, police protection, street lighting and on-site pedestrian and bicycle facilities in the public right-of-way

Desirable Services Public transportation service, parks, traffic calming devices, mid-block crossings, Community Trails identified on the Transportation System Plan Pedestrian System Map, Special Area Trails, Pedestrian Connectivity Areas identified on the Community Plans and off-site pedestrian and bicycle facilities

Most of the LOS requirements simply require access, some level of design, or reservation or dedication of easements or improvements. Adequacy of arterial and collector roads is fulfilled through payment of a Transportation Development Tax (other than for drainage, safety, and related elements that do not relate to capacity). For transit improvements, the Transit District determines whether bus stops are adequate.⁵⁴ The LOS refers to the Transportation System Plan standards, and the definitions refer to analysis of roads that “impact and benefit” a project (including intersections where the development generates 10% of ADT, and where existing and approved development cause facilities to operate below LOS “E” for more than 20 minutes during the peak hour and the project’s traffic is at least 5% of that traffic).⁵⁵ However, the LOS standards do not result in phasing, reduced development impacts, or mitigation other than payment of the Transportation Development Tax.

Measurement: The Transportation System Plan adopts the following standards (in effect until Metro – the regional planning agency – issues a revision to the policy):⁵⁶

Table 9 Interim Washington County Motor Vehicle Performance Measures

Maximum Volume to Capacity (V/C) Ratio Standards				
AM/PM Peak Two-hour Period				
Location²	Target¹		Acceptable¹	
	Performance Measures³		Performance Measures³	
	First Hour⁴	Second Hour⁴	First Hour⁴	Second Hour⁴
Regional Centers				
Town Centers	.99	.9	.99	.99
Main Streets	(E)	(D)	(E)	(E)
Station Communities				
Other Urban Areas				
	.9	.9	.99	.9
	(D)	(D)	(E)	(D)
Rural Areas				
	.9	.9	.9	.9
	(D)	(D)	(D)	(D)

¹ For development review purposes, these performance standards will be used in assessing safety improvements. For plan amendment purposes, if a plan amendment is predicted to exceed the acceptable performance standard, the performance on applicable facilities will not be allowed to deteriorate further, and mitigation may be necessary. For project development purposes, these performance standards will be used to evaluate conditions beyond the transportation plan’s planning horizon, as appropriate.

² For location reference see 2040 Growth Concept Design Types Map.

³ Vehicle performance shall be determined by using volume-to-capacity ratios. Volume-to-Capacity equivalencies to Level of Service (LOS) are as follows: LOS C = V/C of 0.8 or lower; LOS D = V/C of 0.81 to 0.9; LOS E = V/C of 0.91 to 0.99. Further discussion of vehicle performance is provided in the Technical Appendix.

⁴ First Hour is defined as the highest hour of the day. Second hour is defined as the hour following the first hour.

Locational Standards:

The adopted LOS bifurcates the most intensely developed urban areas and rural areas.

Type Standards:

The amended TPR allows the designation of multimodal mixed-use areas (MMA) where traffic congestion is not reviewed for rezoning. The MMAs must be located in a UGB and include a mix of uses, pedestrian and transit oriented building and site design standards, and limits on low intensity uses. In the Development Code, proposed non-residential or mixed-use development exceeding the FAR standard must demonstrate that the transportation system has adequate planned capacity to accommodate additional site-generated traffic, consistent with the County’s adopted LOS.⁵⁷

Economic Development:

The revised TPR allows the partial mitigation of traffic where industrial or traded-sector (i.e., firms that sell goods or services into national or international markets) jobs are created or retained. Local governments determine if benefits outweigh negative effects on the local system, while the state Department of Transportation and Business Development Department make the decision involving the state system.

Affordable Housing:

No special provisions are included.

Anne Arundel County, Maryland

Codification:	Anne Arundel County Code, Article 17 (Subdivision and Development), Title 5 (Adequate Public Facilities)
Facilities:	Roads, Fire Suppression, Schools, Sewer, Storm Drainage, Water
Description:	Maryland law authorizes, but does not require, local governments to adopt adequate public facilities ordinances (APFOs). ⁵⁸ Anne Arundel County establishes adequate public facilities (APF) requirements for roads and other facilities. The APF requirements apply to both subdivision approvals and site development plans that generate more than 50 daily trips. Minor (typically less than 1000 square feet) building expansions in several designated town centers (Odenton and Parole), and all residential development in Odenton, are exempt from APF tests for roads. ⁵⁹
Measurement:	<p>Road facilities in the impact area must operate above LOS “D.”⁶⁰ Roads are counted if they are in existence, if at least 30% of the construction cost is appropriated in a CIP, or they are included in approved mitigation plans.⁶¹ Eligible capital improvement programs include the County CIP and state consolidated transportation program (CTP), and programmed improvements must have all permits approved and rights-of-way assured through agreement, dedication or conveyance. The impact area includes all roads up to the second intersecting arterial road.⁶²</p> <p>If the LOS fails, applicants may mitigate by committing to construction or funding of the necessary improvements, including financial guarantees (bonds, letters of credit, or other security).⁶³ The mitigation requirements include several rules specific to transportation. For freeway interchanges, mitigation must increase intersection capacity to the fullest extent possible without constructing the freeway improvements (in other words, other improvements or efficiencies must be included that add to interchange capacity without the actual interchange construction). For development within 1/2 mile of an existing or program bus or rail transit service, mitigation may include purchase of annual bus passes, installation or construction and maintenance of bus stops and passenger shelters, or enrollment in a ride share program. In the Parole Town Center, mitigation must include public transportation and paratransit or ridesharing. A “Transportation Capacity Mitigation Agreement” may be approved that corrects existing roadway deficiencies and accommodates all phases of a proposed development.</p>
Locational Standards:	LOS “D” is uniform, with the exception of some development or expansion and designated mixed use town centers or districts.
Type Standards:	No special provisions are included for project types, other than for development in the Odenton and Parole growth management areas.
Economic Development:	No special provisions are included.
Affordable Housing:	No special provisions are included.

Potential Action Items and Opportunities

This section of the White Paper explores various issues involving concurrency and LOS, including how the LOS relates to other County goals and policies such as economic development and affordable housing. Each issue presented below includes a summary of the County’s current approach, alternatives to that approach, and a discussion of alternatives or policy considerations.

How should the County measure transportation LOS?

Current Approach	Working with DelDOT, the County currently uses the Highway Capacity Manual to measure LOS. It is unclear which version applies, with the County definition referring to the 1985 version of the manual and DelDOT referring to the 2000 version (although both definitions refer to the latest version).
Alternatives	<ul style="list-style-type: none"> • Continue the status quo • Amend the DelDOT Agreement and UDC to reference the 6th edition of the Highway Capacity Manual • Amend the DelDOT Agreement and UDC to clarify how LOS is determined with regard to road facilities. • Clarify how multimodal improvements factor into the LOS determination. • Consider network-based or areawide evaluations or allocations in lieu of localized intersection or road segment analyses.
Discussion	<ul style="list-style-type: none"> • The current approach makes it unclear – at least from the face of the County UDC and DelDOT regulations – which version the Highway Capacity Manual applies, and how it applies. While County, DelDOT and applicants can resolve these issues on a case by case basis, a clear approach would reduce uncertainty and minimize the potential for delay. • The current (6th or 2016) edition of the Highway Capacity Manual reflects the latest thinking and best practices on LOS measurement, but is not as familiar to traffic engineers as the 1985, 2000, or 2010 Manuals. Adoption of the 6th edition on a phased basis could begin to build consultant and staff capacity familiar with multimodal analyses. • The charts in the 2000 Highway Capacity Manual sometimes refers to vehicle delay, and also to volume to capacity (v/c) or other metrics. A single metric could build consistency into transportation modelling and create a clearer linkage to the relationship between development and transportation network performance. For example, new development directly affects the volume and density of traffic, and therefore the v/c ratio, but has an indirect relationship to traffic speeds. • The DelDOT rules suggest that multimodal improvements or transit are considered on a case by case. This requires applicants to justify how non-roadway improvements factor into the LOS test on a case by case basis, and therefore reduce incentives to build multimodal capacity into the roadway network. A clear set of metrics, credits toward ultimate transportation capacity, and how this affects the LOS test can incentivize the deployment of bus, transit, bikeway, and pedestrian improvements as part of the overall network. • Localized TIS studies ignore the impacts of development on the wider network, or the benefits of development in built up locations that have shorter average trip lengths, access to transit, or similar features. In addition, some communities (such as Montgomery County, Maryland) have used areawide allocations of development thresholds based on LOS to forecast the impacts of the adopted LOS directly. This can reduce the need for ad-hoc TIS processes and provide a better basis for network planning that considers all important policy decisions relating to the ultimate LOS – such as whether the appropriate LOS metric applies to an area, the package of improvements that work best for both capacity and community character, etc.

Should the LOS vary by location in the County? How should LOS apply to different locations?

Current Approach LOS varies by sewer service area, with potential for LOS E in sewer developed or infill areas

- Alternatives**
- Maintain the status quo
 - Maintain the existing LOS, but define or map “Existing Developed Areas” or “Designated Infill Areas” that would qualify for a reduced LOS. The character areas in the Guiding Principles could be used as a starting point, with smaller areas qualifying for a reduced LOS based not only on their location, but also a mix of uses and design features that create more efficient travel patterns.
 - In addition to or as an alternative to the LOS “E” metric for developed or infill areas, consider replacing traffic LOS with a multimodal availability standard

- Discussion**
- The status quo does recognize the differences between areas with public services (sewer) and relatively undeveloped or agricultural areas. It also recognizes that the County does have the level of urbanization found in Wilmington, Philadelphia, or Newark. However, the character of development and traffic levels vary widely within the existing sewer service area. In addition, the status quo misses the opportunity to target development in areas that are currently built up and are candidates for mixed use or transit oriented development that creates lower travel demands, or could absorb development that would otherwise spread vehicle traffic over wider areas of the roadway network.
 - Mapping areas that qualify for a reduced LOS signals to the development community that they qualify for the higher development potential, streamlined processing or lower development costs associated with a LOS reduction. It also minimizes the potential for arbitrary or inconsistent decisions about whether a development qualifies as “existing developed” or “infill.” However, there should be public outreach and comments about the areas that would qualify for this incentive.
 - LOS “E” represents a high level of congestion. Requiring a TIS that is limited to road improvements does not resolve congestion issues because it simply recognizes that congestion will continue. Expanding road capacity could contradict County policy by inducing further congestion on dependence on a single mode of travel. Replacing a conventional LOS with a broader quality-based metric encourages more compact and efficient development patterns and the potential for modal shifts.

Central Avenue, St. Petersburg, FL



Some communities designate existing built-up areas for concurrency exemptions or lower LOS standards

Should the County use LOS to target economic growth areas more effectively? What are the best ways to accomplish this?

Current Approach The current level of service does not create clear incentives for economic development or job creation. The Department of Land Use may “consider” economic development in considering whether to grant a TIS waiver. A TIS waiver requires a traffic mitigation agreement (TMA) and County Council approval, and is limited to designated infill areas, the Southern New Castle County Sewer Service Area, or areas where roads are currently deficient.

- Alternatives**
- All non-residential development should remain subject to TIS and the current level of service or the TIS waiver process. This would apply even if the development is within an Economic Empowerment District (EED).
 - Apply a TIS subject to the existing LOS when an EED is applied, but exempt subsequent major land development or subdivision applications within the EED from further TIS review if they are within the original EED parameters.
 - Reduce the LOS that applies to an EED only if it incorporates target industries that are more refined than those in the current EED legislation, and incorporate certain design features such as transit accessibility, open space, and building design beyond those in the current EED legislation as hard standards.
 - Allow the Department of Land Use or County Council to waive a TIS for an EED.
 - Reduce or eliminate the LOS that applies to an EED.
 - Reserve a given level of capacity in designated areas for EEDs.
-

- Discussion**
- Because the EED does not adjust the LOS or the TIS submittal requirements, it creates no incentives or advantages for producing the County’s target industries. In addition, major land use plans that follow an EED rezoning may have to submit their own TIS, even if they are within the use and dimensional parameters of the EED rezoning. While there are some streamlining features of development that occurs within a zoned EED, the current TIS status was discussed extensively with community stakeholders. The current TIS status was discussed extensively with community stakeholders.
 - The TIA legislation (9 Del. C. § 2662) includes a provision that allows the County to establish a “Complete Community Enterprise District” (2 Del. C. §§ 2103 and 2104) through an agreement with DelDOT. A Complete Community requires a master development plan and transportation study, along with some specific parameters (contiguity, minimum and maximum area of 1 to 9 square miles, and an isoperimetric quotient of at least 0.7). Density must be sufficient to enable frequent transit service, and the residential zoning area must exceed the commercial zoning parameters. A Complete Community is also exempt from off-street parking. These parameters are probably unworkable for many projects that could provide high-quality jobs without larger residential areas, or on smaller parcels. The off-street parking exemption may not work for some neighborhoods, with many UDC update participants insisting that existing parking levels be maintained.
 - The County could combine the EED district with Transportation Improvement Districts (TID). Under the DelDOT Regulations, a TID is created by an act of the General Assembly, an action of the Council of a Metropolitan Planning Organization (such as WILMAPCO), or a Memorandum of Agreement between DelDOT and the County.⁶⁴ This requires upfront transportation planning to coordinate anticipated development with the County’s preferred level of service at these locations. In addition, the UDC could be amended to clarify that a TIS is not required in a TID (because the upfront planning quantifies development impacts), and that development is obligated only to pay a fee or provide mitigation as specified in the TID agreements.

Should the County use LOS to Incentivize Affordable Housing?

Current Approach The current level of service does not create clear incentives for affordable housing. The Department of Land Use may “consider” affordable housing in considering whether to grant a TIS waiver. A TIS waiver requires a traffic mitigation agreement (TMA) and County Council approval, and is limited to designated infill areas, the Southern New Castle County Sewer Service Area, or areas where roads are currently deficient. The County currently requires Moderately Priced Dwelling Units (“MPDUs”) on certain applications that increase density, and also awards density bonuses for providing MPDUs (UDC § 40.07.510, 40.07.0520). MPDUs are subject to a 10-year affordability period for the date of first sale (UDC § 40.07.560).

- Alternatives**
- Affordable housing projects should remain subject to TIS and the current level of service. This would apply even if the development is restricted as MPDUs.
 - Apply a TIS subject to the existing LOS for market-rate housing, but apply a LOS exemption or a lower LOS to MPDUs.
 - Apply a lower LOS or exemption to MPDUs only during the period of affordability, but provide for the recapture of mitigation in a Master Development Agreement (UDC § 40.07.561) or a TM Agreement when the homes are sold at market rates.
 - Reserve a given level of capacity in designated areas for MPDUs.

- Discussion**
- The MPDU regulations do not create any LOS incentives. Providing MPDUs does not streamline the TIS process or reduce traffic mitigation costs.
 - Affordable housing incentives could also be provided as part of “Complete Community Enterprise Districts” or TIDS (see discussion above).

Charlotte First Ward



Capacity allocations can be reserved for workforce housing or MPDUs

Should the County use LOS to Incentivize Development with Placemaking Elements?

Current Approach Developments with placemaking typically include a mix of complementary uses, street and public space connectivity, and building design elements that allow for walkability or multiple modes of travel. The TN, CR, and CN districts together allow both residential uses and mixed use categories such as commercial apartments (i.e., apartments that are physically attached above, beside, or to the rear of a nonresidential structure), hamlets, villages, and mixed use development. In addition, there are several listed “uses” in the UDC’s general use table that include a mix of residential and nonresidential uses. These include commercial apartments, hamlets, villages, and mixed use. In addition, Villages, Hamlets and the Traditional Neighborhood (TN) District include specific requirements for use mix and placemaking elements. However, these provisions do not include specific references to the LOS standards that recognize potential opportunities for internal trip capture (i.e., trips with both origins and destinations onsite) or the potential to substitute vehicle trips for other travel modes.

- Alternatives**
- Projects with placemaking elements would remain fully subject to the LOS and TIA provisions. This would apply even if the development is developed as a Village, Hamlet or TND.
 - Reduce the LOS for development in defined areas that incorporate designated placement principles, with minimum levels of commercial or employment-based uses, accessible transit, or related features.
 - Retain the existing LOS, but build minimum specified trip reductions into the TIA review to reflect the potential for trip capture.

- Discussion**
- The existing mixed use definition, and the Village, Hamlet and TND regulations do not create any LOS incentives. Providing placemaking elements does not streamline the TIS process or reduce traffic mitigation costs, and the review of TIAs may not accurately reflect the potential for internal capture or modal shifts.
 - Placemaking incentives could also be provided as part of “Complete Community Enterprise Districts” or TIDS (see discussion above).

Addison Circle, Addison, TX



LOS Standards can accommodate developments that incorporate placemaking principles and transit access



Should the County Adjust its Process for Reserving Capacity?

Current Approach Because a TIS must consider existing approvals, those approvals can tie up available transportation capacity. In practice, this can occur indefinitely. The County does not formalize when capacity reservations expire, establish any conditions to reserve capacity, or address any broader administrative or policy issues such as long-term master plans, infill or economic development.

The UDC currently establishes a 5-year sunset period for a subdivision or land development plan (UDC § 40.01.130.A). In addition, state law requires that subdivision or land development applications that do not receive final approval within 5 years after filing are subject to the traffic impact provisions of Articles 5 and 10 of the UDC (9 Del. C. § 2659(b)).

If construction does not commence during that time, the County may reapprove the plan, disapprove the plan, or (for a rezoning approval) revert the parcels to their prior zoning classification (UDC § 40.01.130.D). In practice, the County tends to reapprove plans, and the sunset provisions are not clear about how the County is to track the unused capacity of expired plans. This means that, if the LOS is underperforming due to existing approvals, new applications affecting the roadways are held up.

The County already has a rudimentary “reservation” system. It’s de facto practice is to reserve capacity for approved land development plans and rezonings. For rezoning approvals (UDC § 40.11.121), the Department of Land Use and Delaware Department of Transportation (DelDOT) may waive a traffic impact study if a sufficient study was already prepared in connection with a rezoning. This applies only to rezonings that occurred within 3 years prior to the application. This provision is discretionary, and applicants have no assurance in advance of an application that the Department or DelDOT would determine that a prior study is adequate.

- Alternatives**
- Continue the practice of allowing discretion to reapprove or deny plans after they expire, and to count traffic studies in connection with prior rezonings during the 3-year window before an application.
 - Continue to reserve capacity for a 5-year period, but allow applicants to extend the reservation period by paying a fee or providing offsetting mitigation.
 - Allow longer reservation periods for economic development, affordable housing, or development with placemaking elements as described in this report.
 - Provide that applications expire after the reservation period, or that they cannot be reapproved without a new TIS.

Note: the second and third options above may require an amendment to 9 Del. C. § 2659(b)).

Discussion It is common practice for communities with concurrency requirements to establish a system for reserving capacity. This means that, when the community determines that concurrency is met, the capacity for that approval is debited against available capacity for a specified time period. If construction is not begun or completed during that time period, the approval expires and the capacity tied to that application is added back to the system. Concurrency reservation is used to accomplish several things:

- Allow existing approvals to proceed – either to the next step of the process or through construction – without having to reengage concurrency review.
- Avoid tying up capacity indefinitely for speculative projects.
- Minimize the time when a road is operating at an acceptable level of service, but failing on paper due to reservations of capacity for unbuilt projects.⁶⁵
- Avoid equity and funding issues resulting from development approvals that tie up capacity without paying for its impacts, with subsequent development delayed or incurring mitigation costs:

The systems for managing concurrency allow developers to reserve existing capacity and require no developer contribution for that capacity. Those that ultimately trigger a “concurrency deficiency” must then bear the burden of improvements necessitated in part by “free riders”. This issue of the “last guy in pays”, combined with continuing improvement backlogs and inadequate state and local funding, have raised fairness and equity concerns and arguments that current developers not be held responsible for the “sins of the past”, including the lack of capacity resulting from earlier development.⁶⁶

Key Next Steps

Transportation concurrency is a complicated issue, with strong feelings about how it applies among the general public, developers, businesses, and other stakeholders. The LOS metric affects not only roads, but also related policies and priorities such as jobs, housing availability and costs, and the character and design of new development. The previous section (Potential Action Items) lists key issues and alternatives for addressing them.

Any changes to the existing LOS and its implementation through concurrency should involve the following steps:

1. **Continue public outreach.** Traffic LOS is very important to many of the County's neighborhood and quality of life. However, TIA review and mitigation and delay or add expenses to development that serves important public interests, such as economic development. It is important to discuss these issues carefully to ensure the long term sustainability of any change in LOS policy or practice.
2. **Explore changes to state law.** This may include:
 - a. Revisions to 9 Del. C. § 2662 to clarify when a TIS is required, the County's authority to adjust LOS metrics, and its ability to apply economic development options outside of the complete community parameters.
 - b. Revisions clarifying the County's authority to collect transportation improvement fees in a designated TID.
3. **Draft amendments to the UDC.** The current LOS review requirements do not reflect many of the best practices used in other communities. If the County wants to implement a change in LOS standards or TIA review, changes to the UDC are needed to ensure that the practices are transparent, predictable and legally enforceable.
4. **Prepare fact sheets and supporting information for UDC amendments.** The fact sheets would explain how the revisions differ from existing practice, document the public outreach leading to the changes, and discuss their rationale.
5. **Amend the DelDOT MOU.** The LOS standards provided in the MOU would need to change to reflect any changes in practice and police relating to traffic LOS.
6. **Address transportation modelling.** Changes in transportation modelling could support TIDs and more effective network modelling.
7. **Revise computerized LOS submittals.** Standardized applications tied to updated transportation modelling provides a more accurate forecast of development impacts, and can streamline the development approval process.
8. **Prepare educational materials for applicants.** Explanatory materials such as improved forms can assist applicants in permit compliance, and in selecting effective mitigation alternatives.
9. **Prepare educational materials for the public.** To the extent that the County changes its traffic LOS and mitigation practices, user-friendly background materials can explain the advantages those practices have for neighborhoods – such as more efficient transportation networks, and improved areawide LOS.

Endnotes

- 1 White & Paster, “Creating Effective Land Use Regulations through Concurrency,” 43 Nat. Resources J. 753 (Summer 2003).
- 2 See note 22 below.
- 3 Florida Statutes § 163.3164(28).
- 4 Robert H. Freilich & S. Mark White, “Transportation Congestion and Growth Management: Comprehensive Approaches to Resolving America’s Major Quality of Life Crisis,” 24 Loy. L.A. L. Rev. 915, 942-43 (1991).
- 5 The UDC definition refers to “report 209,” which is the 1985 version of the *Highway Capacity Manual*. DelDOT appears to follow the 2000 version of the *Highway Capacity Manual* (DelDOT Regulations § 2.9.12.7). The 6th – and latest - edition of the *Highway Capacity Manual* was published in 2016. Transportation Research Board, *Highway Capacity Manual: A Guide for Multimodal Mobility Analysis* (6th ed., 2016). All references to the Highway Capacity Manual in this White Paper refer to the 6th edition unless otherwise indicated.
- 6 Institute of Transportation Engineers, *Transportation Impact Analyses for Site Development An ITE Proposed Recommended Practice* (Washington, D.C.: ITE, 2005), at 56.
- 7 *Transportation Impact Analyses for Site Development, supra*, at 56-66.
- 8 *Transportation Impact Analyses for Site Development, supra*, at 60-62, 64.
- 9 *Transportation Impact Analyses for Site Development, supra*, at 67-69; Institute of Transportation Engineers, *Promoting Sustainable Transportation Through Site Design: An ITE Proposed Recommended Practice* (Washington, D.C.: ITE, 2004).
- 10 *Transportation Impact Analyses for Site Development, supra*, at 69-70. Bus transit was introduced in the 1965 *Highway Capacity Manual*, with the 1985 *Manual* introducing pedestrian and bicycle research. Erik Ruehr (VRPA Technologies), *Highway Capacity Manual 6th Edition: A Guide for Multimodal Mobility* (July 13, 2016). The 2016 *Highway Capacity Manual* now has a multimodal focus, although it is not yet part of standard engineering license testing.
- 11 Mark White, *Adequate Public Facilities Ordinances and Transportation Management* (American Planning Association, Planning Advisory Service Report No. 465, August 1996); Mark White, *The Zoning and Real Estate Implications of Transit-Oriented Development*, Transit Cooperative Research Program (TCRP) Legal Research Digest, No. 12 (January 1999).
- 12 See National Center for Smart Growth Research and Education, *Adequate Public Facilities Ordinances in Maryland: Inappropriate Use, Inconsistent Standards, Unintended Consequences* (prepared for Home Builders Association of Maryland and Maryland National Capital Building Industry Association, April 20, 2006).
- 13 *Christiana Town Center, LLC v. New Castle County*, C.A. No. 4044-VCS, 2009 Del. Ch. LEXIS 40, *aff’d*, 985 A.2d 389 (Del. 2009), at 6.
- 14 *Christiana Town Center, supra*, at 23-24.
- 15 See DelDOT Capital Transportation Program web page at <http://www.deldot.gov/capital>.

- deldot.gov/Publications/reports/CTP/. See 29 Del. C. § 8409, 8419 (referring to a 6-year “capital improvements program” prepared annually).
- 16 See WILMAPCO Transportation Improvement Program web page at <http://www.wilmapco.org/tip/>.
- 17 *Christiana Town Center, supra*, at 3 (holding that “the UDC does not require that New Castle County second guess DelDOT’s application of its own regulations. The UDC only requires that New Castle County give DelDOT the opportunity to independently analyze traffic effects and apply its own regulations.”).
- 18 In determining whether an application generates significant traffic impacts that warrant a TIS, the UDC references the “projected average daily traffic warrants provided in Table 1, Section 15 of DelDOT’s Rules and Regulations for Subdivision Streets” (UDC § 40.11.120.C.1). This is an outdated reference to § 2.3 of DelDOT’s Standards and Regulations for Subdivision Streets and State Highway Access, 2 DE Admin. Code 2309.
- 19 Standards and Regulations for Subdivision Streets and State Highway Access, 2 DE Admin. Code 2309.
- 20 DelDOT Regulations § 1.5.
- 21 DelDOT Regulations §§ 2.9.13.7 - 2.9.13.7.
- 22 *Christiana Town Center, supra*, at 25-27.
- 23 At least one court decision has determined that the LOS is a benchmark under the 1990 agreement, but not a mandate – although the Delaware Supreme Court appears to have rejected that interpretation. A 2013 Court of Chancery opinion ruled that the statute does not require the County Council to obtain a traffic study or even to consider traffic at rezoning, but rather to make traffic information available as part of the rezoning process. *Save Our County, Inc. v. New Castle County*, 2013 WL 2664187, at 5-6 (Del. Ch. June 11, 2013), *aff’d*, 89 A.3d 51 (Del. 2014). This holding was dicta, because the rezoning was overturned due to technicality with the vote approving the rezoning. In its decision upholding the Chancery Court, the Delaware Supreme Court affirmed that decision but suggested in *dicta* that traffic analysis is, in fact, required before a vote occurs on a rezoning ordinance. 89 A.3d 25, n. 39 (citing a case involving an equivalent statute from Sussex County, *Deskis v. County Council of Sussex County*, 2001 WL 1641338, at *9 (Del. Ch. Dec. 7, 2001)(applying 9 Del. C. § 6962)).
- 24 Memorandum of Agreement Between the Delaware Department of Transportation and the Government of New Castle County, Delaware (March 31, 2008)(“MOU”).
- 25 Transportation Improvement Districts: A Guide for Delaware Local Governments (December 2014), at <http://www.ipa.udel.edu/publications/TID-Guide-2015-Final-Web.pdf>.
- 26 Florida Statutes § 163.3180.
- 27 Orange County Code § 30-520.
- 28 Orange County, Florida Comprehensive Plan 2010 – 2030 Goals, Objectives & Policies (Amended, Effective January 19, 2017), Policy T2.1.3, CIE1.3.3.
- 29 Orange County Code § 30- 561(b).
- 30 Orange County Code § 30-520; Orange County Comprehensive Plan, T2.5.1.B; Florida Department of Transportation, Local Programs, at <http://www.fdot.gov/programmanagement/LP/Default.shtm>.

		29, 2008), at 2.
31	Orange County Comprehensive Plan, OBJ T2.5, T2.5.2; Transportation Research Board, <i>Transit Capacity and Quality of Service Manual, 3rd Ed.</i> (TCRP Report No. 165).	50 <i>Congestion and Improvements White Paper, supra.</i>
32	Orange County Comprehensive Plan, T2.5.7.	51 Kittelson & Associates, Inc., <i>Multi-modal Performance Measures and Standards: Washington County, Oregon</i> (Prepared Washington County Department of Land Use and Transportation, June 30, 2014).
33	Orange County Code § 30-562(c).	
34	Orange County Code § 30-621.	52 Washington County Community Development Code § 501-2. These include a number of detailed exceptions not discussed here.
35	Orange County Comprehensive Plan, FLU2.3.3.	
36	Orange County Comprehensive Plan, Policy T2.8.1.	53 Washington County Community Development Code § 501-7.1.
37	Orange County Code § 30-501, 30-507.	54 Washington County Community Development Code § 501-8.2.
38	City of Orlando, Affordable Housing Certification Process (April 27, 2009).	55 Washington County Community Development Code § 501-8.8.
39	Orange County Code § 30-596(1), -597(1). See City Of Orlando Affordable Housing Certification Process (Adopted By Resolution) (Amendment, April 27, 2009).	56 Washington County Transportation System Plan (effective November 27, 2015), at 32 (Table 3.1).
40	Pierce County Code § 19E.10.010 (citing WAC 365-195-210(4)).	57 Washington County Code § 375-10 (Development Standards for Transit Oriented Districts).
41	Pierce County Code § 19E.10.010 (citing RCW 36.70A.070(6)(e)).	58 Md. Land Use Code Ann. § 7-101(1) (2016)
42	Pierce County Code § 19E.10.030.	59 Anne Arundel County Code § 17-5-201.
43	Pierce County Code § 18.25.030.	60 Anne Arundel County Code § 17-5-401. In the Parole Town Center, each intersection up to the first intersection with an arterial must operate with a peak hour critical lane volume below 1,450 or (with administrative approval) 1,600 in the core.
44	Pierce County Code § 18A.75.030.B.1.f.	
45	Pierce County Code § 18A.75.080.	
46	Pierce County Code § 18.25.030.	
47	Pierce County Comprehensive Plan (effective June 30, 2016), at 3-3.	61 Anne Arundel County Code § 17-5-402.
48	Pierce County Comprehensive Plan, Table 12-B, at 12-26.	62 Anne Arundel County Code § 17-5-403. For the Odenton and Parole growth management areas, areas outside of the district or town center are
49	Pierce County, <i>Congestion and Improvements White Paper</i> (December	

excluded. Some peninsulas in other areas extend to the third intersecting arterial.

63 Anne Arundel County Code § 17-5- 901

64 DelDOT Standards and Regulations for Subdivision Streets and State Highway Access, 2 DE Admin. Code 2309, § 2.3.4.1.

65 Center for Urban Transportation Research, *Transportation Concurrency Requirements and Best Practices: Guidelines for Developing and Maintaining an Effective Transportation Concurrency Management System (September 2006), at 23.*

66 Center for Urban Transportation Research, *Technical Memorandum 1: Current Practices And Regulatory Concepts, Model Fair Share Ordinance for Transportation Concurrency (September 2005), at 4.*