

Montgomery County, MD

Jurisdictional Context

The Montgomery County Planning Board is responsible for approving private sector development projects for the unincorporated areas of the County. Cities and some towns have local planning and zoning authority. Maryland is a “home rule” state, with strong local planning and zoning authority. Montgomery County considers the development review process an element of master plan staging; both the land development and the transportation projects, goals, and objectives in the local Master Plans and Sector Plans have a long-term horizon (>25 years). In 2012, the County restructured its biennial “Growth Policy” as a quadrennial “Subdivision Staging Policy”.

Montgomery County in a box

Population (2013)	1,016,677
Population growth since 2010	4.6%
Jobs (2014 per BLS)	479,830
Geographic Area (sq mi)	491.25
Metropolitan Area	Washington-Arlington-Alexandria, DC-MD-VA-WV
Relevant Resources	LATR/TPAR Guidelines: http://www.montgomeryplanning.org/transportation/latr_guidelines/latr_guidelines.shtm Transportation Impact Tax http://www.montgomeryplanning.org/research/growth_policy/subdivision_staging_policy/2012/documents/SSPappendix3dc.pdf
Current procedure adoption dates	LATR/TPAR Guidelines (1/2013) http://www.montgomeryplanning.org/transportation/documents/latr_tpar_guidelines_master_key_reduced.pdf Transportation Impact Tax (7/2013) http://permittingservices.montgomerycountymd.gov/DPS/pdf/NewAndRevisedImpactTaxesEffectiveJuly12013.pdf

Development Impact Policy Tools

Montgomery County uses a three-tiered approach to development exactions:

- A **transportation impact tax** covers the basic “hookup” costs to the transportation system
- A **Local Area Transportation Review** process identifies transportation deficiencies based on conditions proximate to the development site

- A **Transportation Policy Area Review** process identifies transportation deficiencies based on conditions throughout the Policy Area in which the site is located

In most cases, developer funds spent to mitigate LATR or TPAR impacts through improvements to the County roadway system or transit/TDM improvements can be claimed as a credit against the transportation impact tax.

Figure 1 from the *Local Area Transportation Review / Policy Area Mobility Review Guidelines* demonstrates the relationship between the LATR and TPAR processes.

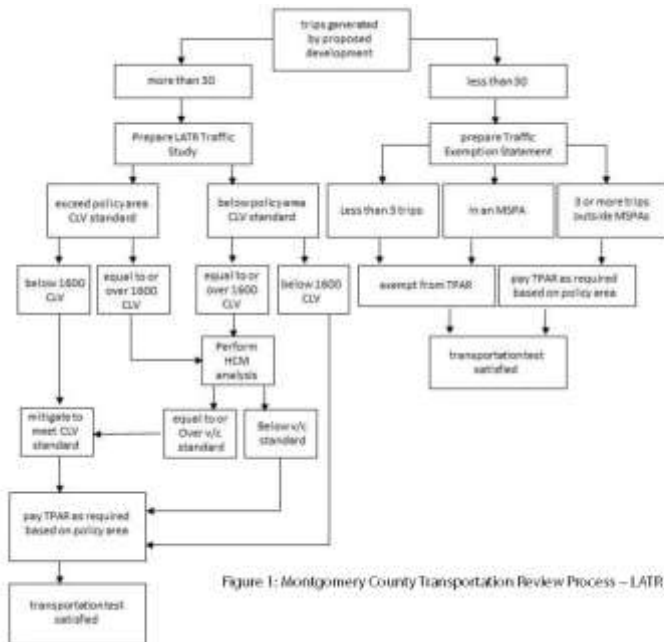


Figure 1: Montgomery County Transportation Review Process – LATR and TPAR

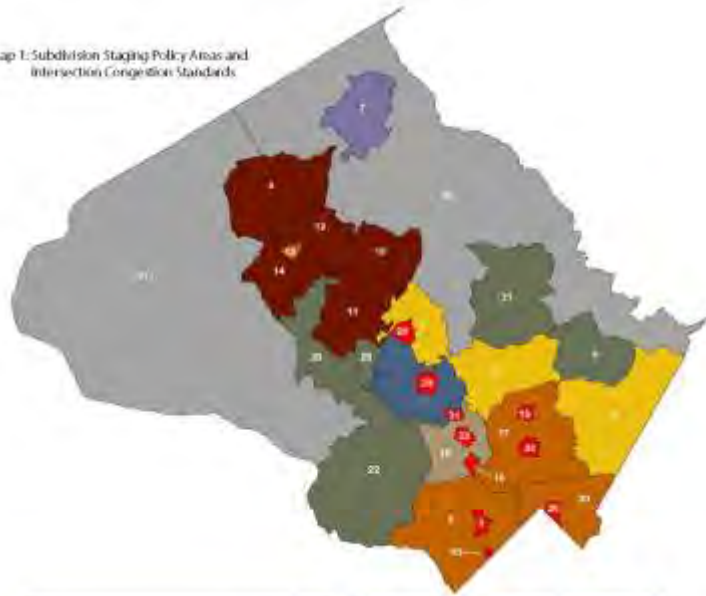
Context-Sensitive Variance

Several policy nuances and exceptions seek to balance transportation and other community quality of life objectives:

- The County is divided into 33 Policy Areas, each with its own CLV congestion standard for LATR and transit / roadway adequacy standards for TPAR based on the Policy Area’s position in the urban-suburban-rural land use transect. These **varying congestion and transit adequacy standards** recognize that in more urban areas, transit and non-motorized quality of service criteria should be more stringent and traffic congestion is more acceptable, whereas the objectives are reversed in more suburban and rural areas. Map 1 from the *Local Area Transportation Review / Policy Area Mobility Review Guidelines* shows the LATR relationships graphically (since the document publication date, the Fairland/White Oak Policy Area has been divided into two separate policy areas in conjunction with the adoption of the White Oak Science Gateway Master Plan).
- Commercial development in the 430-acre **White Flint Sector Plan area pay an annual ad-valorem special district tax** in lieu of any transportation impact exemption to provide a comprehensive way of assembling funds for a suite of needed transportation improvements that will be constructed by the State or County to streamline coordination during implementation and facilitate right-of-way acquisition through eminent domain as appropriate.

- Development in **Metro Station Policy Areas** may choose one of two **Alternative Review procedures** that replace LATR and/or TPAR requirements with a commitment to reduce peak hour vehicle trip generation by 50% through participation in a legally binding Traffic Mitigation Agreement (TMAg), with

Map 1: Subdivision Staging Policy Areas and Intersection Congestion Standards



policy area	critical lane volume standard	policy area	critical lane volume standard
25 Rural East	1,350	26 Rockville City	1,500
27 Rural West	1,350	19 Hunt Beltsville	1,500
7 Damascus	1,400	4 Beltsville Chevy Chase	1,500
5 Clarksburg	1,425	17 Kensington/Wilmetts	
11 Gaithersburg C/A		13 Germantown Town Center	
12 Gaithersburg East		30 Silver Spring Takoma Park	
14 Gaithersburg West			
18 Montgomery Village/Alexandria		3 Beltsville CBD	1,500
6 Clowery		10 Friendship Heights CBD	
20 Huddersfield	1,450	29 Silver Spring CBD	
21 Olney		27 Wheaton CBD	
22 Beltsville		15 Gaithersburg MSA	
23 E&D Village		16 Gaithersburg MSA	
2 Aspen Hill	1,475	25 Rockville Town Center MSA	
8 Deale		28 Shodds Grove MSA	
9 Fairland/White Oak		31 Takoma Park MSA	
		32 White Flint MSA	

- Most intersections in the Potomac Policy Area, where most traffic is locally generated and a two-lane roadway policy seeks to maintain a **more rural environment**, are exempt from LATR requirements and the TPAR roadway standard.
- Certain types of commercial development that contributes to the County’s **public health objectives**, including bioscience facilities, hospitals, and social service agencies are exempt from the Transportation Impact Tax

Local Area Transportation Review

LATR determines the adequacy of local roads by measuring congestion at roadway intersections based on critical lane volume (CLV) and volume to capacity ratio (v/c). The estimated vehicle trips generated by a proposed development are compared to the applicable policy area standard to evaluate likely future congestion. The development’s trips that contribute to nearby intersections exceeding the standard must be mitigated in some fashion.

Analysis Tools and Thresholds

Any development generating 30 or more peak hour vehicle trips must conduct an LATR study. This threshold is more stringent than most jurisdictions, where 50 or 100 vehicle trip thresholds are most common, and the 100 trip threshold is recommended by the *TIASD*.

The LATR process relies heavily on intersection Critical Lane Volume (CLV), a planning-level intersection capacity procedure. In congested areas, where an intersection’s forecasted volume-to-capacity ratio

(v/c) is greater than 1.0 (at a value of 1600 CLV), the CLV analysis is supplemented by operational analysis of queuing using Highway Capacity Manual techniques or a similar commercial analysis tool such as Synchro.

Mitigation Approaches

While the LATR deficiencies and impacts are identified through a somewhat auto-oriented CLV analysis process, the mitigation approaches prioritize site vehicle trip reduction and other TDM and non-motorized improvements. Applicants can demonstrate and commit to actual site vehicle trip reduction objectives through participation in a binding Traffic Mitigation Agreement (TMAg), or claim credit for other non-automobile facilities at a value of \$12,000 per peak hour vehicle trip mitigated, regardless of whether or not those facilities actually reduce site generated trips. Otherwise, intersection improvements that mitigate the CLV impacts directly are accepted. Mitigation of CLV impacts requires achieving at least one of the following two objectives:

- Bringing an unacceptable intersection CLV down to the Policy Area standard, or
- Mitigating 150% of the development's CLV impact (typically applied when an intersection CLV is already well in excess of the Policy Area standard)

Areawide Review

Montgomery County has operated both local and areawide review processes in tandem continuously since 1993, with several adjustments to the policy area review procedure during that timeframe. The TPAR process was adopted by the County Council in fall 2012.

Any development generating three or more peak hour vehicle trips is subject to TPAR. The TPAR test first considers whether a policy area is considered inadequate for transit or roadways (or both). If the area is inadequate, a development in the area must make a Traffic Mitigation Payment based on the number of dwelling units or square footage of nonresidential space, or make improvements that increase capacity in the policy area to address identified specific roadway and transit inadequacies.

The Traffic Mitigation Payment is defined as a payment in addition to, and related to, the Transportation Impact Tax. The initial Traffic Mitigation Payment applies in about half (18) of the 33 Policy Areas, and in each of those areas the payment is equal to 25% of the applicable Transportation Impact Tax.

Transportation Impact Tax

The Transportation Impact Tax is established based on a generalized apportionment of countywide transportation capital project in the regional CLRP across a 25-year horizon, the amount of local agency funding needed to construct those capital projects in current dollars, and the number of new peak hour vehicle trips expected to be generated by development over the same time horizon. The \$12,000 per vehicle trip value used in LATR mitigation has the same analytic basis, and the Countywide transportation impact tax rates per housing unit and commercial square footage reflect the variation in vehicle trip generation rates and the \$12K/trip basis. Transportation Impact Tax rates are reduced by 50% in Metro Station Policy Areas where vehicle trip generation rates are known to be substantially

lower, and are doubled in the Clarksburg Policy Area where development exaction priorities have reflected a greater reliance on areawide development contributions.

Where to Next?

The Montgomery County Planning Board and County Council are investigating options to improve the multimodal nature of the transportation impact analysis process and refine policies to better incent smart growth outcomes. This process will result in recommendations for Planning Board consideration in Spring 2015 and County Council consideration in Fall 2015. This literature review is the first step in that process.

CITY OF LOS ANGELES

Jurisdictional Context

Los Angeles is the largest city in California based on population. The city is mostly built out and most new developments are infill or redevelopment projects. Los Angeles has historically been known for being an auto-oriented city, but in recent decades, a strong public transit component has been added that includes extensive commuter rail service (provided by Metrolink) as well as a heavy-rail/subway system, several light rail lines, BRT service, and extensive rapid bus service. Transit service other than commuter rail is provided by LA Metro, a County-based transportation commission.

Like Maryland, California is a “home rule” state, with strong local planning and zoning authority reserved for cities. Similarly to Montgomery County the land development and the transportation projects, goals, and objectives in the local General Plan and Regional Plans have a long-term horizons (20-25 years). Project-level Environmental Review is coordinated by the Department of Public Works, Development Services division.

Like other jurisdictions in California, Los Angeles is expected to be subject to the provisions of SB 743 in the near future, which amends statewide environmental impact guidelines to eliminate measures of motorist delay (including roadway Level of Service/LOS) in favor measures more directly related to greenhouse gas (GHG) emissions from motor vehicles, specifically vehicle trips (vt) and vehicle miles traveled (vmt). Guidelines for the implementation of SB 743 are still in draft form, and will not take full effect until late 2015, at the earliest.

Los Angeles in a box

Population (2013)	3,884,307 – 3 million and growing
Population growth since 2010	2.4% -- growing
Jobs (2014 per BLS)	1,679,859 --
Geographic Area (sq. mi)	468.67 --
Metropolitan Area	Los Angeles-Long Beach-Anaheim, CA); The Los Angeles Metropolitan Transportation Commission (LA Metro), works within the Southern California Association of Governments (SCAG) as the MPO. LA Metro covers the City of Los Angeles and the rest of Los Angeles County and SCAG covers 6 counties in total.
Relevant Resources and Sources	<i>Los Angeles Department of Transportation Traffic Study Policies and Procedures (2014)</i>

Development Impact Policy Tools

The City of Los Angeles relies on Traffic Impact Analysis (TIA) reports to ensure that new development projects comply with all applicable transportation policies and regulations. As part of the environmental review process, a TIA must be prepared in order to comply with the city's transportation policy, any area development policy, and the Congestion Management Program which tracks and mitigates transportation effects at the County level. The TIA must identify the impact of the proposed development on the surrounding transportation network, as well as the specific development impacts and any required mitigation measures.

Typically, TIAs are prepared by a traffic consultant hired by the applicant. Los Angeles Department of Transportation staff, working closely with the consultant, identifies intersections to be studied and provide available existing and background information. Upon submittal of the completed traffic report and the traffic review fee to the city, staff will review the consultant's analysis to ensure compliance with the city's level-of-service (LOS) policy and the Congestion Management Program. After review, the TIA becomes part of the environmental documentation necessary for project approval.

Traffic Level of Service

Level of Service is a measure of traffic congestion at signalized intersections. The standards used by the City of Los Angeles to measure the Level of Service within the areas subject to this policy are described below.

The City's goal is to achieve an overall Level of Service of "D" at signalized intersections.

Policy Implementation

Significant LOS Impacts

A significant LOS impact occurs when the TIA demonstrates that the proposed development would cause the Levels of Service at an intersection to fall below LOS D with the addition of project traffic to baseline conditions.

When a significant impact occurs, the TIA must also identify improvements that would reduce traffic congestion so that the intersection operates at the level that would occur without the proposed project.

Mitigation for LOS Impacts

In addition to roadway improvements, the City's Traffic Study Policies and Procedures list a number of alternative mitigation measures that can be used with proper justification and with the approval of City staff. These include:

- Transportation Demand Management (TDM) programs
- Transit capacity and access improvements
- Parking management measures
- Jobs/housing balance measures
- Traffic signal operational improvements
- Fair share contributions

Context-Sensitive Variance: Exception Areas and Protected Intersections

in the City allows a transit credit of 10% to 25% in terms of reduced trip generation for projects that are near transit stations or Rapid Bus stops.

Congestion Management Agency (Subregional Impact Analysis)

The Los Angeles Metropolitan Transportation Authority (LA Metro) is the Congestion Management Agency (CMA) for Los Angeles County. LA Metro maintains LOS guidelines and TIA guidelines that provide a uniform method for evaluating the impacts of land use decisions affecting the Congestion Management Program (CMP) system, as contained in Appendix "D" of the 2010 CMP for Los Angeles County. When projects exceed specified minimum trip contributions to regional facilities, the project traffic impact analysis is required to comply with CMP guidelines in addition to the City's traffic impact study guidelines.

LA Metro requires all local jurisdictions to conform to the CMP TIA guidelines to evaluate the transportation impacts of all land use decisions within the Member Agency's jurisdiction that are projected to generate 100 or more AM or PM weekday peak-hour trips. Any non-conformance issues in the TIA should be identified and clearly presented. While the VTA's TIA guidelines provide a basis for analysis, the City of San José's TIA guidelines differs from the VTA's guidelines.

The City has implemented a Traffic Impact Fee (TIF) program to fund mitigation measures needed to accommodate future traffic conditions resulting from implementation of the NSJ Policy as described in the traffic analysis and EIR. The TIF is assessed on all new residential and industrial development within the Policy area and shall be collected at issuance of Building Permits. Fees will only be levied for new development beyond existing development rights.

The TIF equitably distributes the cost of the necessary infrastructure improvements on a cost per trip generated basis amongst the total development addressed through the NSJ Policy (e.g., 26.7 million square feet of office/industrial/ supporting retail development and 32,000 residential units). The fee initially was set at \$10.44 per square foot for all new industrial/office/R&D development, at \$6,994 per unit for new single-family residences, and at \$5,596 per unit for new multi-family residences. These fees are adjusted automatically every two years according to the policy and will be reviewed every five years to account for changes in

Pasadena, CA

Jurisdictional Context

Pasadena lies in Los Angeles County; its historic downtown is ten miles northeast of downtown Los Angeles. Outside of the downtown, which has been revitalized as a mixed-use district over the past 25 years, the City is largely oriented toward automobile transportation. Pasadena is served by the LA Metro Gold line (light rail) as well as an extensive bus system.

Like Maryland, California is a “home rule” state, with strong local planning and zoning authority reserved for cities. Similarly to Montgomery County the land development and the transportation projects, goals, and objectives in the local General Plan and Regional Plans have a long-term horizons (20-25 years). Project-level Environmental Review is coordinated by the Community Development and Planning Department, which substantial technical and policy input from the Department of Transportation. The City established a separate Department of Transportation (PasDOT) in 2002 to provide for increased policy oversight and effective program implementation of citywide goals.

Like other jurisdictions in California, Pasadena is subject to the provisions of SB 743, which amends statewide environmental impact guidelines to eliminate measures of motorist delay (including roadway Level of Service/LOS) in favor measures more directly related to greenhouse gas (GHG) emissions from motor vehicles, specifically vehicle trips (vt) and vehicle miles traveled (vmt). Guidelines for the implementation of SB 743 are still in draft form, and will not take full effect until late 2015.

Pasadena City in a box

Population (2013)	139,731
Population growth since 2010	1.9%
Jobs (2014 per BLS)	103,140
Geographic Area (sq. mi)	22.97
Metropolitan Area	Los Angeles–Long Beach–Santa Ana MSA; Los Angeles CSA
Relevant Resources and current procedure adoption dates	<ul style="list-style-type: none">• <i>Traffic Impact Report Preparation Guidelines</i> (2008)• <i>Traffic Reduction and Transportation Improvement Fee</i>. Fee program effective since 2006. Latest Summary document dated July, 2013• <i>New Transportation Performance Measures for Transportation Impact Analysis</i>, PasDOT Memo to the Planning Commission (May 28, 2014)

Current Development Impact Policies and Policy Tools

Thresholds for Study

The threshold for study to determine if significant impacts on transportation and circulation would occur is based on Appendix G of the State of California *CEQA Guidelines* (the Environmental Checklist commonly known as the Initial Study form) and the City of Pasadena Department of Transportation standards. The City of Pasadena Department of Transportation has established a procedure for the

preparation of project traffic impacts reports to ensure consistency of analysis and adequacy of information presented. This procedure is summarized in *Traffic Impact Report Preparation Guidelines*, which is the guide used for the preparation of traffic reports.

A traffic study is to be conducted and a subsequent report submitted for any project requiring a discretionary action (such as a Conditional Use Permit or Use Permit for a Major Project) or a legislative action (such as a zone change and/or general plan amendment), if the project size or traffic generation exceeds specified minimum criteria. The applicant will provide the traffic study, prepared by a registered (State of California) traffic engineer that meets the approval of PasDOT.

As detailed in the *Traffic Impact Report Preparation Guidelines* the Transportation Department uses a sliding scale to assess intersection impacts. The sliding scale method requires a developer to mitigate project traffic impact

whenever project generated traffic causes the Level of Service (LOS) of the identified intersections to increase by an amount equal to or greater than the amount listed in the adjacent Table 2.16-1.

**TABLE 2.16-1
CHANGE IN LEVEL OF SERVICE SIGNIFICANCE TABLE**

Intersection Level of Service Under Current Conditions	Increase in Intersection Level of Service due to Project Traffic Considered Significant (v/c)
A	0.060
B	0.050
C	0.040
D	0.030
E	0.020
F	0.010

The City of Pasadena normally considers a project to have an impact on transportation and traffic that needs study if the project will:

1. Generate substantial additional vehicular movement in relation to existing traffic and load capacity of street system;
2. Create an increase of 50 or more peak hour trips on a freeway on- or off-ramp, or add 150 or more trips, in either direction, on the mainline of a freeway during a weekday peak hour thereby exceeding the Los Angeles County Congestion Management Plan thresholds for study;
3. Affect existing parking facilities, or create a demand for new parking;
4. Substantially impact existing transportation systems;
5. Alter present patterns of circulation or movement of people and goods;
6. Create inadequate emergency access;
7. Cause alterations to waterborne, rail, or air traffic; or
8. Increase traffic hazards to motorists, bicyclists, or pedestrians due to design or other features;

The following table (2-16.2) is generally used to determine if a project meets these thresholds for study a more general traffic assessment vs. a full TIA.

**TABLE 2.16-2
TRAFFIC STUDY DETERMINATION MATRIX**

TYPE	Exempt	Traffic Assessment	Traffic and Parking Impact Analysis
Residential (based on # of units)	4 units or less	5 – 25 units	26+ units
Commercial (based on # of trips*)	Less than 70 daily trips and less than 10 trips in any peak hour	71 – 150 daily trips or 11 – 20 trips in any peak hour	151+ daily trips or more than 21 trips in any peak hour
<p>*Trip generation is normally calculated using the Institute of Transportation Engineers (ITE) "Trip Generation 7th Edition" handbook, or successor to this document. In instances where the project does not fit into a land use analyzed in the handbook, or where the handbook cites outdated or insufficient studies for its basis (even in the latest edition of the handbook) contact the Pasadena Department of Transportation for guidance in determining the project's trip generation.</p> <p>**Based on net new trips or net new number of units.</p>			

Parking Impact Analysis: Pasadena requires the following questions be considered to determine if the project would affect existing parking facilities, or create a demand for new parking; if any are answered affirmatively, a parking study is required:

- Would the project result in the physical alteration of an existing parking facility?
- Would the project result in temporary road closures or other temporary physical changes that could disrupt the use of an existing parking facility?
- Would the project's parking demand exceed the parking supply proposed by the project?
- Would the project increase the use of an existing parking facility?

Transit Impact Analysis: The following questions must be answered to determine if the project would substantially impact existing transportation systems; affirmative answers require additional study.

- Would the project result in the physical alteration of an existing bus stop, transit stop, transit-support facility, bikeway, or other transportation facility
- Would the project increase the use of an existing bus stop, transit stop, transit-support facility, bikeway, or other transportation facility beyond that facility's capacity?

Traffic Patterns: The following questions should be considered to determine if the project would alter present patterns of circulation or movement of people and goods:

- Does the project involve the elimination or creation of a through-route?
- Does the project involve a change in the directional pattern of a roadway?
- Does the project involve a change in the horizontal configuration of a roadway (i.e. reduction or addition of travel lanes, turning lanes, etc.)?

Emergency Access: The following should be considered to determine if the project would create inadequate emergency access:

- Does the project involve the elimination of a through-route or narrowing of the drivable space of a roadway? If so, additional investigation is normally required.

- Does the project involve installing roadway with a single ingress/egress point, or adding structures to an area supported by a single ingress/egress point? If so, additional investigation is normally required. *In such a case, contact the Pasadena Department of Transportation and the Pasadena Fire Department to determine the appropriate investigation.*
- Does the project involve installing roadways, access roads, or drive lanes that do not meet the Fire Department’s access standards? (Access standards include, but are not limited to, minimum roadway widths to accommodate Fire Department vehicles.)

Rail, Air and Other Modes: The following questions should be considered and addressed as appropriate:

- Does the project involve installation of or physical alteration of a rail facility?
- Would the project result in the increased use of a railway, rail depot, airport, shipping port, or other rail, air, or water traffic facility, such that the facility would need to be altered to support the project.

Road Safety: The following should be considered to determine if the project would increase traffic hazards to motorists, bicyclists, or pedestrians due to design or other features:

- Does the project involve installation of a roadway, access road, driveway, or other vehicle, bicycle, or pedestrian facility that does not meet the City’s design requirements? (Design requirements include, but are not limited to, site distance and curve radii.) If so, additional investigation is normally required. In such a case, contact the Pasadena Department of Transportation to determine the appropriate investigation.
- Does the project involve alteration of a roadway, access road, driveway, or other vehicle, bicycle, or pedestrian facility in a manner that would cause that facility to not meet with the City’s design requirements? (Design requirements include, but are not limited to, site distance and curve radii.)

If affirmative to either question, additional investigation is normally required.

Pasadena’s Traffic Reduction and Transportation Improvement Fee

As part of the 2004 Update to the City of Pasadena’s General Plan Land Use and Mobility Elements, City Council directed staff to study a new “fair share” transportation impact Fee. The Fee anticipates and mitigates the impacts of growth on City streets, including protecting neighborhoods from increased traffic.

In November 2006, the City Council adopted Ordinance No. 7076 establishing the Traffic Reduction and Transportation Improvement Fee. Current (2013) fee rates are shown at right.

The Transportation Fees for net new development are:	
Residential	\$2,729.64 per unit
Retail	\$9.49 per sq. ft.
Office	\$4.09 per sq. ft.
Industrial	\$3.41 per sq. ft.

Subregional (County) Level Congestion Management Program CMP TIA Thresholds

The 2004 Los Angeles County Congestion Management Plan (CMP) requires a Traffic Impact Analysis for the following projects, per Section 5.2.4 of the CMP:

- a) All CMP arterial monitoring intersections, including monitored freeway on-ramps or off-ramps, where the proposed project will add 50 or more trips during either the AM or PM weekday peak hours. Where project definition is insufficient for meaningful intersection LOS analysis, CMP arterial segment analysis may substitute for intersection analysis. If CMP arterial segments are being analyzed rather than intersections, the study area must include all segments where the proposed project will add 50 or more peak hour trips (total of both directions). Within the study area, the TIA must analyze at least one segment between monitored CMP intersections.
- b) Mainline freeway monitoring locations where the project will add 150 or more trips, in either direction, during either the AM or PM weekday peak hours.

Where to next? Pasadena Anticipates SB 743

As summarized above, Pasadena is currently using a conventional set of performance measures for evaluating system performance and in reviewing the impacts of new development. Intersection volume to capacity ratios and Level of Service are the primary measures. The city also uses a volume-based analysis of change in traffic on street segments to assess impact.

PasDOT recognizes that the current measures are silent with regard to system performance of non-auto modes and tend to generate mitigation solutions that encourage widening of intersections and streets, which may compromise the performance of non-auto modes and are increasingly contrary to community values.

Consequently, a more robust set of measures has been developed that decreases the emphasis on additional vehicle capacity and on reducing individual intersection delay in favor of increasing the emphasis on network management and travel time reliability. To achieve this shift in emphasis, the metrics shift in scale, away from individual location specific measures to corridor or area wide measures.

New Transportation Performance Measures

A May 28, 2014 PasDOT memo describes seven proposed transportation performance measures that collectively assess the quality of walking, biking, transit, and vehicular travel in the City of Pasadena. The proposed update of the City's performance metrics and thresholds addresses the new LOS policy in transportation studies, and defines how to analyze the quality of bicycle, pedestrian, and transit facilities and services. To better align transportation system and network analysis with community values as expressed in the general plan, the performance measures and methods presented below are recommended by PasDOT for use in transportation analysis. These performance measures and significant impact thresholds aim to be used seek to be internally consistent and legally defensible under the current state of the practice.

Each new Transportation Performance Measure corresponds to one of the following three key points:

1. Accessibility and environmental performance
2. Auto performance measures to reflect the state of the practice and tradeoffs between modes and other community values
3. Measures that promote pedestrian, bicycle, and transit mobility

The table below summarizes the metrics and the proposed thresholds for determining an impact. More detailed descriptions and existing values for each metric are available from PasDOT.

METRIC		DESCRIPTION	IMPACT THRESHOLD (GENERAL PLAN)
1.	VMT Per Capita	Vehicle Miles Traveled (VMT) in the City of Pasadena per service population (population + jobs).	Any increase in Citywide VMT per Capita
2.	VT Per Capita	Vehicle Trips (VT) in the City of Pasadena per service population (population + jobs).	Any increase in Citywide VT per Capita
3.	Corridor Travel Times	Auto Travel Times for significant arterials in the City will be determined and forecasted using the Dynamic Traffic Assignment (DTA) Model.	Disclosure Only
4.	Auto Level of Service	Level of Service (LOS) as defined by the Transportation Research Board's <i>Highway Capacity Manual (HCM) 2010</i> . Uses intersection control delay to evaluate auto congestion	Any decrease beyond the established Minimum LOS D Threshold outside designated High Pedestrian Activity Areas.
5.	Proximity and Quality of Bicycle Network	Percent of dwelling units and jobs within a quarter mile of each of three bicycle facility types	Disclosure Only
6.	Proximity and Quality of Transit Network	Percent of jobs located within a quarter mile of each of three transit facility types. The Pedestrian Accessibility Score within each Traffic Analysis Zone (TAZ).	Disclosure Only
7.	Pedestrian Accessibility	The Pedestrian Accessibility Score uses the mix of destinations, and a network-based walk shed to evaluate walkability	Disclosure Only.

San Francisco City and County, CA

Jurisdictional Context

San Francisco is unique among California’s local jurisdictions in that it combines the functions of a City and County. Its 11-member Board of Supervisors is responsible for approving all development projects in the City and County. Like Maryland, California is a “home rule” state, with strong local planning and zoning authority. Similarly to Montgomery County the land development and the transportation projects, goals, and objectives in the local General Plan and Regional Plans have a long-term horizons (20-25 years). Project-level Environmental Review is conducted by the City’s Planning Department. Major transportation infrastructure projects and development projects involving substantial transportation impacts are also reviewed by the San Francisco Municipal Transportation Agency (SFMTA).

Like other jurisdictions in California, San Francisco will be subject to the provisions of SB 743, which amends statewide environmental impact guidelines to eliminate measures of motorist delay (including roadway Level of Service/LOS) in favor measures more directly related to greenhouse gas (GHG) emissions from motor vehicles, specifically vehicle trips (vt) and vehicle miles traveled (vmt). Guidelines for the implementation of SB 743 are still in draft form, and will not take full effect until late 2015.

San Francisco City and County in a box

Population (2013)	837,442 – <i>growing</i>
Population growth since 2010	4% – <i>growing</i>
Jobs (2014 per BLS)	589,717 -- <i>substantially more jobs than workers</i>
Geographic Area (sq. mi)	TBD ~ <i>47 Square miles</i>
Metropolitan Area	San Francisco Oakland MSA (5 counties); The Metropolitan Transportation Commission, MTC which works in tandem with the Association of Bay Area Governments (ABAG) as the MPO, covers 9 counties. The Census-defined San Jose-San Francisco-Oakland, CA Combined Statistical Area covers 11 counties (9 MPO counties plus San Joaquin and Santa Cruz Counties).
Relevant Resources and Sources	<i>Transportation Impact Analysis Guidelines for Environmental Review</i> Transit Impact Development Fee (TIDF) structure: http://www.amlegal.com/nxt/gateway.dll/California/planning/article4developmentimpactfeesandprojectr?f=templates\$fn=default.htm\$3.0\$vid=amlegal:sanfrancisco_ca\$sanc=JD_411

<p>Current procedure adoption dates and ongoing updates</p>	<p>2002 for the Transportation Impact Analysis Guidelines</p> <p>Transportation Significance Criteria used in San Francisco as of 2013: http://www.sf-planning.org/index.aspx?page=1886</p> <p>Transit Impact Development Fee (TIDF) structure First adopted in 1981 (and updated periodically since, most recently in 2012. http://www.amlegal.com/nxt/gateway.dll/California/planning/article4developmentimpactfeesandprojectr?f=templates\$fn=default.htm\$3.0\$vid=amlegal:sanfrancisco_ca\$anc=JD_411</p> <p>Sustainable Transportation Fee (emerging mitigation fee structure) http://www.sf-planning.org/index.aspx?page=3035</p>
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Development Impact Policy Tools and Context-Sensitive Variance

The Transportation Impact Analysis Guidelines for Environmental Review, as published by the Planning Department of the City and County of San Francisco in 2002, outlines the traffic impact methodology used in analyzing developments in the City and County of San Francisco. This tool is in the form of a look-up table with trip rates (per square feet) for various land use types. Unlike most jurisdictions, the San Francisco method estimates person-trips, not vehicle-trips, and then estimates modal split based on local travel survey data.

Trip rates are based on a combination of ITE's Trip Generation, data from the San Francisco Citywide Travel Behavior Survey, and various environmental impact report traffic analyses. Different trip rates and modal splits are determined for four districts corresponding to "Superdistricts" in MTC's regional travel forecast model. Trip rates and modal split in unique situations (e.g. the redevelopment of the former Navy base on Treasure Island) are developed via negotiation between the City Planning Department and project proponents and their consultants.

As this tool is based on San Francisco survey data, including trip rates, mode choice and other elements, the method would not be directly applicable outside the City and County of San Francisco.

Analysis Triggers and Thresholds

The following checklist represents the Transportation Significance Criteria used in San Francisco to determine the need for a transportation impact analysis of a proposed development project.

1. The operational impact on signalized intersections is considered significant when project-related traffic causes the intersection level of service to deteriorate from LOS D or better to LOS E or F, or from LOS E to LOS F. [The operational impacts on unsignalized intersections are considered potentially significant if project-related traffic causes the level of service at the worst approach to deteriorate from LOS D or better to LOS E or F and Caltrans signal warrants would be met, or would cause Caltrans signal warrants to be met when the worst approach is already operating at LOS E or F.] The project may result in significant adverse impacts at intersections that operate at

LOS E or F under existing conditions depending upon the magnitude of the project's contribution to the worsening of the average delay per vehicle. In addition, the project would have a significant adverse impact if it would cause major traffic hazards or contribute considerably to cumulative traffic increases that would cause deterioration in levels of service to unacceptable levels.

2. The project would have a significant effect on the environment if it would cause a substantial increase in transit demand that could not be accommodated by adjacent transit capacity, resulting in unacceptable levels of transit service; or cause a substantial increase in delays or operating costs such that significant adverse impacts in transit service levels could result. With the Muni and regional transit screenlines analyses, the project would have a significant effect on the transit provider if project-related transit trips would cause the capacity utilization standard to be exceeded during the peak hour.
3. The project would have a significant effect on the environment if it would result in substantial overcrowding on public sidewalks, create potentially hazardous conditions for pedestrians, or otherwise interfere with pedestrian accessibility to the site and adjoining areas.
4. The project would have a significant effect on the environment if it would create potentially hazardous conditions for bicyclists or otherwise substantially interfere with bicycle accessibility to the site and adjoining areas.
5. A project would have a significant effect on the environment if it would result in a loading demand during the peak hour of loading activities that could not be accommodated within proposed on-site loading facilities or within convenient on-street loading zones, and created potentially hazardous conditions or significant delays affecting traffic, transit, bicycles or pedestrians.
6. The project would have a significant effect on the environment if it would result in inadequate emergency access.
7. Construction-related impacts generally would not be considered significant due to their temporary and limited duration.
8. The project would have a significant effect on the environment if it would result in a substantial parking deficit that could create hazardous conditions or significant delays affecting traffic, transit, bicycles or pedestrians and where particular characteristics of the project or its site demonstrably render use of other modes infeasible.

Mitigation Approaches

In 1981, the City enacted an ordinance imposing a **Transit Impact Development Fee** on new office development in the Downtown area of San Francisco. The TIDF was based on studies showing that the development of new office uses places a burden on the Municipal Railway, especially in the downtown area of San Francisco during commute hours, known as "peak periods." The TIDF was based on two cost analyses: one by the Finance Bureau of the City's former Public Utilities Commission, performed in 1981, and one by the accounting firm of Touche-Ross, performed in March 1983 to defend a legal challenge to the TIDF.

In 2000, the Planning Department, with assistance from the Municipal Transportation Agency, commissioned a study of the TIDF. The TIDF Study concluded that new non-residential uses in San Francisco will generate demand for a substantial number of auto and transit trips by the year 2020. The TIDF Study recommended that the TIDF be extended to apply to most non-residential land uses. The TIDF Study found that certain types of new development generate very few daily trips and therefore may not appropriately be charged a new TIDF.

The TIDF Study further recommended that the City enact an ordinance to impose transit impact fees that would allow MUNI to maintain its base service standard as new development occurs throughout the City. The proposed ordinance would require sponsors of new development in the City to pay a fee that is reasonably related to the financial burden imposed on MUNI by the new development. This financial burden is measured by the cost that will be incurred by MUNI to provide increased service to maintain the applicable base service standard over the life of such new development.

Subsequently, an update was completed in 2011, and in accordance with the applicable provisions of this Code, used updated data to calculate base service standard fee rates for the Economic Activity Categories subject to the TIDF. The Report also analyzed trip generation rates for these Economic Activity Categories using updated data, and divided the Retail/Entertainment and Cultural/Institution/Education categories into subcategories in order to reflect the comparative diversity of trip generation rates among these land uses.

Based on projected new development over the next 20 years, the TIDF will provide revenue to MUNI that is significant, but also significantly below the costs that MUNI will incur to mitigate the transit impacts resulting from the new development. The TIDF is considered by the City and County to be the most practical and equitable method of meeting a portion of the demand for additional Municipal Railway service and capital improvements for the City caused by new non-residential development.

Based on nexus studies performed, the City determined that the TIDF satisfies the requirements of the Mitigation Fee Act, California Government Code Section 66001, as follows:

(1) The purpose of the fee is to meet a portion of the demand for additional Municipal Railway service and capital improvements for the City caused by new nonresidential development.

(2) Funds from collection of the TIDF are used to increase revenue service hours reasonably necessary to mitigate the impacts of new non-residential development on public transit and maintain the applicable base service standard.

Where to next? The Transportation Sustainability Program and SB 743

Beyond transit impacts, many aspects of development impact and mitigation are currently subject to *ad hoc* negotiation. This situation is changing: A citywide Transportation Sustainability Fee (TSF) is being developed to offset the cumulative impacts of projects on the City's transportation network. The exact impact on the TIDF is unknown, while the TSF is undergoing finalization and its own environmental analysis.

The fee is a key component of the City's **Transportation Sustainability Program (TSP)**, which aims to modify the City's development review practices to ensure that development impacts to the transportation system are offset by improvements to the system as a whole, with a primary focus on

transit and multi-modal solutions. Development review and impact mitigation will thus better support the City’s longstanding [Transit First](#) policy.

The TSP plans to achieve this through the following two initiatives:

1. Changing how the City evaluates the effects of new development on the transportation system - emphasizing all modes of transportation - under the [California Environmental Quality Act](#) (CEQA); and
2. Establishing a citywide Transportation Sustainability Fee (TSF) to offset the cumulative impacts of projects on the City's transportation network.

These initiatives ensure that development review practices are consistent with the City’s policies and priorities, and that a development’s impact on San Francisco’s transportation system is fully offset through system improvements.

Figure SF-1: Transportation Sustainability Program Timeline

2003	<ul style="list-style-type: none"> • City stated goal to align development review with Transit First policy • SFCTA Board requested policy analysis of alternatives to auto Level of Service (LOS)
2007	<ul style="list-style-type: none"> • SFCTA recommended eliminating LOS and replacing it with an auto trip generation measure & mitigation fee
2009	<ul style="list-style-type: none"> • City initiated nexus study to determine relationship of projected development to transportation system impacts • City staff worked with State Resources Agency to revise CEQA guidelines: New language allows LOS or “an alternative measure”
2011	<ul style="list-style-type: none"> • TIDF Update Nexus Study completed
2012	<ul style="list-style-type: none"> • March 2012 – TSP Nexus Study completed • May 2012 – TSP Ordinance introduced • Environmental review on the TSP begins • TIDF update adopted with new fee rates, consistent with proposed TSP ordinance
2013	<ul style="list-style-type: none"> • SB743 adopted, which affects the Planning Department's analysis methodology with respect to aesthetics, parking and traffic
2014	<ul style="list-style-type: none"> • Ongoing outreach and engagement with stakeholders

**and
beyond**

- Ongoing environmental review on the TSP
- Legislation heard and adopted

Overview

Under the California Environmental Quality Act (CEQA), development projects being proposed must undergo environmental review. Currently, the primary way that a project's environmental effects on the transportation system are determined is by using a measure called Automobile Level of Service (LOS), which measures automobile delay at certain intersections or roadway segments. As a result, the environmental mitigations proposed to offset impacts identified using LOS are focused on improving automobile throughput. This is often infeasible in a dense, urban environment such as San Francisco. Oftentimes these mitigations are also in contradiction to the City's Transit First and other multimodal policies and priorities.

The City's Transit First policy recognizes the need to support all modes of transportation - including cars, buses, bikes and walking - to safely and effectively move people and goods around the City.

By eliminating Level of Service and replacing it with a measure that takes all modes of transportation into consideration, the environmental review can more accurately assess how a new development project affects the entire transportation system and can result in mitigations that support the entire transportation system, including transit, bikes, and pedestrians.

The City is currently preparing an Environment Impact Report (EIR) on the TSP. That EIR will analyze twenty years of projected development and its cumulative impact on transportation system performance. Once this analysis is completed and the program is adopted, individual development projects will no longer be required to conduct cumulative transportation studies as part of their environmental review, because those effects will already be known. And, by paying the Transportation Sustainability Fee, projects will mitigate their cumulative effects on the transportation system.

State Senate Bill 743 (SB 743) and San Francisco Transportation Impact Analysis and Fees

Concurrent with the development of the TSP, California passed [Senate Bill \(SB\) 743](#) in September 2013, meant to improve methods used to evaluate transportation impacts under CEQA, including Level of Service. With the passage of SB 743 the City's and the State's goals of reforming LOS have converged. Currently, the City is working with State regulators to ensure that any transportation significance standards developed by the City are consistent with the criteria being developed at the State level.

Transportation Sustainability Fee (TSF)

As noted above, the TSP proposes introducing a Transportation Sustainability Fee to help establish a means by which development projects can mitigate their impacts on the system. The proposed fee would supplement existing local transportation funding sources and would fund a \$1.4 billion expenditure program, over twenty years, shown to directly offset the impacts on the transportation system made by new development.

The TSF would replace or be a credit against payment of existing transit-related development fees such as the Transit Impact Development Fee (TIDF) and the Community Infrastructure Impact Fees if

applicable (e.g. Eastern Neighborhoods, Market and Octavia) in order to avoid double charging for transit impacts of new development. The TSF would apply to all land uses, except for single-family homes.

The TSP is the first program in San Francisco which integrates impact fees with the CEQA process such that paying the impact fee means that a project is mitigating its environmental impacts.

Transportation Sustainability Fee: Policy Credits Program

The proposed TSF includes a Policy Credits program to support desirable programs and/or policy outcomes by providing a reduction to or waiver from the fee. There is \$40 million in Policy Credits available over a twenty year period. The following types of projects are eligible for fee waivers or reductions under the Policy Credits program:

- **Small Businesses:** Non-formula retail small businesses expanding or occupying pre-existing commercial space not exceeding 5,000 gross square feet.
- **Reduced Parking Developments:** Projects will build less than the allowable maximum parking in zoning districts that set a parking maximum.
- **Affordable Housing Projects:** Projects that are affordable to a household at or below 80% of the Area Median Income; that are subsidized by the Mayor’s Office of Housing and/or the San Francisco Housing Authority; that are affordable for a term of at least 55 years; and that are not built as part of the Inclusionary Housing program.
- **Small Residential Projects:** Small residential projects comprised of 20 units or less.

Proposed Transportation Sustainability Fees

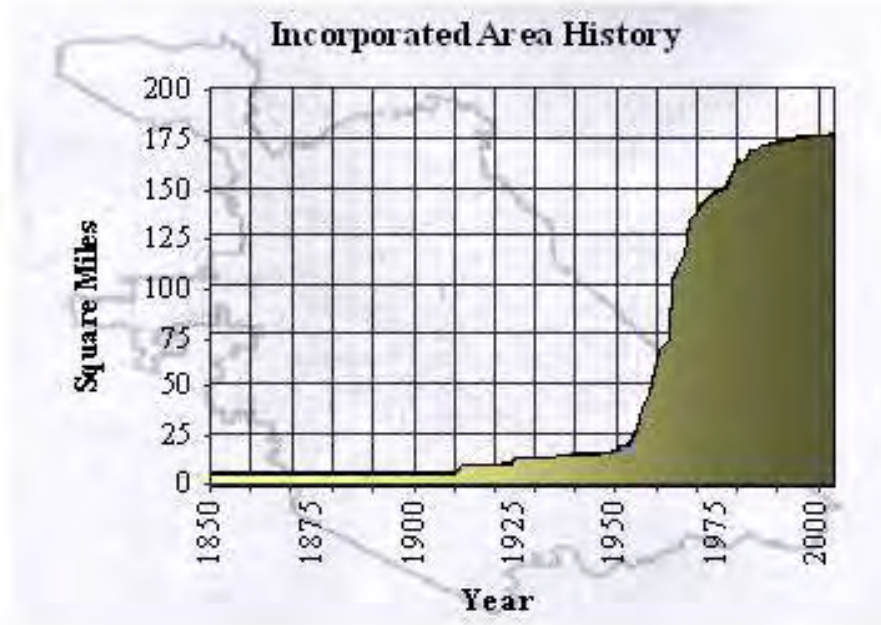
<i>Economic Activity Category</i>	<i>TSF Per Sq. Ft.</i>
RESIDENTIAL	
Residential – <i>generally, except for Senior Housing</i>	\$5.53
Senior Housing	\$3.79
NON-RESIDENTIAL	
Management, Information and Professional Services	\$12.64
Retail / Entertainment	\$13.30
Production, Distribution and Repair	\$6.80

Cultural / Institution / Education – <i>generally, except for Museum</i>	\$13.30
Museum	\$11.05
Medical and Health Services	\$13.30
Visitor Services	\$12.64

CITY OF SAN JOSÉ

Jurisdictional Context

San José is the largest city in the San Francisco Bay Area - larger than San Francisco in population and covering more than three times San Francisco's land area. The majority of growth in San José has occurred since World War II (see inset figure below) and most the City is oriented toward automobile transportation, though the City is served by both light rail and commuter rail as well as an extensive bus system. The Bay Area Rapid Transit District will extend service to San José in 2017.



Like Maryland, California is a “home rule” state, with strong local planning and zoning authority reserved for cities. Similarly to Montgomery County the land development and the transportation projects, goals, and objectives in the local General Plan and Regional Plans have a long-term horizons (20-25 years). Project-level

Environmental Review is coordinated by the Department of Public Works, Development Services division.

Like other jurisdictions in California, San José is subject to the provisions of SB 743, which amends statewide environmental impact guidelines to eliminate measures of motorist delay (including roadway Level of Service/LOS) in favor measures more directly related to greenhouse gas (GHG) emissions from motor vehicles, specifically vehicle trips (vt) and vehicle miles traveled (vmt). Guidelines for the implementation of SB 743 are still in draft form, and will not take full effect until late 2015.

San José City in a box

Population (2013)	998,537 – 1 million and growing
Population growth since 2010	4.8% -- growing
Jobs (2014 per BLS)	364,772 --
Geographic Area (sq. mi)	176.53 ~180 square

Metropolitan Area	San José MSA (Santa Clara Clara County); The Metropolitan Transportation Commission, MTC which works in tandem with the Association of Bay Area Governments (ABAG) as the MPO, covers 9 counties. The Census-defined San Jose-San Francisco-Oakland, CA Combined Statistical Area covers 11 counties (9 MPO counties plus San Joaquin and Santa Cruz Counties).
Relevant Resources and Sources	<p><i>San José Traffic Impact Analysis Handbook: Volume I – Methodologies & Requirements</i> (2009)</p> <p><i>San José Traffic Impact Analysis Handbook: Volume II – Policies and Guidelines</i> (2011)</p> <p>http://www.sanjoseca.gov/index.aspx?NID=3162</p>

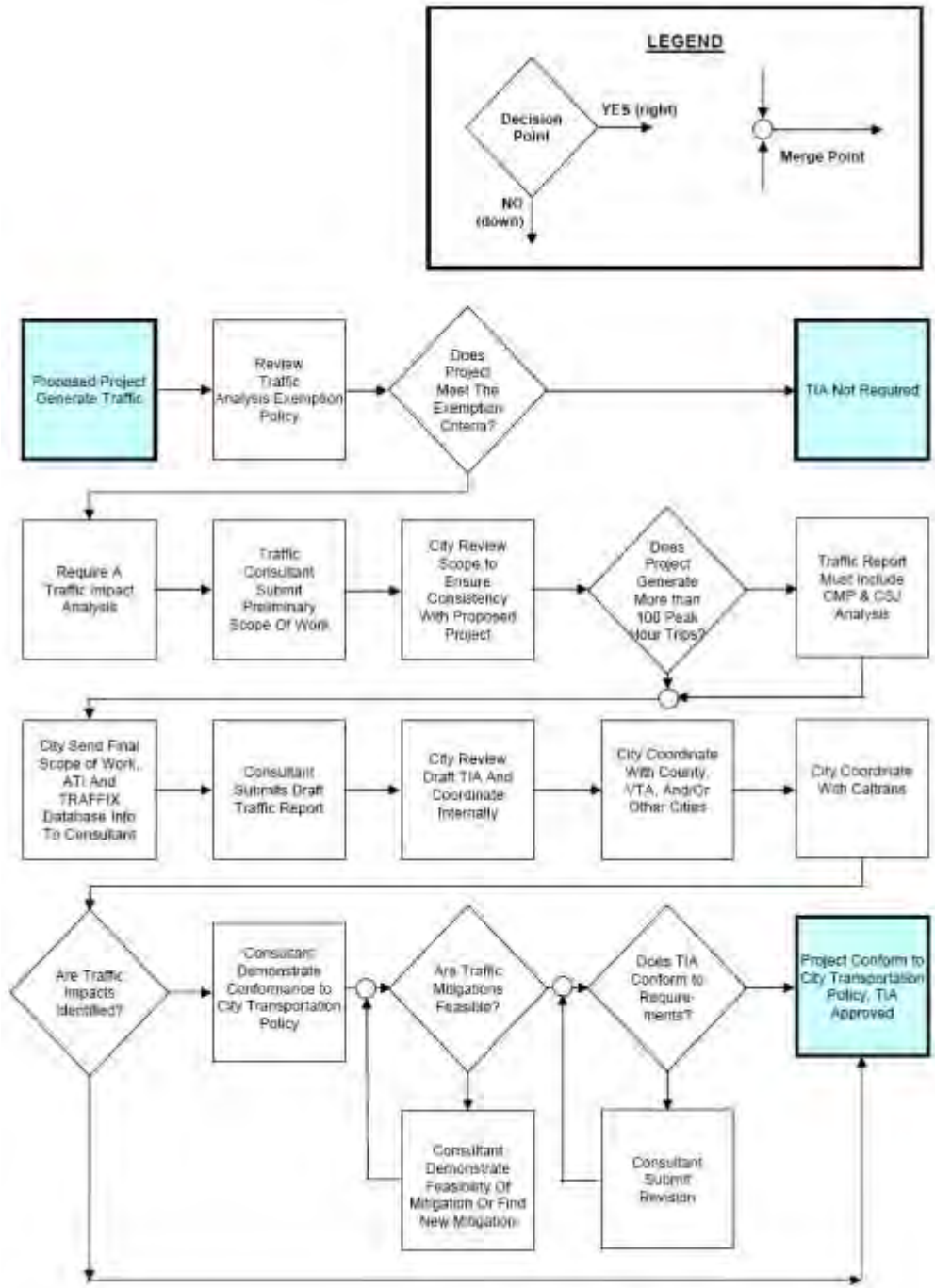
Development Impact Policy Tools

The City of San José relies on Traffic Impact Analysis (TIA) reports to ensure that new development projects comply with all applicable transportation policies and regulations. As part of the environmental review process, a TIA must be prepared in order to comply with the City of San José's transportation policy, any area development policy, and the Congestion Management Program which tracks and mitigates transportation effects at the County level. The TIA must identify the impact of the proposed development on the surrounding transportation network, as well as the specific development impacts and any required mitigation measures.

Typically, TIAs are prepared by a traffic consultant hired by the applicant. Development Services Division staff, working closely with the consultant, identify intersections to be studied and provide available existing and background information. Upon submittal of the completed traffic report and the traffic review fee to the city, staff will review the consultant's analysis to ensure compliance with the city's level-of-service (LOS) policy, any transportation policies unique to several identified subareas of the City (i.e., Evergreen, North San José, Edenvale), and the Congestion Management Program. After review, the TIA becomes part of the environmental documentation necessary for project approval.

The San José City Council adopted its current City Transportation Impact Policy on June 21, 2005 (Resolution 72765.1). This policy repealed and replaced previously adopted Council Policies 5-3, "Transportation Level of Service" and 5-4, "Alternate Traffic Mitigation Measures." The purpose of this Policy is to guide analyses and determinations regarding the overall conformance of a proposed development with the City's various General Plan multi-modal transportation policies, which together seek to provide a safe, efficient, and environmentally sensitive transportation system for the movement of people and goods.

The flow chart on the following page outlines the City of San José TIA process (Source: TIA Volume I report, Figure 7).



Traffic Level of Service

Level of Service is a measure of traffic congestion at signalized intersections. The standards used by the City of San José to measure the Level of Service within the areas subject to this policy are described in the following table.

Table SJ-1 - Levels of Service (LOS)

- LOS A Operations with very low delay occurring with favorable progression and/or short cycle length.
- LOS B Operations with low delay occurring with good progression and/or short cycle lengths.
- LOS C Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.
- LOS D Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.
- LOS E Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.
- LOS F Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.

The City's goal is to achieve an overall Level of Service of "D" at signalized intersections unless governed by an Area Development Policy or protected intersection designation. City staff shall determine the appropriate methodology for determining the Level of Service, and shall apply that methodology in a consistent manner.

Policy Implementation

Exempted Development Land Uses

The City Transportation Impact Policy applies to all developments within the applicable geographic areas, except the following types of infill projects that shall be exempted from this Policy, because the Council finds that these projects, individually and cumulatively, will not cause a significant degradation of transportation Level of Service and the subject projects will further other City goals and policies:

- a) All retail commercial buildings containing 5,000 square feet of gross area or less.
- b) All office buildings containing 10,000 square feet of gross area or less.
- c) All industrial buildings of 30,000 square feet or less.
- d) All single-family detached residential projects of 15 dwelling units or less.
- e) All single-family attached or multi-family residential projects of 25 units or less.

In no case are any of these above types of infill projects exempted if they are increments of a larger project or parcels.

Significant LOS Impacts

A significant LOS impact occurs when the TIA demonstrates that the proposed development would cause the Levels of Service at an intersection to fall below LOS D with the addition of project traffic to baseline conditions. For intersections already operating at unacceptable LOS (E or F) under the baseline condition, a significant impact is defined as the proposed project causing:

- An increase in average critical delay value by 4.0 seconds or more and an increase in the critical V/C ratio of 0.010 or more, or
- A decrease in average critical delay and an increase in the critical V/C ratio of 0.010 or more.

When a significant impact occurs, the TIA must also identify improvements that would reduce traffic congestion so that the intersection operates at the level that would occur without the proposed project.

Mitigation for LOS Impacts

The proposed development is required to construct all LOS Traffic Improvements identified in the TIA as necessary to mitigate the significant LOS impacts, unless the TIA demonstrates that these improvements would have an unacceptable impact on other transportation facilities (such as pedestrian, bicycle, and transit systems and facilities). An improvement has an unacceptable secondary impact if the TIA demonstrates that the improvement would result in a physical reduction in the capacity and/or a substantial deterioration in the quality (aesthetic or otherwise) of any other planned or existing transportation facilities. The following are examples of the kinds of secondary impacts that would be considered unacceptable:

- Reducing the width of a sidewalk below minimum city standard
- Eliminating a bicycle lane or reducing its width below city standard
- Eliminating a bus stop or eliminating a parking lane that accommodates a bus stop
- Eliminating a park strip (landscaped area between sidewalk and street) that contains mature trees
- Encouraging substantial neighborhood cut-through traffic
- Creating unsafe pedestrian and/or automobile operating conditions

Context-Sensitive Variance: Exception Areas and Protected Intersections

Downtown Area General Plan Policy: In recognition of the unique position of the Downtown Core Area as the transit hub of Santa Clara County, and as the center for financial, business, institutional, and cultural activities, development within the Downtown Core Area Boundary is exempted from traffic mitigation requirements. Intersections within and on the boundary of this area are also exempted from the Level of Service "D" performance criterion.

The City of San José has also identified certain local intersections for which no further vehicle capacity improvements are planned. These intersections are built to their maximum capacity, where further expansion would cause significant adverse effects upon existing or approved transit or other multimodal facilities, nearby land uses, or local neighborhoods. Future infill development that is otherwise consistent with other General Plan policies encouraging Smart Growth may, therefore, generate additional traffic through these intersections, resulting in a level of congestion that would not otherwise be consistent with the rest of the City Transportation Impact Policy. A list of Protected Intersections, which is revised from time to time, is maintained by the City. (See Appendix A of the TIA Volume I report).

Congestion Management Agency (Subregional Impact Analysis)

The Santa Clara Valley Transportation Authority (VTA) is the Congestion Management Agency (CMA) for Santa Clara County. The VTA maintains LOS guidelines and TIA guidelines that provide a uniform method for evaluating the impacts of land use decisions affecting the Congestion Management Program (CMP) system. These guidelines are presented in the Congestion Management Program Traffic Level of Service Analysis Guidelines adopted in March, 2003, and Transportation Impact Analysis Guidelines adopted in March, 2009.

The VTA requires all local jurisdictions to conform to the CMP TIA guidelines to evaluate the transportation impacts of all land use decisions within the Member Agency's jurisdiction that are projected to generate 100 or more AM or PM weekday peak-hour trips. Any non-conformance issues in the TIA should be identified and clearly presented. While the VTA's TIA guidelines provide a basis for analysis, the City of San José's TIA guidelines differs from the VTA's guidelines.

The primary difference between the VTA TIA guidelines and the City of San José guidelines is the minimum Levels of Service threshold that is required of each jurisdiction. VTA requires a minimum LOS E while the City requires LOS D. Therefore, it is possible for an intersection to be operating at a deficient Levels of Service (or to have an impact) according to the City of San José's criteria but not the VTA's. The VTA guidelines do not include exception areas but do the establishment of a deficiency plan for impacts that cannot be fully mitigated.

North San José Area Development Policy Area TIA and Traffic Fee Requirements

The employment-rich North San José (NSJ) Policy area boundaries include the area within San José north and west of Interstate 880 or the Coyote Creek, east of the Guadalupe River and south of State Route 237. The Policy area also includes an area east of Interstate 880 along Murphy Avenue as far as Lundy Avenue. The Policy was revised in 2005 to address the potential impacts of developing an additional 26.7 million square feet of industrial use, 1.7 million square feet of supporting commercial use, and 32,000 residential units within the Policy area.

The specific traffic impacts of this amount of new development have been analyzed and described in the traffic analysis and Environmental Impact Report (EIR) prepared for the Policy. The Policy also includes mitigation measures identified for these impacts and establishes a mechanism for the implementation of these mitigation measures. Typically, any new development in the area that falls within the parameters of the Policy should not require additional review of traffic impacts, but may require additional analysis to address site operational issues. To be consistent with the traffic analysis included within the EIR, new projects must include design features and programs that support multi-modal commute choices including provision of bicycle and pedestrian facilities and incorporation of transportation demand management (TDM) measures.

The City has implemented a Traffic Impact Fee (TIF) program to fund mitigation measures needed to accommodate future traffic conditions resulting from implementation of the NSJ Policy as described in the traffic analysis and EIR. The TIF is assessed on all new residential and industrial development within the Policy area and shall be collected at issuance of Building Permits. Fees will only be levied for new development beyond existing development rights.

The TIF equitably distributes the cost of the necessary infrastructure improvements on a cost per trip generated basis amongst the total development addressed through the NSJ Policy (e.g., 26.7 million square feet of office/industrial/ supporting retail development and 32,000 residential units). The fee initially was set at \$10.44 per square foot for all new industrial/office/R&D development, at \$6,994 per unit for new single-family residences, and at \$5,596 per unit for new multi-family residences. These fees are adjusted automatically every two years according to the policy and will be reviewed every five years to account for changes in construction costs and/or inflation.

Washington, DC

Jurisdictional Context

The Washington, DC planning and zoning requirements are perhaps unique simply due to the jurisdiction's status as a federal district in which most administrative functions must serve to some degree both "statewide" and a local jurisdiction purposes. The Zoning Commission approves development review with support from the District of Columbia Office of Zoning (DCOZ).

Transportation impact analysis regulations are reviewed by the District Department of Transportation (DDOT), and the rules and regulations for these analyses are evolving. Chapter 45 of the DDOT Design and Engineering Manual contains "Requirements for Traffic Impact Studies for Development Projects" and in January 2012, DDOT published a beta version of the new DDOT Guidelines for Comprehensive Transportation Review (CTR) Requirements. The shift from Chapter 45 to the CTR requirements is described in the TRB paper by Sam Zimbabwe et al, at the TRB 2013 Annual Meeting and available upon request. The CTR document is the focus of this literature review; in some cases the evolution between the two documents is described.

Washington DC in a box

Population (2013)	646,449
Population growth since 2010	7.4%
Jobs (2014 per BLS)	634,183
Geographic Area (sq mi)	61.05
Metropolitan Area	Washington-Arlington-Alexandria, DC-MD-VA-WV
Relevant Resources	DDOT Development Review http://ddot.dc.gov/page/development-review
Current procedure adoption dates	DDOT Chapter 45 – Requirements for Traffic Impact Studies for Development Projects http://dcps.dc.gov/DC/DDOT/Publication%20Files/Projects%20and%20Planning/Standards%20and%20Guidelines/publication_design_and_engineering_ch45_ddot.pdf DDOT Guidelines for Comprehensive Transportation Review (CTR) Requirements (August 2012 beta version) http://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/ddot_comprehensive_transportation_review_requirements_2012.pdf

Development Impact Policy Tools

The District of Columbia uses the Comprehensive Transportation Review (CTR) process as a single holistic approach for addressing site impacts on the transportation network.

Context-Sensitive Variance

The District of Columbia is entirely urban in nature, although the level and type of development density is controlled by a series of different zones. The transportation requirements therefore apply citywide. CTR requirements for different types of modal analysis are derived primarily through the level of site person trips to be generated by mode, and secondarily through the relationship of the site to the transit network and in some cases the level of on-street parking availability.

Local Area Transportation Review

Analysis Tools and Thresholds

The draft CTR requires a series of analysis thresholds for different multimodal effects. Auto traffic analysis Intersection analysis is triggered by generation of 50 peak hour *person-trips*, or by an increase of 5,000 commercial square feet, 20 dwelling units, or a demand for 20 parking spaces.

Additional Motor Vehicle Analysis

Additional motor vehicle analysis is triggered if the site will generate at least 25 peak hour auto trips in the peak direction to or from the site. For motor vehicle travel, the CTR identifies a citywide intersection congestion standard of LOS E, as defined by the Highway Capacity Manual as <80 seconds of vehicle delay (less stringent than the LOS D requirement in Chapter 45). Mitigation is required if the site traffic causes a study intersection to cross the LOS E/F threshold, creates an increase of at least 5 seconds per vehicle, increases queue lengths by more than 150 feet, or does not meet district goals for mode share, or increases VMT or greenhouse gas emissions.

In addition to intersection delay, the CTR must address site access/loading for deliveries (and motorcoaches if applicable), and on-street parking supply/occupancy within a 5 minute walk if the site will add 40 off-street vehicle parking spaces.

Additional Bicycle and Pedestrian Analysis

Additional bicycle and pedestrian network analysis is triggered if the site encompasses at least 50,000 commercial square feet, 200 residential units, 100 or more pedestrian/bicycle trips, or a site encompassing more than a typical street grid block. Applicants need to estimate AM and PM inbound and outbound peak hour motor vehicle, bicycle, and transit/pedestrian volumes to determine which trip thresholds may apply.

Bicycle parking demand is to be estimated regardless of the development size.

Additional Transit Capacity Analysis

Additional transit system analysis is triggered if the site will generate at least 50 peak hour transit trips or if the transit mode share exceeds 30%. Transit analysis considers all bus/streetcar stops within a one-quarter mile radius and all Metrorail stations within a one-half mile radius. An analysis must address transit capacity for any site that will generate 30 peak hour bus/streetcar trips to a line that has peak hour headways greater than 20 minutes.

TDM Plan

A TDM Plan is required if the site will generate at least 50 peak hour vehicle trips or request variances in minimum parking requirements by either 10% or 20 spaces. If the site generates at least 200 peak hour vehicle trips, the TDM Plan must be accompanied by a monitoring program with a commitment to increase TDM actions if the site's mode share goals are not met.

Safety

The applicant needs to contribute to the mitigation of any existing safety deficiencies, using techniques in the Highway Safety Manual, if the site will generate a substantial increase in pedestrian and bicycle exposure (thereby creating an expectation of increased crashes).

Mitigation Approaches

The CTR guidelines facilitate mitigation of development impacts through a variety of approaches, with DDOT staff exercising a high degree of autonomy in negotiating an appropriate mitigation approach:

- Vehicle trip reduction can be achieved through parking reduction and other elements in the TDM Plan
- Bicycle and pedestrian impact mitigation can be achieved through improvements to the sidewalk and bikeway network. A validated traffic simulation may be needed to demonstrate the efficacy of the proposed improvement, including effect on delay to other modes of travel.
- Transit impact mitigation can be achieved through additional transit information features such as wayfinding and bus stop improvements, following WMATA's guidance on improvement priorities.
- Vehicular impact mitigation can be achieved through geometric changes or other measures, but must not add significant delay to other modes.

Areawide Review

The District of Columbia does not have an areawide review process.

Transportation Impact Tax

The District of Columbia does not have a transportation impact tax or fee, although they are considering establishment of an impact fee as described below.

Where to Next?

DDOT is exploring District-specific, context-sensitive trip generation rates as well as development impact fees as alternatives to either complement or replace elements in the beta version of the CTR.

DDOT is also exploring trip caps or parking caps as a means to assess transportation impacts, particularly in the most developed areas of the city where shared parking has the greatest utility and identification of either person-trip or vehicle-trip assignment to an individual site is the most challenging and costly. The concept for such an application in the Navy Yard/Ballpark area is described in a paper by Jamie Henson et al, presented at the 2014 TRB Annual Meeting and available upon request.

Broward County, FL

Jurisdictional Context

The Broward County Land Development Code sets forth the system for complying with the State requirements for transportation concurrency, for developments seeking approvals by the County. Each municipality also has regulations governing development requests it may approve. The County Commission has authority for plat approval countywide, and for approval of site plans and building permits in the unincorporated area. Broward County does not approve building permits and site plans within municipalities.

Broward County in a box

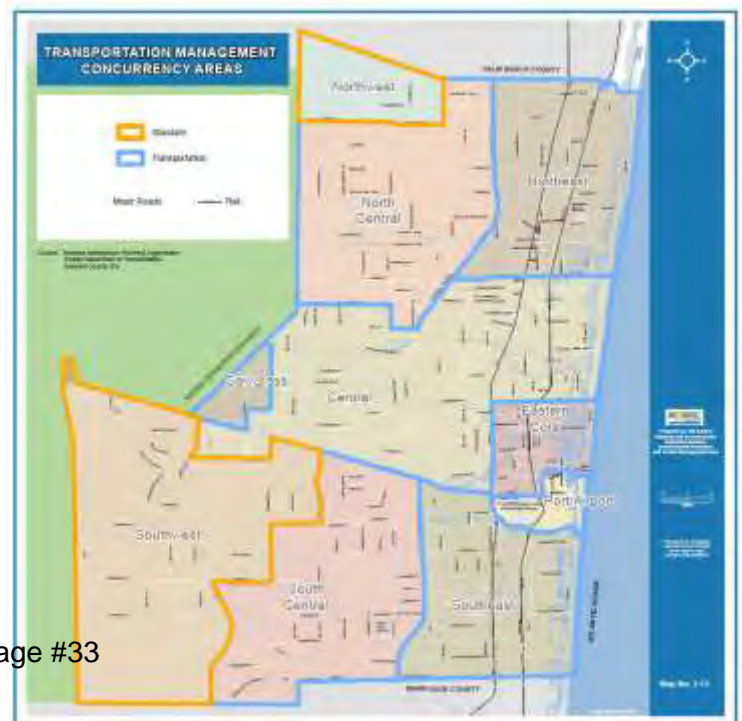
Population (2013)	1,833,844
Population growth since 2010	5.2%
Jobs (2014 per BLS)	731,928
Geographic Area (sq mi)	TBD
Metropolitan Area	Miami-Fort Lauderdale-West Palm Beach
Relevant Resources	Concurrency Process http://www.broward.org/Regulation/Development/Pages/TrafficConcurrency.aspx Concurrency Fees http://www.broward.org/Regulation/Development/Pages/ImpactandConcurrencyFees.aspx
Current procedure adoption dates	

Development Impact Policy Tools

In Broward County, individual municipalities handle **local area** transportation impact studies according to the rules and regulations in each municipality. Broward County uses an **areawide system** to assess overall network Transportation Concurrency to assess transportation system adequacy and separate **road impact fees** to handle hookup costs to the regional system..

Two (2) of these districts (Northwest and Southwest Districts – shown with orange boundaries on Map 3-13) maintain the existing roadway concurrency system. These are areas of the County where roadway capacity is expected to be the predominant form of transportation capacity enhancement.

The remaining eight (8) districts are designated as Transportation Concurrency Districts, where funds raised from the concurrency process are directed toward transit improvements. The



District boundaries, as well as the transit improvements within the districts, are the result of extensive consultations with the municipalities. Transportation Concurrency assessments are based on a five-year Transit Development Plan (TDP) adopted by the County Commission. The Transportation Concurrency Assessment is calculated as the total peak-hour trip generation of the proposed development, multiplied by a constant dollar figure for each District, that represents the cost per trip of all the TDP enhancements in that District. The revenues from Transportation Concurrency Assessments must be used to fund transit enhancements in the District.

Transportation Concurrency

Analysis Tools and Thresholds

In considering concurrency for the two Roadway Concurrency Districts, the capacity of each link of the regional roadway system is compared to the sum of:

- The actual traffic on the road
- The projected traffic from approved, unbuilt developments; and
- The projected traffic from the proposed development.

If this total traffic exceeds the road's capacity, the road is considered over capacity and a "traffic impact area" is created around the proposed development with a radius between 1-3 miles depending on use:

- Commercial larger than 1 million sq feet = 3 miles
- Commercial between 200,000-1 million sq feet, all office, industrial, and regional parks = 2 miles
- All residential = 1.5 miles
- All other uses = 1 mile

Each of the eight Transportation Concurrency Districts has identified context-sensitive transit LOS requirements as follows:

- Northeast District - Maintain headways of 30 minutes or less on 90% of routes; reduce traffic signal communication failures by 50%; increase peak-hour weekday transit ridership by 17%
- North Central District – Maintain headways of 30 minutes or less on 90% of routes, Increase peak-hour transit ridership by 23%
- Central District - Maintain headways of 30 minutes or less on 80% of routes, reduce traffic signal communication failures by 50%; increase peak-hour weekday transit ridership by 19%
- Port/Airport District – Increase peak-hour weekday transit ridership by 20%
- Eastern Core District - Maintain headways of 30 minutes or less on 90% of routes; Maintain headways of 20 minutes or less on 40% of routes; reduce traffic signal communication failures by 50%; increase peak-hour weekday transit ridership by 19%
- Sawgrass District - Maintain headways of 15 minutes or less on 50% of routes; increase peak-hour weekday transit ridership by 22%
- Southeast; Increase peak-hour weekday fixed-route transit ridership by 24%

- South Central District - Maintain headways of 30 minutes or less on 80% of routes. Establish and maintain service at one or more neighborhood transit centers. Increase peak-hour weekday fixed-route transit ridership by 22%

Road Impact Fees

Broward County has a separate road impact fee system.


Road Impact Fee Schedule
 Environmental Protection and Growth Management Department
 Planning and Redevelopment Division
 Cost Per Trip Per Zone by Land Use Category
 Effective October 1, 2013

ZONE	Residential	Office	Industrial	Commercial
1	\$1,802	\$1,864	\$1,790	\$1,871
2	\$328	\$379	\$416	\$328
3	\$579	\$646	\$693	\$612
4	\$800	\$884	\$908	\$864
5	\$1,081	\$974	\$1,029	\$957
6	\$314	\$363	\$346	\$330
7	\$737	\$860	\$890	\$847
8	\$66	\$132	\$155	\$111
9	\$63	\$100	\$124	\$80
10	\$106	\$125	\$153	\$102
11	\$145	\$145	\$170	\$118

Baltimore, MD

Jurisdictional Context

The Baltimore Planning Commission approves private development in the City of Baltimore. The Baltimore City Department of Transportation is in charge of managing the transportation impact analysis process.

Sample County in a box

Population (2013)	622,104
Population growth since 2010	0.2%
Jobs (2014 per BLS)	372,055 (County) 325,608 (City)
Geographic Area (sq mi)	80.94
Metropolitan Area	Baltimore-Columbia-Towson, MD
Relevant Resources	Traffic Impact Studies http://archive.baltimorecity.gov/Government/AgenciesDepartments/Transportation/Planning/TrafficImpactStudies.aspx
Current procedure adoption dates	Procedures and Requirements for Conducting A Traffic Impact Study in Baltimore City Pursuant to Ordinance 06-0345 (August 2007) http://archive.baltimorecity.gov/Portals/0/agencies/transportation/public%20downloads/2010/Baltimore%20City%20Traffic%20Impact%20Study%20Final%20Guidelines.pdf Rules and Regulations for Traffic Mitigation in the City of Baltimore (October 2012) http://archive.baltimorecity.gov/Portals/0/agencies/transportation/public%20downloads/traffic%20mitigation%20regulations.pdf

Development Impact Policy Tools

Baltimore uses two complementary processes to mitigate transportation impacts of development:

- Within a Traffic Mitigation Zone, payment of a fee
- Outside a Traffic Mitigation Zone, completion of a Traffic Impact Study

Context-Sensitive Variance

Local Area Transportation Review

Pursuant to Ordinance 06-0345 as amended by Ordinance 11-529, development projects of a



certain size must be reviewed by the Department of Transportation to determine if traffic impact study and/or mitigation is required. The purpose of traffic mitigation is to provide for certain development projects to mitigate their impacts on the City's intermodal transportation network. The mitigation impacts are evaluated in one of two ways: for projects located inside a Traffic Mitigation Zone the mitigation is provided by payment of a fee; and, outside of the Traffic Mitigation Zone a Traffic Impact Study may be required in order to evaluate the impact.

Analysis Tools and Thresholds

A Traffic Impact Study is required if for any proposed development greater than 15,000 square feet of gross floor area, if the proposed development involves any of the following:

- an impact area (as determined by BCDOT) with an intersection operating at LOS D or worse,
- 100 dwelling units, or
- 150,000 square feet of warehouse or 50,000 square feet of any other use.

The latest versions of ITE Trip Generation, Highway Capacity Manual, and other MDOT procedures are acceptable and Synchro is a preferred analysis tool for signalized intersections with HCM or Sidra used for unsignalized intersections or roundabouts. Additional data sources, such as census journey-to-work data or information on employee home zip codes and transit subsidies, may be used. Trip adjustment factors may be provided by the Baltimore Metropolitan Council to adjust ITE trip generation rates to account for transit and non-motorized travel.

Pedestrian and bicycle level of service, transit boarding/alighting and level of service, and other operational and safety analyses may be required on a case-by-case basis at the discretion of BCDOT.

An acceptable level of service is LOS D or better, unless the intersection is already congested, in which case the level of service should be no worse than without the site generated traffic.

Mitigation Approaches

Mitigation approaches may include roadway improvements, transit/bicycle/pedestrian improvements, TDM improvements, or a monetary contribution to fund capital or operating costs for roadway, transit, or infrastructure improvements.

Areawide Review

Transportation Impact Tax

Where to Next?

Gaithersburg, MD

Jurisdictional Context

Gaithersburg, Maryland is an incorporated municipality in Montgomery County, but has independent planning and zoning authority from the unincorporated portions of the County. The Planning Commission is the development approval authority. Maryland is a “home rule” state, with strong local planning and zoning authority.

The City of Gaithersburg's Planning and Code Administration Department has oversight of the development process. Any development or redevelopment must comply with the City's Adequate Public Facilities Standards as set forth in Section 24-257 of the Zoning Ordinance.

Sample County in a box

Population (2013)	65,690
Population growth since 2010	9.7%
Jobs (2014 per BLS)	36,962
Geographic Area (sq mi)	10.2
Metropolitan Area	Washington-Arlington-Alexandria, DC-MD-VA-WV
Relevant Resources	Adequate Public Facilities Ordinance (Section 24 Article XV) http://www.gaithersburgmd.gov/services/planning-services/adequate-public-facilities
Current procedure adoption dates	Traffic Impact Study Standards and Regulation (May 2012) (no hotlink available; download from APFO page noted above)

Development Impact Policy Tools

The City of Gaithersburg uses a three-tiered approach to development exactions:

- A **transportation impact tax** covers the basic “hookup” costs to the transportation system; the tax is the same as Montgomery County’s development impact tax
- A **Traffic Impact Study (TIS)** process identifies transportation deficiencies based on conditions proximate to the development site.

Context-Sensitive Variance

The City allows a greater number of vehicle trips to be reduced through travel demand management (TDM) facilities and services, or by provision of other non-auto facilities, if the site is in the Central Business District (CBD)

Comprehensive Transportation Review

Analysis Tools and Thresholds

Development generating 30 more peak hour trips must submit a Traffic Impact Study; the same threshold as in Montgomery County. The assessment of transportation system adequacy is analytically based primarily on intersection capacity using the critical lane volume (CLV) method, with a translation to volume-to-capacity ratio (V/C) and level of service (LOS). The estimated vehicle trips generated by a proposed development are compared to the Citywide 1450 CLV standard to evaluate likely future congestion. The development's trips that contribute to nearby intersections exceeding the standard must be mitigated in some fashion.

Mitigation Approaches

For all developments submitting a CTR, mitigation of CLV impacts requires achieving at least one of the following two objectives:

- Bringing an unacceptable intersection CLV down to the Policy Area standard, or
- Mitigating a portion (generally up to half) of the development's CLV impact at locations where an intersection CLV is already well in excess of the congestion standard

The City allows applicants to take vehicle trip credits of up to 10% of total vehicle trips generated (15% in the CBD) for entering into a binding Trip Mitigation Agreement (TMA). A TMA allows the applicant to take credit for providing or funding several TDM elements or services, including transit/shuttle services, park-and-ride lots, transit queue jumpers or signal priority treatments, parking management, and live-near-your-work programs.

The City allows applicants to take vehicle trip credits of up to 10% of total vehicle trips generated (15% in the CBD) for providing non-automobile amenities. The value of those amenities are gauged using the City of Rockville's Comprehensive Transportation Review processes (see Rockville, MD review).

Areawide Review

The City of Gaithersburg does not have an areawide review process.

Transportation Impact Tax

The City of Gaithersburg has planning and zoning authority independent from Montgomery County, but the collection of development impact taxes falls under the County's purview. Taxes collected in the City of Gaithersburg are maintained in a separate account for the purposes of considering both allocation of tax revenues to fund proximate transportation improvements as well as for the purposes of considering impact tax credit applications from developers.

Where to Next?

Rockville, MD

Jurisdictional Context

Rockville, Maryland is the County seat of Montgomery County, but has independent planning and zoning authority from the unincorporated portions of the County. The Planning Commission is the development approval authority. Maryland is a “home rule” state, with strong local planning and zoning authority.

The City of Rockville's Community Planning and Development Services has oversight of the development process. Any development or redevelopment must comply with the City's Adequate Public Facilities Standards as set for the in Article 20 of the Zoning Ordinance. The Department of Public Works Traffic and Transportation Division has oversight over the Comprehensive Transportation Review (CTR) methodology for determining the need for an "Initial" Transportation Report or a full Transportation Report (TIS). The process for traffic review study procedures is undertaken about once every five years.

Sample County in a box

Population (2013)	64,072
Population growth since 2010	4.5%
Jobs (2014 per BLS)	66,450
Geographic Area (sq mi)	13.51
Metropolitan Area	Washington-Arlington-Alexandria, DC-MD-VA-WV
Relevant Resources	Comprehensive Transportation Review http://www.rockvillemd.gov/index.aspx?nid=691 Development Impact Fee Study http://www.rockvillemd.gov/documentcenter/view/2163
Current procedure adoption dates	Development Review Procedures Manual (June 2013) http://www.rockvillemd.gov/DocumentCenter/View/549 Comprehensive Transportation Review (March 2011) http://www.rockvillemd.gov/DocumentCenter/View/457

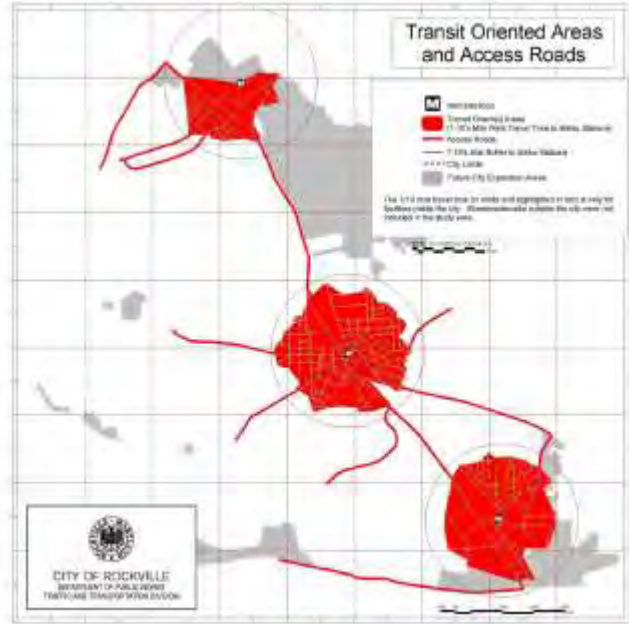
Development Impact Policy Tools

The City of Rockville uses a three-tiered approach to development exactions:

- A **transportation impact tax** covers the basic “hookup” costs to the transportation system; the tax is the same as Montgomery County’s development impact tax
- A smaller **transportation impact fee** covers additional non-auto-oriented improvements and TDM services within the City
- A **Comprehensive Transportation Review** process identifies transportation deficiencies based on conditions proximate to the development site.

Context-Sensitive Variance

The City has identified Transit Oriented Areas (TOA) an Access Roads that are proximate to and serve the three Metrorail stations in the City. The acceptable level of traffic congestion is higher in TOAs and their Access Roads than they are elsewhere in the City.



Comprehensive Transportation Review

Analysis Tools and Thresholds

Development generating 30 more peak hour trips must submit Comprehensive Transportation Review (CTR) study; the same threshold as in Montgomery County. Office development generating 125 or more trips must also develop a Trip Reduction Plan to identify and implement transportation demand management (TDM) strategies. Any development generating 350 or more trips must also complete a Multimodal Analysis.

The assessment of transportation system adequacy is analytically based primarily on intersection capacity using the critical lane volume (CLV) method, with a translation to volume-to-capacity ratio (V/C) and level of service (LOS). The estimated vehicle trips generated by a proposed development are compared to the applicable policy area standard to evaluate likely future congestion. Intersection LOS thresholds are based on functional class of the two intersecting streets. In general, business district streets and major highway junctions are adequate at LOS E; other non-residential streets are adequate at LOS D, and residential streets are adequate at LOS C.

The development’s trips that contribute to nearby intersections exceeding the standard must be mitigated in some fashion. Table 4 indicates the intersection impact thresholds which include two quantitative criteria related to intersection V/C and residential street volume, and four qualitative criteria related to traffic control devices, design standards, and multimodal safety hazards. Synchro may be used in some cases to examine operational concerns.

Table 4: General Intersection Impact Thresholds	
1.	A deterioration in intersection LOS by one level (0.10 v/c, a full one percent) or greater
2.	Automobile trips that cause the City’s criteria for acceptable traffic volumes on residential streets to be exceeded, as outlined in the Master Plan
3.	Contributing significantly toward the need for, or modification of, a traffic signal or other traffic control devices as established in the <u>Manual on Uniform Traffic Control Devices</u> or determined by the Director of Public Works or designee
4.	Exceeding the capacity of a turn lane as established in the Policy on Geometric Design of Highways and Streets (AASHTO) or determined by the Director of Public Works or designee
5.	Contradicting principles of proper design and location for driveways, medians and median openings, service drives, and similar facilities
6.	Any condition creating or aggravating a safety hazard for motorists, pedestrians, or bicyclists

Mitigation Approaches

For all developments submitting a CTR, mitigation of CLV impacts requires achieving at least one of the following two objectives:

- Bringing an unacceptable intersection CLV down to the Policy Area standard, or
- Mitigating a portion (generally up to half) of the development's CLV impact at locations where an intersection CLV is already well in excess of the congestion standard

Office developments generating at least 125 peak hour vehicle trips must develop a **Trip Reduction Plan** using the City's Trip Reduction Tool, a web-based application that identifies an appropriate trip reduction range and allows applicants to craft their own plan through a combination of strategies that result in a specific point total being achieved. The Trip Reduction Plan includes a commitment to monitoring conditions for 10 years after occupancy and until the trip reduction goals have been met for three consecutive years. Financial penalties can be assessed for failure to meet the trip reduction goals.

Development generating at least 350 peak hour vehicle trips must complete a **Multimodal Analysis** and provide a **Transportation Improvement Contribution**. The goal of the Transportation Improvement Contribution is to address deficiencies both within and beyond the site, based on multimodal connectivity gaps identified in the Multimodal Analysis. The City identified high priority projects from its citywide Sidewalk Prioritization Policy and Complete Streets Policy as part of its 2012-2016 TDM Plan. <http://www.rockvillemd.gov/documentcenter/view/591>

Areawide Review

The City of Rockville does not have an areawide review process.

Transportation Impact Tax

The City of Rockville has planning and zoning authority independent from Montgomery County, but the collection of development impact taxes falls under the County's purview. Taxes collected in the City of Rockville are maintained in a separate account for the purposes of considering both allocation of tax revenues to fund proximate transportation improvements as well as for the purposes of considering impact tax credit applications from developers.

Transportation Impact Fee

Developments generating 30 weekday peak hour vehicle trips or more are required to pay a one-time Transportation Impact Fee as identified in the Development Review Procedures Manual. The revenues from this fee (\$1.50 per commercial square foot or \$900 per multi-family dwelling unit) is used to implement multimodal improvements throughout the City, provide transportation information and services to employers and commuters in the City, and to monitor employer Trip Reduction Plans to ensure compliance with trip reduction goals. The fee is not available for projects that increase automobile capacity.

Where to Next?

The City of Rockville conducted an analysis of alternative transportation capacity review procedures as part of the MWCOC Transportation-Land Use Connections program in 2013, with a focus on development projects with regional impacts (those extending beyond the city limits). The analysis recommended the City explore several concepts being applied in Montgomery County (including Highway Capacity Manual analysis to supplement CLVs for congested intersections, development of more formal parking management districts and transportation demand management districts, updating LATR vehicle trip generation rates to improve context-sensitivity). The report also recommends exploring a cap-and-trade program for either vehicle trips or parking spaces.

<http://www.mwcog.org/transportation/activities/tlc/pdf/Rockville-Dev-Pres.pdf>

<http://www.mwcog.org/transportation/activities/tlc/pdf/Rockville-Dev.pdf>

Alexandria, VA

Jurisdictional Context

The Department of Planning and Zoning leads the development review process and the Transportation Division of the Transportation and Environmental Services (T&ES). Virginia is a “Dillon Rule” state with a strong role of state government in the transportation impact analysis process and a practice of negotiated proffers rather than formulaic exactions.

Sample County in a box

Population (2013)	148,892
Population growth since 2010	6.4%
Jobs (2011 per OntheMap)	93,932
Geographic Area (sq mi)	15.03
Metropolitan Area	Washington-Arlington-Alexandria, DC-MD-VA-WV
Relevant Resources	Transportation Management Plans http://alexandriava.gov/tes/info/default.aspx?id=6556
Current procedure adoption dates	VDOT Traffic Impact Analysis Regulations (January 2012) http://www.virginiadot.org/projects/resources/chapter527/Traffic_Impact_Analysis_Regulations_24VAC30-155_1.2012.pdf Transportation Planning Administrative Guidelines (March 2013) http://alexandriava.gov/uploadedFiles/tes/info/Transportation%20Planning%20Administrative%20Guidelines%20March%2025%202013.pdf

Development Impact Policy Tools

Alexandria uses a **local area** based Transportation Study to define transportation impacts and mitigation.

Context-Sensitive Variance

Per Section 11-700 of the City code, a Transportation Management Plan is required for developments exceeding certain size thresholds

Local Area Transportation Review

At the time of a Stage I concept submission, the applicant must identify existing and proposed Average Daily Traffic site generation using ITE methods.

Analysis Tools and Thresholds

The development is next categorized into a development size category based on ITE peak hour vehicle trip generation rates (prior to assuming any discounts for mode splits or pass-by trips); a 50-vehicle trip thresholds requires a Transportation Study. Small, medium, and large developments are those that generate at least 50, 100, and 250 trips respectively, and these thresholds are used to define vehicular, non-motorized, and parking study areas in Table 2.2.

Table 2.2 Study Area Guidelines by Development Size Category

Size	Vehicular Study Area*	Transit, Bicycle and Pedestrian Study Area*	Parking Study Area*
Small	As a minimum, include all site driveways and 1000 feet radius or one signalized intersection in each direction, whichever is greater	Adjacent to site	Not applicable
Medium	As a minimum, include all site driveways and one-quarter mile radius or three signalized intersections in each direction, whichever is greater	Area within one-fourth mile of the site	Two block radius or 1,000 feet, whichever is shorter**
Large	As a minimum, include all site driveways and one-half mile radius or four signalized intersections in each direction, whichever is greater	Area within half-mile of the site	Two block radius or 1,000 feet, whichever is shorter**

*All distances are measured from the site perimeter.
**Only if parking modification is requested

The establishment of horizon years is dependent upon development size and phasing; each development typically looks at least six years beyond opening (multiphase developments may look only at the opening year of each separate phase; generally more than six years beyond the first phase). Each mode is analyzed separately.

Automobile

The process is designed to be consistent with the VDOT Chapter 527 review (see Fairfax County, VA for more details on the VDOT process). Conditions are assessed for a three-hour AM and a three-hour PM peak period. ITE trip generation rates are applied, and may be discounted for proximity to a high-volume transit station, using techniques and assumptions from sources such as the WMATA Development-Related Ridership Survey. Highway Capacity Manual techniques (with Synchro accepted; the City may be able to provide a base network) are applied where v/c ratios are < 0.85, with VISSIM in certain cases where the study area includes a dedicated transitway or interstate highway access. Guidance for VISSIM calibration criteria is provided.

Background traffic growth is assessed using background developments (generally within a mile of the site) or MWCOC forecast growth.

Transit

Transit analysis is needed for medium and large projects. Saturday analysis is required for retail sites of more than 75,000 square feet. Analysis of transit LOS can be performed using Florida DOT Transit LOS Indicator methodology, HCM LOS methodology, or similar approaches. T-BEST is recommended for ridership projections.

Bicycle and Pedestrian

The bicycle and pedestrian analysis includes an inventory of existing conditions and deficiencies, using maps and text.

Parking

On-street parking supply and demand is assessed for blockfaces within 1,000' or two blocks, whichever is shorter. Consideration of a shared parking plan is encouraged.

Transportation Management Plan

A TMP may be required under Section 11-700 of the zoning ordinance if the site contains 50,000 GSF office, 40,000 GSF retail, 150,000 GSF industrial, 250 dwelling unit, or an equivalent intensity of mixed uses. A TMP fund is established to finance the transportation strategies to induce people to use modes other than the single occupancy vehicle. Some of these strategies are discounted fare media, shuttle bus service, registration fees for car sharing, bus shelter maintenance, bicycle lockers and parking facilities, and some administrative costs of the plan. The fund stays in an account belonging to the TMP holder but the City can claim this money if no approved transportation activities are conducted. TMP activities include a wide range of TDM facilities and services similar to those promoted in Montgomery County.

Mitigation Approaches

The guidelines do not specify particular evaluation criteria, but the existing, future, and future with proposed mitigation scenarios are used to negotiate developer proffers.

Areawide Review

Alexandria does not have an areawide review.

Transportation Impact Tax

Alexandria does not have a transportation impact tax or fee.

Where to Next?

New York, NY

Jurisdictional Context

The New York City Planning Commission is responsible for the conduct of planning relating to the orderly growth and development of the City, including approval of applications concerning the use, development and improvement of real property subject to City regulation. The City has established an environmental review process, City Environmental Quality Review (CEQR) that dovetails with the State and federal processes. Typically, the Department of City Planning (DCP) typically acts as the Lead Agency in scoping and reviewing the environmental document, with the Department of Transportation (DOT) and Metropolitan Transportation Authority (MTA) as partner agencies.

New York City, NY in a box

Population (2013)	8,405,837
Population growth since 2010	2.8%
Jobs (2014 per BLS)	3,776,719
Geographic Area (sq mi)	302.64
Metropolitan Area	New York-Newark-Jersey City, NY-NJ-PA
Relevant Resources	New York MTC Best Practice Model http://www.nymtc.org/project/bpm/bpmindex.html
Current procedure adoption dates	CEQR Technical Manual (2014) http://www.nyc.gov/html/oec/html/ceqr/technical_manual_2014.shtml (Chapter 16 describes Transportation and includes four pages of relevant resources)

Development Impact Policy Tools

New York City applies a **local area transportation** type of test through its CEQR environmental review process.

Context-Sensitive Variance

New York City has a number of elements where land use context influences the transportation element of the CEQR process:

- The establishment of development thresholds according to the size of the proposed development and which of five zones it is within (Table 16-1);



- Acceptable pedestrian density varies by the level of No-Action pedestrian density
- Acceptable parking loads vary by context zones.

Local Area Transportation Review

The CEQR process identifies a sequential series of assessments (Level 1 scoping, Level 2 assessment, Level 3 analysis) depending on the nature of the development and its projected travel needs.

Analysis Tools and Thresholds

The CEQR requirements for minimum development size are generally designed to establish an analysis threshold in the range of 50 peak hour vehicle trips, 200 peak hour transit trips, and/or 200 peak hour bike/pedestrian trips. Separate subsections of Chapter 16 describe existing, no-action, and with-action assumptions and analyses for each mode. Generally, the peak periods of analysis are one hour in the weekday AM, midday, and PM for each mode, although other peak periods may be required depending on the land use.



In general, the 85 pages of Chapter 16 are a combination of very detailed formulas and specifications, interspersed with guidance describing the importance of judgment in application of the manual contents. The level of analytic requirement and specificity is substantially greater than in any of the other jurisdictions reviewed.

Automobile

The study area definition requires significant judgment and should be based on both project size and expected problem adequacy or safety locations from prior studies; generally between 8 and 30 intersections for traffic analysis are expected for most studies (although citation of a 100-intersection example is cited to note that 30 intersections is not a maximum).

The CEQR technical manual has person-trip generation rates (Table 16-2) for most common land uses based on prior studies. Truck trip generation is identified separately and required for most analyses and passenger-car equivalency (PCE) rates are specified for trucks and buses. ITE Trip Generation data may be used if needed for uncommon development types, but only upon prior approval from DOT and with a modal adjustment factor. New trip generation or modal split surveys may be taken at similar locations, and the CEQR has guidance for how to conduct such surveys. Taxis have a separate trip rate factor (in most cases, one person trip requires two taxi trip-ends, but at intermodal terminals and on most of Manhattan the applicant can assume a factor that reflects the likelihood of a taxi immediately finding a complementary fare).

Traffic assignment may rely on professional judgment or through tools such as the Metropolitan Transportation Commission (MTC) Best Practice model (BPM) or microsimulation models, as long as the models produce MOEs such as average level of service and vehicular delay.

Travel time and delay runs are often required for air quality effect analysis and should be used to assess roadway LOS. Typically, roadway MOEs include v/c ratio, average control delay, and LOS. Person delay may be appropriate (but suggested mostly for transportation projects as opposed to private development projects). Highway Capacity Manual techniques are recommended, with field-verified operational parameters or adjustment factors in most cases. Other software is permitted (Synchro, TRAFFIX, CORSIM, SimTraffic, AIMSUN are cited as examples). Adjacent intersection effects (spillback, metering) should be addressed, although a preferred approach is not described.

Average annual background traffic growth rates between 0% and 1% are to be applied, depending on location and horizon year, and applied with judgment considering both the level of latent demand expected and the degree of local background development traffic to be assumed/assigned.

Significant impacts generally are defined if a subject intersection has a LOS at “mid-D” or worse and the project adds 3 – 5 seconds of delay (3 seconds if LOS F; 5 seconds if mid-D). If freeway segments are considered, density is considered rather than delay (3 pc/mi/ln if LOS F, 5 pc/mi/ln if mid-D).

Transit

Subway and rail analyses may require examination of all station circulation and fare control elements such as fare arrays, vertical circulation, passageways, and platforms as well as line-haul capacity of peak hour services. The CEQR Technical Manual provides several examples of capacity calculations. Coordination with New York City Transit (NYCT) is needed to utilize their analysis techniques and level of service criteria. Background growth rates for auto analysis may also be used for transit.

Example Analysis:

A stair with treads 9'-6" wide with a center handrail has a peak 15-minute volume of 930 passengers, 650 entering and 280 exiting. The stair directly serves the platform.

Effective width = 8'- 3" (deduct six inches from each side and three inches for the intermediate handrail)

Surging factor = 0.75 for passengers exiting the platform

Counterflow factor = 0.90 (70% of flow is in one direction)

$$v/c \text{ ratio} = (650 / (150 \times 8.25 \times 0.90)) + (280 / (150 \times 8.25 \times 0.75 \times 0.90)) = 0.92 \text{ LOS C}$$

Significant impacts are generally defined as causing a circulation element to approach a V/C ratio of 1.0, a line-haul system to be at capacity with the addition of 5 passengers per car, and for bus loads to approach their maximum load at the route’s maximum load point.

Pedestrian

A pedestrian analysis study area should take into consideration likely paths to transit stations and parking lots, with the study area following any likely path from the site if that path is likely to have 200 pedestrians per hour. Highway Capacity Manual procedures are followed to develop pedestrian LOS for

Equation 16-7

$$Y \geq \frac{X}{9.0} - 0.31$$

where,
 Y = decrease in pedestrian space in ft²/p to be considered a potential significant impact
 X = No-Action pedestrian space in ft²/p

sidewalks, street corners, and crosswalks. Average walking speed of 3.5 fps is appropriate unless elderly or school age children make up more than 20% of the population in which case 3.0 fps should be used.

Significant impacts are generally defined based on a relationship between the No-Action pedestrian density and the With-Action pedestrian density, as exemplified by Equation 16-7. Separate criteria apply if platoon flow is reached.

Note that bicycles have no separate analytic requirements in Chapter 16, although they are noted repeatedly throughout the text as important for analysis in considering mode share, TDM programs, and safety.

Parking

An assessment of on-site and off-site parking supply and demand should be undertaken within a reasonable walkshed (generally up a quarter mile), considering both peak arrival/departure periods as well as a peak occupancy period (which may be different from the auto/transit/pedestrian timeframes. Retail uses such as grocery stores may require analysis of several consecutive hours. Parking shortfall occurs when demand is at 98% of capacity.

Mitigation Approaches

The DOT 2009 Street Design Manual should be used to help identify practical and feasible mitigation/improvement measures. In general, mitigation approaches should start with minor improvements and work toward more significant improvements as indicated in Table 16-18. Care should be taken not to create adverse effects on one mode when mitigating impacts to another mode. Generally, the mitigation approaches are similar to those in most jurisdictions in terms of either achieving an acceptable modal LOS or achieving the “No-Action” condition. The CEQR Technical Manual provides similar examples of measures for transit, pedestrian, and parking impacts.

Type of measure	Approval required	Must follow
511. Low-cost, readily implementable measures		
Signal phasing, timing modifications, and midblock stop controls	DOT Signal Division	Manual on Uniform Traffic Control Devices for Multilane stop control street
Parking regulation modifications, one-way, trip control	DOT Borough Engineering	
Lane widening and pavement marking changes	DOT Highway Design and Construction	Street Design Manual
Street closures and other lane-restricted changes	DOT Traffic Planning Division, Highway Design and Construction, Borough Engineering	
512. Moderate-cost, fairly readily implementable measures		
Intersection prioritization improvements	DOT Highway Design and Construction	Street Design Manual
Traffic signal installation, left turn signal	DOT Signal Division	Intersection Cost of Analysis
513. Higher-Cost Mitigation Measures		
Geometric improvements	DOT Highway Design and Construction, EDNY	Street Design Manual
Street widening	DOT Highway Design and Construction	Street Design Manual
Construction of new streets	DOT Highway Design and Construction	Street Design Manual
Construction of new highway ramp	DOT Highway Design and Construction, NYSDOT (for State-owned highways)	Street Design Manual
514. Enforcement Measures		
Traffic enforcement signs	New York City Police Department (NYPD)	
515. Trip Reduction or Travel Demand Management Measures		
Carpooling and vanpooling		
Staggered work hours and flextime programs		
Increased bus service	MTA New York City Transit, DOT Highway Design and Construction (if geometric changes are proposed)	Street Design Manual (if geometric changes are proposed)
New transit service/Telecommuting	MTA New York City Transit	
Bicycle facilities	DOT Office of Bicycle and Pedestrian Programs	

A Traffic Monitoring Plan is recommended for medium to large developments that have unmitigatable impacts. Consideration should also be given to scaling down the development plan to reduce trip generation, or increase the mix of uses to increase internal capture. Several mitigation alternatives may be presented to help the lead and partner agencies evaluate the costs and benefits of each.

Areawide Review

New York City does not have an areawide transportation evaluation process.

Transportation Impact Tax

New York City does not apply an impact tax or fee.

Where to Next?

The CEQR Technical Manual was developed in 1993 and was updated in 2001, 2010, 2012, and 2014. The first 50 pages describe, in track-changes format, the changes made from the 2012 edition from a top-to-bottom review by the City's technical agencies under the supervision of the Mayor's Office of Environmental Coordination.

Pittsburgh, PA

Jurisdictional Context

The Pittsburgh Planning Commission is responsible for development approvals. Zoning cases are handled within the Department of City Planning. Pittsburgh is a second-class municipality as defined by state law (Philadelphia being the state's sole first-class municipality; most boroughs and townships are third-class municipalities) with independent planning and zoning. The Pennsylvania Department of Transportation is responsible for several elements of transportation system operations throughout the commonwealth, notably approval for installation and oversight of traffic signals, even if day to day maintenance is provided by the municipality.

Sample County in a box

Population (2013)	305,841
Population growth since 2010	<0%
Jobs (2014 per BLS)	282,841
Geographic Area (sq mi)	55.37
Metropolitan Area	Pittsburgh, PA
Relevant Resources	Pittsburgh Zoning and Development Review Division http://pittsburghpa.gov/dcp/zoning/
Current procedure adoption dates	PennDOT Policies and Procedures for Transportation Impact Studies Related to Highway Occupancy Permits ftp://ftp.dot.state.pa.us/public/Bureaus/HighwaySafety/Web%20Development/HOP%20Strike%20Off/494-13-13%20Updates%20to%20PennDOT%20Policies%20and%20Procedures%20for%20Impact%20Studies%20Related%20to%20HOPs.pdf Traffic, Parking, and Pedestrian Impact Study Scoping Form (March 2012) http://pittsburghpa.gov/dcp/forms

Development Impact Policy Tools

Pittsburgh has a single-pronged approach to development impact review embodied in the Traffic, Parking, and Pedestrian Impact Study process.

Context-Sensitive Variance

The City of Pittsburgh has three Transportation Management Associations (downtown, Oakland, and the airport corridor).

As part of Act 238 of 2004, the state of Pennsylvania passed the Transit Revitalization Investment District (TRID) Act. This innovative law was designed to encourage transit-oriented development by providing resources for station area planning, and by enabling use of a district-based tax increment financing mechanism to capture increases in property values near transit. It is distinct from tax-increment financing because unlike TIF, it does not require a finding of "blight" in the area where it is used, and focuses on encouraging comprehensive community-based planning. The Urban Redevelopment Authority established the first TRID in Pittsburgh at the East Liberty Station along the East Busway in late 2013. The lack of TRID success (12 planning studies have been completed statewide, but none implemented) is attributed to both the national recession, but also to TRID Act ambiguities and funding mechanism inadequacies; SB 1210 proposes to address these issues and is working through state legislature committees as of September 2014.

Local Area Transportation Review

The City of Pittsburgh has a process for administering a Traffic, Parking, and Pedestrian Impact study that is used for city planning and zoning purposes. The Department of City Planning is responsible for scoping these impact studies and has a high degree of autonomy and flexibility in defining the particular scoping elements of each study at a scoping meeting, within the parameters established by the PennDOT design guides. The scoping form is available on the City's website, but minimum thresholds and requirements are not readily available online; information in this draft literature review is based on the recent traffic impact study for the Lower Hill District (2014).

Analysis Tools and Thresholds

Traffic analysis relies on ITE trip generation rates, Highway Capacity Manual procedures and Synchro analyses. The transportation impact study also addresses site access, circulation and parking elements. Bicycle and pedestrian counts are typically included along with an evaluation of transit system service, although without level of service requirements. Safety considerations across all modes is an important qualitative aspect of identifying potential improvements.

Mitigation Approaches

Mitigation approaches include a variety of typical section, roadway design, and intersection operation considerations.

Areawide Review

The City of Pittsburgh does not have an areawide review process.

Transportation Impact Tax or Fee

Pennsylvania's Act 209 of 1990 provides enabling legislation for municipalities to enact development impact fees in designated transportation service districts. Pittsburgh does not currently use an impact tax or fee mechanism, although the potential for TRID financing is noted on the section regarding context-sensitive approaches.

Where to Next?

Carnegie Mellon University conducted a 2014 study on the Almono development proposal, for which PennDOT studies had suggested \$30M of infrastructure improvement was needed based on current state guidelines. The study effort identified lower vehicle trip generation rates using the EPA MXD trip generation rates and suggested that Pittsburgh consider developing its own trip generation requirements.

Impact fees are identified as one option to be explored for implementing needed infrastructure in the 2013 Strip District Transportation and Land Use Plan.

Fairfax County, VA

Jurisdictional Context

The Fairfax County Board of Supervisors is responsible for approving development projects for the unincorporated areas of the County. The Virginia Department of Transportation owns and operates the public roadway system in Fairfax County and is therefore responsible for determining the sufficiency of Traffic Impact Analyses and proposed mitigation per Chapter 527 of the 2006 Acts of Assembly. Virginia is a “Dillon Rule” state with a strong role of state government in the transportation impact analysis process and a practice of negotiated proffers rather than formulaic exactions.

Fairfax County in a box

Population (2013)	1,130,924
Population growth since 2010	4.5%
Jobs (2014 per BLS)	594,115
Geographic Area (sq mi)	390.97
Metropolitan Area	Washington-Arlington-Alexandria, DC-MD-VA-WV
Relevant Resources	Traffic Impact Analysis Regulations http://www.virginiadot.org/info/traffic_impact_analysis_regulations.asp
Current procedure adoption dates	VDOT Traffic Impact Analysis Regulations (January 2012) http://www.virginiadot.org/projects/resources/chapter527/Traffic_Impact_Analysis_Regulations_24VAC30-155_1.2012.pdf Updated Administrative Guidelines for the Traffic Impact Analysis Regulations (July 2014) http://www.virginiadot.org/projects/resources/chapter527/Administrative_Guidelines_2014.pdf

Development Impact Policy Tools

Fairfax County utilizes the Chapter 527 process, administered through VDOT, as the primary means for mitigating traffic impacts. Proffered roadway improvements and travel demand management (TDM) programs

Context-Sensitive Variance

Several policy nuances and exceptions seek to balance transportation and other community quality of life objectives:

- In January 2013, the Board of Supervisors created the Tysons Service District and established ad valorem tax rates that are estimated to generate about 18% of the \$3.1 billion needed for transportation improvements over the next 40 years.
-

Chapter 527 Traffic Impact Analysis

The Chapter 527 Traffic Impact Analysis identifies roadway deficiencies and mitigation approaches

Analysis Tools and Thresholds

A Chapter 527 TIA is triggered by any development that generates 5,000 daily vehicle trips or would double the amount of traffic on the nearest state highway. Specific contents of the TIA depend upon peak hour vehicle trip thresholds (500, 750, or 1,000), which are generally higher thresholds than typical for local jurisdictions across the US (where 50 to 100 peak hour trip thresholds are most common). The Chapter 527 TIA typically accompanies a rezoning request and requires consideration of multiple horizon years; opening of the each expected development phase, buildout, and six years after buildout.

VDOT considers a range of possible techniques for roadway capacity and safety analyses, including Highway Capacity Manual, SYNCHRO, CORSIM, and VISSIM. Pedestrian, bicycle, and transit analysis are considered if the site has potential to generate significant levels of non-auto trips. TDM analyses and effects are to be considered if a TDM program is proposed.

VDOT has accepted the use of the mixed-use trip generation model developed through cooperation by the Environmental Protection Agency (EPA) and the San Diego Association of Governments' (SANDAG).

Mitigation Approaches

Areawide Review

Fairfax County does not have an areawide review process.

Transportation Impact Tax

Fairfax County does not have a transportation impact tax or fee (other than the Tysons Service District noted above which is funded by ad valorem taxes).

Where to Next?

King County, WA

Jurisdictional Context

King County

King County in a box

Population (2013)	2,044,449
Population growth since 2010	5.9%
Jobs (2014 per BLS)	1,157,234
Geographic Area (sq mi)	2,115.57
Metropolitan Area	Seattle-Tacoma-Bellevue, WA
Relevant Resources	King County Development Standards – Adequacy of Public Facilities and Services http://www.mrsc.org/mc/kingco/24-30_TITLE_21A.pdf#page=237 King County Transportation Concurrency (Section 14.70 of County Code) and Mitigation Payment System (Section 14.75) http://www.mrsc.org/mc/kingco/17_Title_14.pdf#page=35
Current procedure adoption dates	King County Annual Report (2012 posted) http://your.kingcounty.gov/kcdot/roads/wcms/planning/concurrency/2012AnnualReport.pdf

Development Impact Policy Tools

King County uses a three-tiered approach to development impact mitigation

- **Roadway adequacy** assesses safe access and circulation for local site access and intersection performance for vehicular traffic.
- A **Transportation Concurrency Project Review System** is an areawide test that establishes screenline LOS standards for auto and transit
- A **Mitigation Payment System** accounts for contributions to countywide capital improvement needs

Projects of significant size may also be subject to the State Environmental Policy Act requirements for environmental impacts.

Context-Sensitive Variance

King County has defined different land use types and applied context-sensitive performance standards. From a transportation concurrency perspective, roadway level of service standards are based on congested travel speeds with varying LOS standards, ranging from LOS B in the Rural Area to LOS E in the

Urban Growth Area and the Rural Mobility Areas. Minor developments and most public and educational institutions are essential exempted from meeting this criteria through establishment of an LOS F standard.

Affordable housing is exempted from the Mitigation Payment System countywide.

Local Area Transportation Review

King County’s Roadway Adequacy Standards are contained in K.C.C. Section 14.24 pertaining to access and circulation and K.C.C. Section 14-80 pertaining to intersection performance. The elements in Section 14.24 relate to design standards and not to performance measures.

Analysis Tools and Thresholds

An adverse impact occurs at an intersection if the intersection will operate at a LOS worse than “E”, and if the site development will generate more than 30 additional peak hour vehicle trips through that intersection, and that those 30+ vehicle trips constitute more than 20% of the total additional site generated traffic. This definition of a vehicle-volume based effect is similar to the current LATR process of including an assessment of site generated traffic (must increase intersection CLV by 5 or more to be significant) as part of the definition of adverse impact. The combination of 30 vehicle trips in conjunction with more than 20% of total site generated traffic is a significantly higher (i.e., less stringent) definition than that in the LATR guidelines.

Mitigation Approaches

The applicant must identify must either build or provide funding for improvements that will either achieve the LOS E standard or return the intersection to the same level of congestion as would have existed without the site generated traffic.

Areawide Review

Transportation concurrency is described in K.C.C. Section 14.70, and pertains to roadway LOS

Analysis Tools and Thresholds

Roadway performance is established based on roadway travel time level of service, with different congested speed ranges associated with different roadway functional classifications, similar to the Montgomery County relative arterial mobility as it had been defined under Policy Area Mobiliy Review. King County is divided into 25 separate travelsheds and the average LOS is defined for each travelshed on an annual basis. King County prepares a map identifying the travelsheds with failing

2. The following table identifies the range of travel speeds for the travel time levels of service

Road Classification:	ROAD LEVELS OF SERVICE			
	I (State Routes)	II (Principal Arterials)	III (Minor Arterials)	IV (Collector Arterials)
LEVEL OF SERVICE	AVERAGE TRAVEL SPEED (MILES PER HOUR)			
A	>42	>35	>30	>25
B	>34 – 42	>28 – 35	>24 – 30	>19 – 25
C	>27 – 34	>22 – 28	>18 – 24	>13 – 19
D	>21 – 27	>17 – 22	>14 – 18	>9 – 13
E	>16 – 21	>13 – 17	>10 – 14	>7 – 9
F	<=16	<=13	<=10	<=7

(Ord. 18266 § 6, 2008; Ord. 15839 § 2, 2007; 15030 § 2, 2004; Ord. 14580 § 2, 2003; Ord. 14375 § 1, 2002; Ord. 14050 § 9, 2001).

Mitigation Approaches

The Department of Permitting and Environmental Review may not accept applications for areas that do not pass the transportation concurrency test. In essence, this process is similar to the moratorium process Montgomery County had as part of Policy Area Review.

Mitigation Payment System

King County uses a Mitigation Payment System to charge a transportation impact fee for residential development based on the proportional share of traffic impact in each of the County's travel demand model Transportation Analysis Zones (TAZ). Discounts are made to reflect the degree to which trips have one trip-end in a jurisdiction that has its own impact fee system to avoid double-counting. The travel model assignment is used to identify the increased travel demand generated by each TAZ and its proportional contribution to the needed facility improvements in the Mitigation Payment System project list.

2014 Fee Schedule for the Road Impact Mitigation Payment System

For each zone in King County, this schedule lists the fee per new single family dwelling unit (SF Fee) and fee per dwelling unit in a multiple family residential (MF Fee). Also shown are fees for subject lots (SF Fee) of 2,000 sq ft and an MF Fee of 2,000 sq ft. In addition to the per-unit fee, developers in a program administration fee of \$400 is charged per dwelling unit.

Zone	SF Fee	MF Fee	Zone	SF Fee	MF Fee	Zone	SF Fee	MF Fee
70	242.00	525.50	176	244.00	525.50	246	244.00	525.50
71	242.00	525.50	177	244.00	525.50	247	244.00	525.50
72	242.00	525.50	178	244.00	525.50	248	244.00	525.50
73	242.00	525.50	179	244.00	525.50	249	244.00	525.50
74	242.00	525.50	180	244.00	525.50	250	244.00	525.50
75	242.00	525.50	181	244.00	525.50	251	244.00	525.50
76	242.00	525.50	182	244.00	525.50	252	244.00	525.50
77	242.00	525.50	183	244.00	525.50	253	244.00	525.50
78	242.00	525.50	184	244.00	525.50	254	244.00	525.50
79	242.00	525.50	185	244.00	525.50	255	244.00	525.50
80	242.00	525.50	186	244.00	525.50	256	244.00	525.50
81	242.00	525.50	187	244.00	525.50	257	244.00	525.50
82	242.00	525.50	188	244.00	525.50	258	244.00	525.50
83	242.00	525.50	189	244.00	525.50	259	244.00	525.50
84	242.00	525.50	190	244.00	525.50	260	244.00	525.50
85	242.00	525.50	191	244.00	525.50	261	244.00	525.50
86	242.00	525.50	192	244.00	525.50	262	244.00	525.50
87	242.00	525.50	193	244.00	525.50	263	244.00	525.50
88	242.00	525.50	194	244.00	525.50	264	244.00	525.50
89	242.00	525.50	195	244.00	525.50	265	244.00	525.50
90	242.00	525.50	196	244.00	525.50	266	244.00	525.50
91	242.00	525.50	197	244.00	525.50	267	244.00	525.50
92	242.00	525.50	198	244.00	525.50	268	244.00	525.50
93	242.00	525.50	199	244.00	525.50	269	244.00	525.50
94	242.00	525.50	200	244.00	525.50	270	244.00	525.50
95	242.00	525.50	201	244.00	525.50	271	244.00	525.50
96	242.00	525.50	202	244.00	525.50	272	244.00	525.50
97	242.00	525.50	203	244.00	525.50	273	244.00	525.50
98	242.00	525.50	204	244.00	525.50	274	244.00	525.50
99	242.00	525.50	205	244.00	525.50	275	244.00	525.50
100	242.00	525.50	206	244.00	525.50	276	244.00	525.50
101	242.00	525.50	207	244.00	525.50	277	244.00	525.50
102	242.00	525.50	208	244.00	525.50	278	244.00	525.50
103	242.00	525.50	209	244.00	525.50	279	244.00	525.50
104	242.00	525.50	210	244.00	525.50	280	244.00	525.50
105	242.00	525.50	211	244.00	525.50	281	244.00	525.50
106	242.00	525.50	212	244.00	525.50	282	244.00	525.50
107	242.00	525.50	213	244.00	525.50	283	244.00	525.50
108	242.00	525.50	214	244.00	525.50	284	244.00	525.50
109	242.00	525.50	215	244.00	525.50	285	244.00	525.50
110	242.00	525.50	216	244.00	525.50	286	244.00	525.50
111	242.00	525.50	217	244.00	525.50	287	244.00	525.50
112	242.00	525.50	218	244.00	525.50	288	244.00	525.50
113	242.00	525.50	219	244.00	525.50	289	244.00	525.50
114	242.00	525.50	220	244.00	525.50	290	244.00	525.50
115	242.00	525.50	221	244.00	525.50	291	244.00	525.50
116	242.00	525.50	222	244.00	525.50	292	244.00	525.50
117	242.00	525.50	223	244.00	525.50	293	244.00	525.50
118	242.00	525.50	224	244.00	525.50	294	244.00	525.50
119	242.00	525.50	225	244.00	525.50	295	244.00	525.50
120	242.00	525.50	226	244.00	525.50	296	244.00	525.50
121	242.00	525.50	227	244.00	525.50	297	244.00	525.50
122	242.00	525.50	228	244.00	525.50	298	244.00	525.50
123	242.00	525.50	229	244.00	525.50	299	244.00	525.50
124	242.00	525.50	230	244.00	525.50	300	244.00	525.50
125	242.00	525.50	231	244.00	525.50	301	244.00	525.50
126	242.00	525.50	232	244.00	525.50	302	244.00	525.50
127	242.00	525.50	233	244.00	525.50	303	244.00	525.50
128	242.00	525.50	234	244.00	525.50	304	244.00	525.50
129	242.00	525.50	235	244.00	525.50	305	244.00	525.50
130	242.00	525.50	236	244.00	525.50	306	244.00	525.50
131	242.00	525.50	237	244.00	525.50	307	244.00	525.50
132	242.00	525.50	238	244.00	525.50	308	244.00	525.50
133	242.00	525.50	239	244.00	525.50	309	244.00	525.50
134	242.00	525.50	240	244.00	525.50	310	244.00	525.50
135	242.00	525.50	241	244.00	525.50	311	244.00	525.50
136	242.00	525.50	242	244.00	525.50	312	244.00	525.50
137	242.00	525.50	243	244.00	525.50	313	244.00	525.50
138	242.00	525.50	244	244.00	525.50	314	244.00	525.50
139	242.00	525.50	245	244.00	525.50	315	244.00	525.50
140	242.00	525.50	246	244.00	525.50	316	244.00	525.50
141	242.00	525.50	247	244.00	525.50	317	244.00	525.50
142	242.00	525.50	248	244.00	525.50	318	244.00	525.50
143	242.00	525.50	249	244.00	525.50	319	244.00	525.50
144	242.00	525.50	250	244.00	525.50	320	244.00	525.50
145	242.00	525.50	251	244.00	525.50	321	244.00	525.50
146	242.00	525.50	252	244.00	525.50	322	244.00	525.50
147	242.00	525.50	253	244.00	525.50	323	244.00	525.50
148	242.00	525.50	254	244.00	525.50	324	244.00	525.50
149	242.00	525.50	255	244.00	525.50	325	244.00	525.50
150	242.00	525.50	256	244.00	525.50	326	244.00	525.50
151	242.00	525.50	257	244.00	525.50	327	244.00	525.50
152	242.00	525.50	258	244.00	525.50	328	244.00	525.50
153	242.00	525.50	259	244.00	525.50	329	244.00	525.50
154	242.00	525.50	260	244.00	525.50	330	244.00	525.50
155	242.00	525.50	261	244.00	525.50	331	244.00	525.50
156	242.00	525.50	262	244.00	525.50	332	244.00	525.50
157	242.00	525.50	263	244.00	525.50	333	244.00	525.50
158	242.00	525.50	264	244.00	525.50	334	244.00	525.50
159	242.00	525.50	265	244.00	525.50	335	244.00	525.50
160	242.00	525.50	266	244.00	525.50	336	244.00	525.50
161	242.00	525.50	267	244.00	525.50	337	244.00	525.50
162	242.00	525.50	268	244.00	525.50	338	244.00	525.50
163	242.00	525.50	269	244.00	525.50	339	244.00	525.50
164	242.00	525.50	270	244.00	525.50	340	244.00	525.50
165	242.00	525.50	271	244.00	525.50	341	244.00	525.50
166	242.00	525.50	272	244.00	525.50	342	244.00	525.50
167	242.00	525.50	273	244.00	525.50	343	244.00	525.50
168	242.00	525.50	274	244.00	525.50	344	244.00	525.50
169	242.00	525.50	275	244.00	525.50	345	244.00	525.50
170	242.00	525.50	276	244.00	525.50	346	244.00	525.50
171	242.00	525.50	277	244.00	525.50	347	244.00	525.50
172	242.00	525.50	278	244.00	525.50	348	244.00	525.50
173	242.00	525.50	279	244.00	525.50	349	244.00	525.50
174	242.00	525.50	280	244.00	525.50	350	244.00	525.50
175	242.00	525.50	281	244.00	525.50	351	244.00	525.50
176	242.00	525.50	282	244.00	525.50	352	244.00	525.50
177	242.00	525.50	283	244.00	525.50	353	244.00	525.50
178	242.00	525.50	284	244.00	525.50	354	244.00	525.50
179	242.00	525.50	285	244.00	525.50	355	244.00	525.50
180	242.00	525.50	286	244.00	525.50	356	244.00	525.50
181	242.00	525.50	287	244.00	525.50	357	244.00	525.50
182	242.00	525.50	288	244.00	525.50	358	244.00	525.50
183	242.00	525.50	289	244.00	525.50	359	244.00	525.50
184	242.00	525.50	290	244.00	525.50	360	244.00	525.50
185	242.00	525.50	291	244.00	525.50	361	244.00	525.50
186	242.00	525.50	292	244.00	525.50	362	244.00	525.50
187	242.00	525.50	293	244.00	525.50	363	244.00	525.50
188	242.00	525.50	294	244.00	525.50	364	244.00	525.50
189	242.00	525.50	295	244.00	525.50	365	244.00	525.50
190	242.00	525.50	296	244.00	525.50	366	244.00	525.50
191	242.00	525.50	297	244.00	525.50	367	244.00	525.50
192	242.00	525.50	298	244.00	525.50	368	244.00	525.50
193	242.00	525.50	299	244.00	525.50	369	244.00	525.50
194	242.00	525.50	300	244.00	525.50	370	244.00	525.50
195	242.00	525.50	301	244.00	525.50	371	244.00	525.50
196	242.00</							

Seattle, WA

Jurisdictional Context

The Seattle Design Review Board approves development applications in the City of Seattle. The Department of Planning and Development (DPD) manages the statewide transportation concurrency review and local transportation impact analysis review processes.

Seattle in a box

Population (2013)	652,405
Population growth since 2010	7.2%
Jobs (2014 per BLS)	508,350
Geographic Area (sq mi)	83.94
Metropolitan Area	Seattle-Tacoma-Bellevue, WA
Relevant Resources	Transportation Concurrency and Transportation Impact Mitigation http://clerk.seattle.gov/~scripts/nph-brs.exe?d=CODE&s1=23.52.008.snum.&Sect5=CODE1&Sect6=HITOFF&l=20&p=1&u=~public/code1.htm&r=1&f=G
Current procedure adoption dates	Transportation Concurrency Project Review System (2009) http://www.seattle.gov/dpd/codes/dr/DR2009-5.pdf

Development Impact Policy Tools

Seattle's transportation impact analyses are governed by Section 23.52.008 of the City Code and include:

- A **Transportation Impact Analysis** is a local area test.
- A **Transportation Concurrency Project Review System** is an areawide test that establishes screenline LOS standards for auto and transit

Projects of significant size may also be subject to the State Environmental Policy Act requirements for environmental impacts.

Context-Sensitive Variance

Seattle's comprehensive plan and supporting implementation policies promote the concept of **urban centers and urban villages**. The thresholds for conducting a Transportation Impact Analysis vary by approved zone, per Section 23.52.008 of the City Code, with more stringent



requirements in low-density neighborhoods compared to downtown zones.

Local Area Transportation Review

Analysis Tools and Thresholds

Based on the City Code, an impact analysis is required for any development that contains more than 50 dwelling units or 12,000 square feet of non-residential floor area. The analysis must identify:

- daily and peak hour vehicle trips,
- likely distribution of project traffic and effects on operations,
- availability and expected use of transit,
- existing and projected bicycle/pedestrian conditions, including access to transit
- accident history

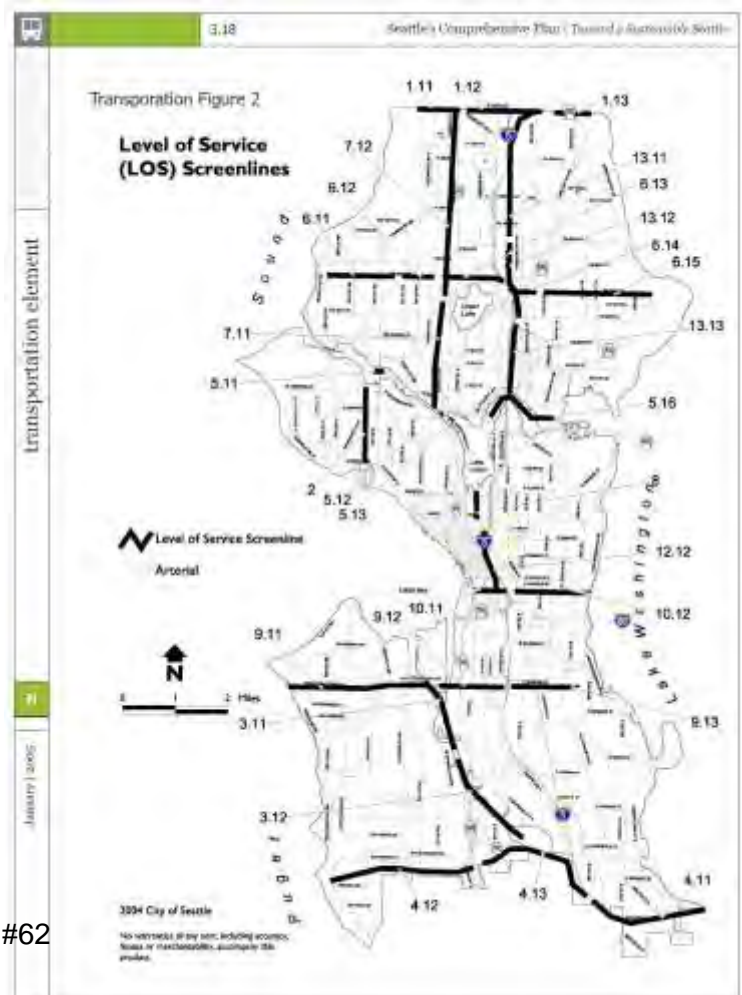
SEPA review may result in transportation mitigation measures consistent with SEPA policies such as full or partial contributions to transportation system improvements, such as new or upgraded traffic signals or roadway modifications. As part of the environmental review process, transportation impact analyses (TIA) or parking demand studies may be required to document a project's transportation or parking impacts. A TIA typically estimates traffic volumes that a proposed project would generate, and compares the operating conditions of nearby intersections or roadway segments with and without the additional traffic. A TIA may also estimate potential traffic queues, examine any outstanding safety issues, and assess the impact of the project on transit, pedestrian, and bicycle facilities.

Mitigation Approaches

Roadway capacity enhancements are generally restricted to projects that do not meet SEPA LOS requirements (see Areawide Review section). Residential project mitigation in downtown zones is generally limited to bicycle parking and traveler information. For commercial or mixed-use projects in downtown zones and all projects citywide, a wide range of access/circulation and TDM approaches may be applicable for mitigation.

Areawide Review

Projects may also be required to demonstrate that they satisfy transportation concurrency requirements established under the Washington State Growth Management Act. The City of Seattle uses a screenline approach to track transportation concurrency. Under this approach, a transportation analysis estimates the auto trips generated by the



project that will cross one or more screenlines near the project site. Project volumes plus background traffic volumes for a screenline are compared to the established capacity for the screenline. Transportation Figure 2 in Seattle's 2005 Comprehensive Plan identifies 28 screenlines with existing and 2020 projected volume-to-capacity ratios on arterial roadways as well as LOS standards (that are either a 1.00 or 1.20 v/c ratio for each screenline). Mitigation for failing screenline LOS can include vehicle trip reduction programs, capacity improvements, or payment-in-lieu for capacity enhancing projects that can be expected to be built within 6 years.

Transportation Impact Tax

Seattle does not have a development impact fee but is considering enacting one (City Council's Transportation Committee worksession September 10, 2014):

<http://www.seattle.gov/council/committees/transportation/default.htm>

Where to Next?

Ongoing discussion associated with the Seattle 2035 Comprehensive Plan update and consideration of impact fees.