



City of Tualatin
10699 SW Herman Rd
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Tualatin Traffic Study Requirements

Tualatin Development Code Section 74.440 states:

The City Manager may require a traffic study to be provided by the applicant and furnished to the City as part of the development approval process as provided by this Code, when the City Manager determines that such a study is necessary in connection with a proposed development project in order to:

- a) Assure that the existing or proposed transportation facilities in the vicinity of the proposed development are capable of accommodating the amount of traffic that is expected to be generated by the proposed development and/or*
- b) Assure that the internal traffic circulation of the proposed development will not result in conflicts between on-site parking movements and/or on-site loading movements and/or on-site traffic movements, or impact traffic on the adjacent streets.*

The required traffic study must be completed prior to the approval of the development application.

This document describes the protocol typically used by city staff to decide whether or not to require a traffic study, what needs to be included in each study, and how each study needs to be conducted.

City staff may require additional traffic study and/or waive certain requirements if, in their professional judgement, it is in the public interest to do so.

Cooperation between the applicant, the applicant's engineer, and City staff is strongly encouraged throughout this process. Please do not hesitate to contact City staff with any questions.

All proposals must include:

- A Site Plan showing the proposed development and how it relates to the public street system
- A Description of the proposal and anticipated uses of the development
- A description of the amount of traffic that would be going to or from the proposed development.
- Description of onsite traffic circulation and connectivity (including any potential effects on public streets)
- Sight distance at project access points (such as verifying drivers can adequately see oncoming traffic, pedestrians, etc. when pulling into or out of the site).
- Evaluation of site access compared to spacing standards for access to or near Arterials or Collectors

What Type of Study Is Required?

There are two levels of additional analysis that may be required:

- 1) A **Trip Generation and Distribution Description** describes the amount of traffic (including all modes of travel) that would be anticipated going to and from the proposed development, and the common routes this traffic would use.



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- 2) A **Transportation Impact Analysis** is a more detailed study of the existing and future transportation network (for all modes of travel) and how the proposed development would affect the transportation network. The first phase of completing a Transportation Impact Analysis is completing a Trip Generation and Distribution Description

When is a Trip Generation and Distribution Description Required?

A **Trip Generation and Distribution Description** is required for:

- a) Any zone change that may result in more trip generation than previously allowed
- b) Any development that, in the judgement of City staff, would generate 100 or more new daily trips. Developments anticipated to generate this level of traffic, and thus require a Trip Generation and Distribution Description, include:
 - a. 10 or more single-family homes,
 - b. 15 or more multi-family units,
 - c. Industrial buildings 15,000sf or larger,
 - d. Office buildings 8,000sf or larger,
 - e. Any use with customers or public coming to the site (such as retail, restaurant, school, medical office, recreation, etc.)
- c) Any case where, in the judgement of city staff, a Trip Generation and Distribution Description is necessary to protect the public interest.

What Are the Requirements for a Trip Generation and Distribution Description?

The Trip Generation and Distribution Description includes an estimate of the number of trip ends for each mode of travel (passenger vehicle, truck, walking, cycling, transit, etc.). Trip generation estimates for all modes should be based on the character of the proposed development and the surrounding neighborhood, available regional data, and accepted national resources. Passenger vehicle trip generation data from the current edition of the Institute of Transportation Engineers' (ITE) *Trip Generation* should be used unless more appropriate data is available.

If more than two truck trips per day are anticipated, include a detailed estimate of the number, vehicle size, and time of day of truck trips. The applicant will need to explain why the particular data and estimates used most accurately forecast the trip generation of the proposed development.

For proposed developments in industrial/manufacturing areas include a base trip generation in accordance with ITE 110 (General Light Industrial) development. Staff may require and/or the developer may present a second scenario based on a different classification if it would more accurately reflect the proposed development. The trip generation listed should reflect a reasonable 'maximum traffic effect' scenario under allowed zoning.

Trip distribution estimates should be based on historical data, existing and future traffic characteristics, vehicle tracking, available modeling data, and origin-destination data as available. Estimates must be provided for all modes of travel.



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If used, estimates of pass-by, internal, diverted-linked, and other types of trips should be based on commonly accepted standards (such as ITE), characteristics of the proposed development, its location on the transportation system, and other factors. The applicant will need to explain how the calculations and estimates used most accurately forecast the trip characteristics of the proposed development.

The trip generation and distribution description need to include a review of existing Pedestrian and bicycle facilities that would be used by people to and from the proposed development, adjacent to the development, and potential connections to adjacent properties. Each likely route should be reviewed for the adequacy of the facility to meet needs reasonably anticipated with the proposed development. This includes identifying a safe walking route (and any needed improvements to that route) to school for residential developments within a half mile of a school or within the school district designated walk zone boundary.

City staff will review submitted trip generation and distribution descriptions. Revisions may be required to accurately (in staff judgement) reflect the anticipated trip generation and distribution of the proposed development.

When Is a Transportation Impact Analysis Required?

A full **Transportation Impact Analysis** is required for cases (in staff's judgement) that:

- a) Would be anticipated to generate more than 500 vehicle trip ends per day and/or more than 60 vehicle trip ends in the morning or evening peak hour and/or more than 100 vehicle trip ends during the peak hour of development traffic. Developments anticipated to generate this amount of traffic (and thus require a Transportation Impact Analysis) include:
 - a. 50 or more single-family residences,
 - b. 80 or more multi-family residences,
 - c. 75,000 square feet or more of industrial space,
 - d. 40,000 square feet or more of office space,
 - e. 10,000 square feet or more of retail space,
 - f. any restaurant, convenience market, or gas station,
 - g. any development with a drive-through.
- b) Would be anticipated to generate more than 20 large truck trips per day
- c) Propose a zone change that, in typical build-out scenarios, would be anticipated to generate more traffic than the previous zoning
- d) Are adjacent to a roadway where there is question about its cross section, such as the need for turn lanes at intersections or a site driveway, need for adequate queuing space between intersections and/or driveways, need for pedestrian or bicycle facilities, or other issues.
- e) Would result in significant non-residential traffic through a residential neighborhood.



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- f) Would be required to submit a traffic study by the County or State guidelines for impact on their roads.
- g) There is any doubt that the existing or proposed transportation facilities in the vicinity of the proposed development are capable of accommodating the amount of traffic expected to be generated by the proposed development or that on-site facilities would adequately function without impacting public streets.
- h) A traffic study is necessary to protect the public interest.

What Area Must Be Studied in the Transportation Impact Analysis?

Prior to determining the study area, the applicant must obtain City staff approval of the Trip Generation and Distribution Description (see above) for the proposed development.

The Transportation Impact Analysis must include a comprehensive study of at least the following areas:

- a) All proposed site access points to the public street system.
- b) All roads and intersections along the frontage of the subject property.
- c) Any road or intersection where the proposed development would be anticipated to generate more than 500 additional vehicle trips per day or more than 60 vehicle trips in a single hour. If a two-way-stop-controlled intersection functions acceptably and the proposed development would add less than 50 trips per day on the minor leg, it need not be included by this criterion.
- d) The route(s) trucks would use from the site to the arterial system must be identified for all developments and analyzed for truck travel if used for more than 10 truck trips per day.
- e) Walking and cycling routes to transit stops within ¼ mile, parks and retail areas within ½ mile and, for residential developments, schools within 1 mile.
- f) Any other areas where, in staff judgement, traffic study is needed to protect the public interest.

What Timeframe Must Be Considered in Transportation Impact Analyses?

The Transportation Impact Analysis must analyze the existing conditions of the transportation network, and the transportation system one year after site buildout, with the proposed development and any other in-process developments in the area. Analysis of an interim scenario may be necessary for phased developments depending on the phasing of transportation improvements.

A future scenario of area build-out 20 years after development must be analyzed for any zone change that may result in more trip generation than previously allowed, or to establish the need for turn lanes and other capacity improvements along the development frontage. Verify with City staff to see what future analysis is necessary for each case.

City staff may require analysis of additional timeframes as appropriate in their judgement to protect the public interest.



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What Must Be Included in a Transportation Impact Analysis?

Prior to performing the Transportation Impact Analysis, the applicant must obtain City staff approval of the study area (see above).

In order to be reviewed, the Transportation Impact Analysis report must include the following (incomplete reports will be returned for completion):

- 1) All Transportation Impact Analyses must be signed and stamped by a Professional Traffic Engineer or Civil Engineer (with experience in traffic) actively registered in the State of Oregon by the Oregon State Board of Examiners for Engineering and Land Surveying (OSBEELS).
- 2) An executive summary discussing the development, the major findings of the analysis, and the mitigation measures proposed. This must include a statement by the engineer that the resulting transportation network with the development and mitigation measures as proposed will provide adequate facilities for the public that meet all appropriate safety standards and practices.
- 3) A vicinity map showing the proposal in relation to the area transportation system
- 4) A complete description of the proposed development including a site plan, the nature and size of each proposed use (or reasonable worst-case scenario if use unknown), the proposed location, design, and traffic control of all site accesses, and the distance from each access to adjacent streets and/or accesses.
- 5) A description of the current and proposed (as known) land uses near the site including trip information for any properties that would share or gain access across the subject property.
- 6) A description of the transportation facilities in the study area including street names, functional classifications, jurisdiction, sidewalks, bike lanes, facilities for people with disabilities, transit routes, traffic control, lane configurations, etc., and any planned improvements in the area.
- 7) Existing traffic volumes measured within the last 12 months during design conditions. Include hourly counts for intersections and daily counts for road segments.
- 8) Crash data and crash history analysis (including breakdown by severity and type, observed intersection crash rate per million entering vehicles) for the most recent available five-year period (from the Oregon Department of Transportation).
- 9) Identification of the analysis periods – the time(s) with the most traffic issues and the time(s) when the proposed development would have the most impact or needs. This is typically the morning and afternoon weekday peak hours and/or peaks of development traffic, but can include mid-day or weekend peak hours depending on the specific proposal.
- 10) Existing performance of the vehicular transportation system including Levels of Service (LOS) and Volume/Capacity (V/C) ratios for all intersections and street segments in the study area. The LOS and V/C data shall be calculated using the current Highway Capacity Manual methodologies as approved by ODOT and calibrated to reflect observed site conditions through delay studies and other observations (not solely calculated from theoretical assumptions).



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- 11) Description of how calculation methods have been calibrated based on observed traffic data and the calibration that will be used for the forecast scenarios.
- 12) Evaluation of Existing conditions for walking, cycling, and people with disabilities for all streets and paths in the study area. This evaluation should focus on providing connectivity to existing walking and biking routes and identify any gaps near or along key routes to the development.
- 13) The trip generation and distribution description (see above) for this development.
- 14) Trip generation figures for pending or approved developments in or affecting the study area (City staff can help provide data).
- 15) Forecast background traffic volumes in the year the development is planned to open.
- 16) Forecast performance (including LOS, V/C, etc.) with and without the proposed development in the year after it opens.
- 17) Evaluation of post-development conditions for walking, cycling, and people with disabilities for all street and path segments in the study area. This will include identifying impact and contribution by development for gaps in the bicycle and pedestrian network identified in step 12. This includes forecast pedestrian and cyclist volumes and multi-modal level of service for each link. Include evaluation of crossing needs along key walking routes, where applicable. Include a listing of all locations where improvements are necessary to provide adequate facilities for pedestrians, cyclists, and people with disabilities traveling to and from the proposed development.
- 18) Forecast traffic volumes and transportation system performance in the horizon year and the planned opening years of any future phases of development.
- 19) Forecast pedestrian, cyclist and persons with disabilities conditions and needs in the future phase and horizon years.
- 20) Sight distance analysis of the proposed site access(es) based on AASHTO stopping sight distance.
- 21) Evaluation of proposed access locations compared to local access spacing standards and access locations specified in adopted codes or plans.
- 22) Evaluation of traffic signal warrants and turn lane warrants for site intersections and frontage roadways, where applicable.
- 23) Traffic flow, safety, and pedestrian/cyclist needs analysis of the proposed site access(es), including turn lane needs, queue lengths, channelization, turn restrictions, crossing needs, walking and rolling routes, turning movements for design vehicles, comparison with standards, and other operational and safety issues.
- 24) Evaluation of anticipated queuing at the study area intersections and site accesses and description of any potential locations where queues may overlap, block travel lanes or bike lanes, extend through crosswalks, intersections or across accesses, or otherwise cause issues.
- 25) When downstream deficiencies may impact upstream operations (i.e. queue spillback between intersections, turn lane queue block through lanes, etc.) during the peak 15 minutes of peak



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hour operations, evaluation of upstream operational performance shall include traffic simulation analysis utilizing SimTraffic, Vissim, or alternate software and methodology approved by City staff. Simulation analysis shall be developed and calibrated per the ODOT Analysis Procedures Manual and shall be undertaken to determine average and 95th percentile queue length.

- 26) Evaluation of on-site parking, traffic flow, pedestrian, cyclist, and persons with disabilities accommodations and the adequacy thereof, and anticipated impact of the proposed development on nearby streets. Identify plans and mitigation measures necessary to prevent offsite impacts, such as keeping site traffic queues from extending onto public streets.
- 27) Analysis as appropriate of any potential adverse or controversial effects of the proposed development, such as non-residential traffic through residential neighborhoods, effects on school zones, significant traffic increases on 'quiet' streets, or site traffic queues affecting public streets.
- 28) Listing of all intersections, segments, and locations that are projected to not meet City standards for traffic, safety, pedestrian, cyclist, or transit needs in the study area during the study timeframe.
- 29) Recommendation of necessary improvements to ensure an acceptable level of service for roadways of at least D and E for signalized and unsignalized intersections respectively, after future traffic impacts are considered (per Tualatin Development Code Chapter 74). Include analysis verifying that these measures will bring the facilities up to appropriate standards, and include proposed geometry, operations, and warrant analyses for proposed signals, turn lanes, crosswalks, etc. and other analysis as appropriate. Any proposed mitigation must be feasible. Include proposed development requirements to accomplish the appropriate mitigation.
- 30) Copies of raw traffic count data used in the analysis (may be in an appendix).
- 31) Copies of the complete raw traffic analysis output showing the specific traffic data input, timing etc. used in the analysis, and specific results generated (may be in an appendix).
- 32) Copies of base electronic files (i.e. software files of queuing or capacity analysis) if requested to aid in staff review and allow for sensitivity analysis.
- 33) Any other information that the applicant's team believes would provide a clearer picture of the proposed development and its anticipated impacts.
- 34) Any other analysis identified by staff as necessary and in the public interest to understand the proposed development and its anticipated and potential transportation impacts.

City staff may, at their discretion, add requirements as they judge appropriate to protect the public interest, or may waive one or more of the above requirements if the requirement is not applicable to the proposed development or would not provide enough information in the public interest to justify doing the analysis.



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What Methodologies and Parameters Must Be Followed in Doing the Analysis?

- A) All Transportation Impact Analyses must include a statement by the engineer that the resulting transportation network with the development and mitigation measures as proposed will provide adequate facilities for the public that meet all appropriate safety standards and practices.
- B) For any County Roads or State Highways (including interchange areas) within or adjacent to the study area, the analysis must meet the requirements of the appropriate County and/or the Oregon Department of Transportation. Contact the appropriate agency for their requirements.
- C) Traffic counts, delay studies, and other on-site analysis must be done during normal or reasonable worst-case traffic conditions within 12 months of the analysis date. This is typically on a Tuesday, Wednesday, or Thursday (except for weekend scenarios) in decent weather with school in session and no unusual events/holidays that would affect traffic.
- D) The Level of Service (LOS), Volume/Capacity Ratio (V/C), and other analysis parameters for existing conditions must be calibrated to on-site conditions through delay studies and other measurements. Calculation methods must match actual on-site conditions based on the procedures in the current Highway Capacity Manual approved by ODOT and other accepted standards, and a description of this calibration process and resulting adjustments must be included in the analysis report.
- E) Per Tualatin Development Code Chapter 74 Intersections should be improved to operate at a level of service of at least D and E for signalized and unsignalized intersections, respectively.
- F) Acceptable analysis methods and software include the current ODOT approved *Highway Capacity Manual methodology*, *ITE Trip Generation Manual*, *Synchro*, *SimTraffic*, *Vissim*, *Vistro*, *SIDRA Intersection*, *MUTCD*, *AASHTO*, and other commonly accepted traffic analysis programs. Check with City staff beforehand to verify the acceptability of a particular method if in question.
- G) Signal timing used in capacity or progression analysis shall be within the signal timing parameters currently used at that location. Adequate time must be provided for pedestrian crossing at crosswalks at MUTCD crossing rates. Any assumptions about progression must match existing conditions and/or be approved by the agency timing the subject traffic signals. New crosswalk closures are typically not permitted. Signal timing alone is not an acceptable mitigation measure.
- H) All calculations, analysis results, and conclusions must be reasonable, understandable, consistent, and fully explained. Conclusions must be consistent with the analysis presented. Calculations, graphs, tables, data, results, and/or conclusions that are contrary to engineering practice and/or common sense will not be accepted and may lead to the traffic study being returned to the applicant for correction.
- I) If the development proposal changes in ways that, in City staff's judgement, would materially affect the traffic study, the traffic study must be revised or re-done to account for such changes.
- J) The attached checklist will be used by City staff to determine if a Transportation Impact Analysis contains sufficient information to be reviewed. Acceptance for review does not signify



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adequacy, and changes may be required in the review process. Incomplete and/or unacceptable analyses will be returned for completion/correction.

- K) Cooperation between the applicant, the applicant's engineer, and City staff is strongly encouraged throughout this process. Please do not hesitate to contact City staff with any questions.

Updated March 16, 2022