RESOLUTION NO. 20-37

A RESOLUTION ADOPTING UPDATED GUIDELINES FOR TRANSPORTATION IMPACT ANALYSES

WHEREAS, the impact of traffic generated from new development is a serious concern of the City of Oregon City; and

WHEREAS, the City recognizes the balance between property owner's rights to develop their property and the need for a safe, reliable, and adequate transportation system; and

WHEREAS, previously a Site Traffic Impact Study Procedures document, Policy No. 23 dated December 15, 1990 was published; and

WHEREAS, the Site Traffic Impact Study Procedures document, Policy No. 23 dated December 15, 1990 was replaced by the Guidelines for Transportation Analyses by Resolution 05-30 on November 2, 2005; and

WHEREAS, the City desires to update the document once again to bring the document into compliance with current City Code and practices for Traffic Impact Letters and Traffic Impact Studies.

NOW, THEREFORE, OREGON CITY RESOLVES AS FOLLOWS:

Section 1. That the Commission, by this Resolution, adopts the Guidelines for Transportation Analyses, attached to this Resolution as Exhibit "A".

Section 2. The effective date for the Guidelines for Transportation Analyses shall be 30 days from the date this Resolution is adopted, signed, and approved.

Section 3. The Guidelines for Transportation Analyses adopted by this Resolution shall supersede the Guidelines for Transportation Analyses, as adopted November 2, 2005.

Approved and adopted at a regular meeting of the City Commission held on the 16th day of June 2021.

RACHEL LYLES SMITH,
Mayor

Attested to this 16th day of June 2021:

Kattie Riggs, City Recorder

Approved as to legal sufficiency:

City Attorney

Attachment:
Exhibit A. Guidelines for Transportation Analyses

CITY OF OREGON CITY

GUIDELINES FOR

TRANSPORTATION IMPACT ANALYSES

Adopted : NOVEMBER 2, 2005
Revised : JULY 16, 2021

1.0 PURPOSE

1.1 TRANSPORTATION PLANNING AND TRANSPORTATION IMPACT ANALYSES (TIAs)

Oregon City strives to accommodate growth in a responsible and sustainable manner. With regard to land use and transportation, this involves a need to balance property owners' rights to develop their land and the City's goal to plan for and provide a transportation system that serves its intended function in a safe, reliable, and predictable manner for the public.

It should be noted that the transportation system includes "transportation facilities" as defined by OCMC 17.04.1312 which more commonly include the roadway, sidewalk, and offsite pathways for vehicles, bicycles, pedestrians, transit, freight, and other modes of transportation.

The City adopted its Transportation System Plan (TSP) in 2001 and was updated on August 16, 2013, outlining a plan to provide a multi- modal transportation system to accommodate expected growth through year 2035.*The Guidelines for Transportation Impact Analyses* are consistent with the TSP Goals (summarized below):

1. **Health and Safety:** *Enhance the health and safety of residents*
   Ensure that the transportation system maintains and improves individual health and safety by maximizing the comfort and convenience of multi-modal transportation options in the City.
2. **Effective and Efficient:** *Emphasize effective and efficient management of the transportation system*
   Optimize travel capacity and improve travel conditions by better managing residents' travel demands, meeting more daily needs within our own community, making transportation facilities as smart and efficient as possible, and being strategic about transportation investments.
3. **Sustainability:** *Foster a sustainable transportation system*
   Build a transportation system that is environmentally and fiscally sustainable and that focuses on decreasing vehicle emissions and transportation related greenhouse gas emissions.
4. **Equitable, Balanced, and Connected:** *Provide an equitable, balanced, and connected multi-modal transportation system.*
   Provide a complete transportation system throughout Oregon City that provides multi-modal travel options and connects people to jobs, schools, services, recreation, social and cultural institutions within the City.
5. **Fundable:** *Identify solutions and funding to meet system needs.*
   The City will identify transportation investments that can be made with available funding to accommodate community growth.
6. **Convenient and Available**: *Increase the convenience and availability of pedestrian, bicycle, and transit modes.*
   Strengthen the pedestrian and bicycle systems in all areas of the City, and work with local transit providers such as TriMet, Canby Area Transit (CAT), South Clackamas Transportation District (SCTD), etc. to cost-effectively improve coverage and frequency to achieve greater ridership productivity.
7. **Prosperity:** *Ensure the transportation system supports a prosperous and competitive economy.*
   Support a prosperous and competitive economy by preserving and enhancing business opportunities and ensuring the efficient movement of people and goods.
8. **Compliant:** *Comply with state and regional transportation plan.*
   The City will meet the requirements of state and regional transportation plans, such as the Oregon Transportation Planning Rule, the Oregon Highway Plan, the Metro 2035 Regional Transportation Plan (RTP) and the Metro Regional Functional Transportation Plan (RFTP).

In addition, *The Guidelines for Transportation Impact Analyses* are intended to be consistent with the provisions of the Oregon City Municipal Code (OCMC); however, if differences or conflicting language are found, the OCMC governs.

1.2 THE NEED FOR TRANSPORTATION ANALYSES FOR INDIVIDUAL DEVELOPMENTS

The City's development review process is designed to help the City achieve its goal of managing growth in a

responsible and sustainable manner. The applicant for development is required to submit full and accurate information upon which the City staff and elected officials can base decisions. A developer-submitted transportation study prepared by a professional engineer qualified in the traffic engineering field is a critical tool used by the City to assess the expected transportation system impacts associated with a proposed development and the long-term viability of the transportation system. A study must highlight development-specific issues, present a mitigation plan to mitigate for traffic impacts, and alert the City to the potential need to program specific projects from the TSP into the Capital Improvement Program (CIP).

1.3 THE LEVEL OF ANALYSIS AND DOCUMENTATION

This document establishes analysis and submittal requirements for developments in accordance with their expected transportation impacts. Under certain conditions, the City allows a lesser level of analysis and documentation for small developments. In addition, other developments meeting specific criteria are exempted from long-range analyses.

The City's overriding concern, as stated in Oregon City Municipal Code (OCMC) 17.02.015, is "to promote public health, safety, and general welfare through standards and regulations…and to facilitate adequate provision for transportation…." It is the responsibility of the applicant to help the City achieve this goal through the analysis and submittal of appropriate documentation.

2.0 OVERVIEW

2.1 DIFFERENT DOCUMENTATION FOR DIFFERENT DEVELOPMENT PROPOSALS

This document describes the City's required content for a **Transportation Analysis Letter** (TAL) and for a **Transportation Impact Study** (TIS). In general terms, the TAL is applicable to smaller developments that are presumed to have a lesser transportation impact. The TIS applies to larger developments that are presumed to have a greater transportation impact.

Whether the development requires a TAL or a TIS, a professional engineer must prepare it and must use appropriate data, methods, and standards. TAL and TIS documents share many common elements, but the scope of TALs is more limited. Furthermore, there will be more variability in the scope for TISs depending on the type, location, and size of the development being proposed.
Section 3.1 provides criteria used to determine whether a TAL or TIS is required.

2.2 CONTENT OF TRANSPORTATION IMPACT ANALYSES GENERALLY

Transportation analyses, whether conducted to support a TAL or a TIS, are required to provide an objective assessment of the potential multi-modal transportation impacts associated with a specific land use action (e.g., the development of vacant land, the redevelopment of an existing land use, a comprehensive plan amendment or zoning change). The analysis and the documentation provided by the applicant must help answer several important transportation related questions including:

- Will the existing transportation system accommodate the proposed development from a capacity and safety standpoint?
- What on-site and off-site transportation system improvements will be necessary to accommodate the proposed development?
- How will access to the proposed development affect the traffic operations on the existing transportation system and how will each study area intersection operate relative to the city's mobility standards?
- How will transportation impacts of the proposed development impact the land uses, including commercial, institutional, industrial, and residential uses within the development's influence area?
- How will the proposed development meet current city standards for roadway design?
- How will the proposed development ensure the safe and efficient circulation on and adjacent to the site?
- How will the proposed development provide needed connections to abutting parcels (developed or undeveloped) for motorized as well as non-motorized traffic?
- What TSP projects or elements of TSP projects and projects consistent with and derived from specific polices in the TSP will be needed to accommodate the proposed development?

- If the development or certain public improvements are proposed to be completed in phases, how will the various phases impact the transportation system throughout the development timeline, and how will the future phases be developed?

2.3 RESPONSIBILITIES OF THOSE PREPARING TRANSPORTATION ANALYSES GENERALLY

The responsibility for assessing the traffic impacts associated with a proposed land use action rests with the landowner or land use permit applicant. Transportation analyses submitted to the City must be prepared by or under the direct supervision of a Professional Engineer with competence in traffic engineering and registered in the State of Oregon. The report shall be signed and stamped by the professional engineer.

Under state law, engineers shall recognize at all times that their primary obligation is to protect the safety, health, property and welfare of the public in the performance of their professional duties.

These Guidelines in no way serve as a substitute for the application of sound professional engineering judgement expected to be used by practitioners in the preparation and submittal of transportation analyses.

2.4 RESPONSIBILITIES AND AUTHORITY FOR THE CITY

Throughout this document the term "City Engineer" is used as the individual with authority for certain actions and for interpretation of aspects of these guidelines. For the purposes of this document, the term "City Engineer" should be taken to mean the "City Engineer or his/her designee including but not limited to designated staff or City consultant." The City's review of the TAL or TIS shall include a Professional Traffic Engineer registered in the State of Oregon or a Professional Engineer registered in the State of Oregon qualified to perform traffic engineering as defined by OAR 820-040-0030.

3.0 TRANSPORTATION IMPACT ANALYSIS DOCUMENTS

An analysis and appropriate documentation is generally required when a development application and/or application for re-zoning is filed with the City. A transportation impact analysis (TIA) is required when application is made for land to be subdivided as provided for in OCMC 16.12; when application is made for a conditional use as specified in OCMC 17.56; and when application is made for a change in zoning districts as provided for in OCMC 17.68.

A transportation analysis is not required for modification of a single-family dwelling, construction of a replacement dwelling, accessory dwelling unit (ADU), lot line adjustment, or an application for work in the right of way. In most other circumstances and for most other development applications, some level of transportation analysis is required.

Recognizing that not all developments will have a significant impact on the transportation system, these guidelines include criteria to help determine the need for and level of transportation analysis required in relation to the proposed development.

3.1 DETERMINING THE REQUIRED LEVEL OF TRANSPORTATION ANALYSIS AND DOCUMENTATION

A Transportation Impact Study (TIS) is required for developments that are expected to have an impact on the transportation system. When specific criteria generally associated with small developments are met, a Transportation Analysis Letter (TAL) may be substituted for the required TIS.

At the discretion of the City Engineer, a TAL may satisfy the City's transportation analysis requirements, in lieu of a TIS, when a development meets all of the following criteria:

A. The development generates fewer than 24 peak hour trips during either the AM or PM peak hour and fewer than 250 daily trips.
Examples of common developments generating fewer trips than these threshold levels are: a subdivision

containing 24 or fewer single-family residences, a general office building less than 15,000 square feet, a multi-family building with 42 or fewer units, or any proposed partition.

B. The development is not expected to further impact intersections that currently fail to meet the City's mobility standards or intersections that are operating near the limits of the acceptable thresholds during a peak operating hour. (Mobility standards are defined in 7.9.1)
C. The development is not expected to significantly impact adjacent roadways and intersections that are high accident locations, areas that contain an identified safety concern, or high concentration of pedestrians or bicyclists such as school zones

The specific requirements for and content of a TAL are contained in Section 5.0. The specific requirements for and content of a TIS are contained in Section 6.0.

4.0 PROCESS AND PROCEDURES

This section describes in general terms the process and procedures followed by the City in relation to the processing and review of transportation impact analyses. Nothing in this section is intended to replace or supercede the City's process, code requirements, or obligations under state law with regard to land use actions.

4.1 PRE-APPLICATION MEETING

A landowner or developer seeking to develop/redevelop property shall contact the City and schedule a pre-application meeting as required by OCMC 17.50.050. The City's pre-application form specifies the City's requirements applicable to land use actions. An applicant should be prepared to present, preferably in writing, the following:

- type of uses within the development
- the size of the development
- the location of the development
- proposed new accesses or roads
- estimated trip generation and source of data
- proposed study area

4.2 ESTABLISHING THE SCOPE OF WORK

During, or within a reasonable time following the pre-application meeting, the City will establish whether a TAL or TIS is required. (See Section 3.1). If a TIS is required, the City will provide a scoping summary detailing the study area and any special parameters or requirements beyond the requirements set forth in this document. An applicant is encouraged, but not required, to propose a scope of work and a study area using the guidance presented in Section 7.2.

4.2.1 Potential for Expansion of the Scope of Work

In the scoping summary the City will establish expectations and a study area within which significant impacts of the development are expected. The City's final decision on the land use criteria cannot be bound by the specifications or limitations in the scoping summary because additional information or concerns may come to light over the course of the analysis that causes the City to require additional analysis or information. Ultimately, it is the applicant's responsibility to demonstrate compliance with the criteria in the Oregon City code.

The City Engineer reserves the right to require additional analysis, especially when the need for such analysis becomes evident from information gathered by or presented by the applicant. The applicant's engineer should be alert to this possibility and expand his/her scope of work to address issues, especially those of public safety, or at least advise the City of such issues if they arise.

The City Engineer may at his/her discretion expand the requirements and/or study area of a TIS or TAL if needed to address any issue that comes to light after the preparation of the scoping summary.

4.2.2 Time Limit on the Scoping Summary

The City's scoping summary and review requirements are to be considered valid for a reasonable period of time, but are not to be considered binding on the city. Applicants are advised that delays of more than a few months before submitting TAL or TIS documents significantly increases the likelihood that the City will need additional information to adequately evaluate the impacts of a proposed development.

4.3 COMPLETENESS REVIEW

Upon completion of the TIS or TAL, the applicant will submit the number of copies specified by the City in accordance with OCMC 17.50.080 to the City for review. At that time, City staff will perform an initial review of the document to determine whether there are obvious omissions or concerns. The City will rely upon and make use of the TIS checklist, described in more detail in Section 9.0.The lack of a submission of a TIS or TAL will result in a determination of "Incomplete".

A determination of Completeness is not a determination that the applicant's data, methods, accuracy of the analysis, or conclusions and recommendations are valid.

Once the overall development application, including the required TAL or TIS, as appropriate, is deemed "complete," the 120-day land use review process will begin.

4.4 TECHNICAL REVIEW

Once the land use review process is initiated, the City Engineer will conduct a technical review of the TIA to determine the adequacy and quality of the work including, but not limited to the study data sources, methods, findings and recommendations. The City Engineer and/or his/her designee(s) will provide findings for use by the City regarding expected transportation impacts from the proposed development.

If substantive errors or omissions are discovered during review, the applicant will be notified and asked to address the comments prior to a land use decision. The applicant should promptly rectify omissions and respond with any additional analysis or information; a delay or refusal to respond may result in the denial of an application if the information and analysis submitted is insufficient to show compliance with the applicable criteria.

The lack of specificity on the part of the City in the scoping summary or confusion in its interpretation does not alter the applicant's responsibility to perform a thorough and comprehensive transportation analysis nor does it preclude City decision maker from determining that a TAL or TIS that fully complies with the scoping requirement is insufficient to show compliance with all applicable criteria.

Issues or problems discovered during the Technical Review may, at the discretion of the City's decision maker, be resolved through the use of condition of approval.

5.0 TRANSPORTATION ANALYSIS LETTER CONTENTS

If the City determines based on information provided by the applicant and in accordance with the criteria specified in Section 3.1 that a TAL is the appropriate document to submit, the following requirements shall apply.

The TAL shall be prepared by or prepared under the direct supervision of a Professional Engineer registered in the State of Oregon who shall sign and stamp the TAL.
The TAL shall include the following:

1. The expected trip generation of the proposed development including the AM peak hour, the PM peak hour, daily traffic, and other germane periods as may be appropriate, together with appropriate documentation and references.
2. Site plan showing the location of all access driveways, private streets, or alleys where they intersect with public streets plus driveways of abutting properties and driveways on the opposite side of the street from the proposed development. Dimensions of driveway spacing as measured at the right of way from edge to edge

of driveway shall be shown and shall meet or exceed the minimum driveway spacing standards.
3. Site plan showing width of all driveways and shall meet Oregon City Driveway Approach Size Standards.
4. Site plan showing that all public roads meet Oregon City's Street Design Standards including alignment, intersection angles, cul-de-sacs, and block standards.
5. Documentation that all new site accesses and/or public street intersections meet AASHTO intersection sight distance guidelines.
6. Preliminary analysis that all new streets comply with traffic sight obstructions in OCMC 10.32.
7. Documentation that there are no inherent safety issues associated with the design and location of the site access driveways.
8. Documentation that the applicant has reviewed the City's TSP and that proposed streets and frontage improvements do or will comply with any applicable standards regarding the functional classification, typical sections, access management, traffic calming and other attributes as appropriate.
9. When required of the development, documentation that no inherent safety issues are associated with the design and location of pedestrian, bicycle, or transit safety.

6.0 TRANSPORTATION IMPACT STUDY (TIS) CONTENTS

The following information shall be included in each TIS submitted to the City. Additional information specified by the City in the scoping summary or through the pre-application meeting or other project meetings shall also be included.

1. Table of Contents – Listings of all sections, figures, and tables included in the report.
2. Executive Summary – A summary of key points, findings, conclusions, and recommendations including a mitigation plan.
3. Introduction:
   - Proposed land use action including site location, zoning, building size, and project scope.
   - Map showing the proposed site, building footprint (s), access driveways, and/or parking facilities.
   - Map of the study area that shows site location and surrounding roadway facilities
4. Existing Conditions:
   - Existing site conditions and adjacent land uses.
   - Roadway characteristics of transportation facilities located within the study area, including roadway functional classifications, street cross-section, posted speeds, general sight distance, bicycle and pedestrian facilities, on-street parking, and transit facilities.
   - Existing lane configurations and traffic control devices at the study area intersections.
   - Existing traffic volumes and operational analysis of the study area roadways and intersections.
   - Roadway and intersection crash history analysis.
   - Intersection and stopping sight distance related to new and impacted (existing) driveways and intersections.
5. Background Conditions (without the proposed land use action)
   - Approved in-process developments and funded transportation improvements in the study area.
   - Traffic growth assumptions.
   - Addition of traffic from other planned developments.
   - Background traffic volumes and operational analysis.
6. Full Buildout Traffic Conditions (with the proposed land use action)
   - Description of the proposed development plans.
   - Trip generation characteristics of proposed project (including trip reduction documentation).
   - Trip distribution assumptions.
   - Full buildout traffic volumes and intersection operational analysis including the performance relative to the applicable mobility standards for each intersection.
   - Site circulation and parking.
   - Intersection and site-access driveway queuing analysis. Recommended roadway and intersection

mitigation measures (if necessary).

7. Conclusions and recommendations
8. Appendix- With dividers or tabs
    - Traffic count summary sheets.
    - Crash analysis summary sheets.
    - Existing, Background, and Full Buildout traffic operational analysis worksheets with detail to review capacity calculations.
    - Signal, left-turn, and right-turn lane warrant evaluation calculations.
    - Intersection analysis – Roundabout vs. Traffic Signal
    - Other analysis summary sheets such as queuing.

To present the information required to analyze the transportation impacts of development, the following figures shall be included in the TIS:

1. Vicinity Map
2. Existing Lane Configurations and Traffic Control Devices
3. Existing Traffic Volumes and Levels of Service for each required time period
4. Future Year Background Traffic Volumes and Levels of Service for each required time period
5. Proposed Site Plan, including access points for abutting parcels and for those across the street from the proposed development
6. Future Year Assumed Lane Configurations and Traffic Control Devices
7. Estimated Trip Distribution/Assignment Pattern
8. Trip reductions (pass-by trips at site access (es))
9. Site-Generated Traffic Volumes for each required time period
10. Full Buildout Traffic Volumes and Levels of Service for each required time period

7.0 STANDARDS AND PROCEDURES

To help ensure consistency in the preparation and review of each TIS and TAL, the City of Oregon City has established a set of guidelines and procedures. These standards and procedures include the following:

- Preparer qualifications
- TIS study area
- Analysis years and time periods
- Data collection guidelines
- Trip generation guidelines
- Trip distribution and assignment guidelines
- Minimum intersection operational standards
- Minimum access spacing standards
- Other analysis guidelines

7.1 PREPARER QUALIFICATIONS

Each TIS and TAL shall be prepared by or under the direct supervision of a Professional Traffic Engineer registered in the State of Oregon or a Professional Engineer registered in the State of Oregon qualified to perform traffic engineering as defined by OAR 820-040-0030. The engineer must have background and experience in the methods and concepts associated with transportation impact studies. Each TIS and TAL shall be sealed and signed by the Professional Engineer registered in the State of Oregon prior to acceptance by the City for a technical review.

7.2 TIS STUDY AREA

Each TIS shall include a vicinity map that shows the site, the study area, and the surrounding transportation system. A brief description of the site location and study area shall be provided. The study area shall be based on engineering judgement and an understanding of existing and future land use and traffic conditions in the

vicinity of the site. The following considerations shall form the basis of establishing the study area.
The following facilities shall be included in the study area for all TIS's:

- All site-access points and intersections (signalized and unsignalized) adjacent to the proposed site. In particular, if the proposed site fronts an arterial or collector street, the analysis shall address all intersections and driveways along the site frontage, including those serving parcels on the opposite side of the street(s) and parcels directly adjacent to the proposed development.
- Roads through and adjacent to the proposed development.
- Any intersection of two streets, each with a classification of collector or arterial, where site traffic will exceed 20 vehicles during a peak hour or, in the case of a rezone, if the trip differential resulting from the rezone will exceed 20 vehicles during a peak hour.
- All intersections needed for signal progression analysis

As indicated in Section 4.1, the applicant is encouraged to propose a study area at the pre-application meeting or in response to the discussions between the applicant and the City's representatives.

In addition to these requirements, the City Engineer may determine any additional intersections or roadway links that may be adversely affected as a result of the proposed development. The applicant reduces his risk of having an adverse staff report if the applicant reaches agreement with the City Engineer prior to the start of the transportation impact analysis.

7.3 ANALYSIS YEARS TO BE ANALYZED IN THE TIS

To adequately assess the impacts of a proposed land use action, several study periods should be addressed in the transportation impact analysis. These study periods or horizon years consist of the following:

- **Existing Year**
- **Background** – The conditions in the year in which the proposed land use action will be completed and occupied, but without the expected traffic from the proposed land use action. This analysis should include all in-process developments, or city approved developments that are expected to be fully built out in the proposed land use action horizon year. It should also account for all in-process/planned transportation system improvements.
  Note: Depending on funding or project development issues, it may not be appropriate to assume that certain planned transportation system improvements will be in place on opening day. Applicants should contact the City Engineer to confirm appropriate assumptions.
- **Full Buildout –** The background condition plus traffic from the proposed land use action assuming full build-out and occupancy.
- **Phased Years of Completion** – If the project involves construction or occupancy in phases or for master plans, the applicant is expected to assess the expected roadway, intersection, and land use conditions resulting from major development phases. Phased years of analysis will be determined in coordination with City staff.
- **20-Year or TSP Horizon Year** – For master plans, zone changes, and conditional uses, the applicant shall assess the expected future roadway, intersection, and land use conditions resulting from deviations from approved comprehensive planning documents.

A twenty-year or TSP Horizon Year analysis will not be required for the following development proposals:

- For out-right permitted uses under the current zoning.
- For residential-to-residential rezoning proposals when the rezoning produces an increase of twenty-five (25) or fewer peak hour trips.

7.4 ANALYSIS PERIODS TO BE ANALYZED IN THE TIS

Within each analysis year, specific consideration should be directed to the time period(s) that experience the highest degree of network travel. These periods typically occur during the weekday morning (7:00AM to 9:00AM) and weekday evening (4:00 PM to 6:00 PM) peak commuting hours.

The TIS shall address the weekday AM and PM peak hours when the proposed land use action is expected to generate 25 trips or more during the peak time periods. If the applicant can demonstrate that the peak hour trip generation of the proposed land use action is fewer than 25 trips during one of the two peak study periods and the peak trip generation of the land use action corresponds to the roadway system peak, then only the worse of the two peak periods must be analyzed. This does not mean, however, that all aspects of the other peak period can be ignored. The applicant should consider, for example, the possibility that inbound and outbound trips at the site driveway have specific operational issues that may need to be addressed for both peak hours.

Depending upon the proposed land use action and the expected trip generating characteristics of that development, other time periods may be specified, either as a substitute for, or in addition to the AM and PM peak hours. Examples of land uses that have non-typical trip generating characteristics include schools, restaurants, movie theatres, nightclubs, and churches. Applicants should assume that the City will require additional analysis periods for certain uses as summarized below:

- Schools – End of the school day (early afternoon) peak hour
- Churches and worship facilities – Peak period prior to and after worship services.
- Restaurants – Mid-day weekday peak hour
- Shopping centers, home improvement centers, superstores, and retail facilities of more than 60,000 square feet – Saturday peak hour.

When the additional hours for analysis are specified, the applicant need not necessarily carry the analysis through all steps if the data and the engineer's analysis shows that some time periods clearly represent the worst case. If, for example, the mid-day peak period traffic volumes at a restaurant are lower than the other peak periods, except at the site driveway, the mid-day peak need only be analyzed for the driveway location. The engineer preparing the TIS is advised to provide thorough documentation of the reasons for reducing the scope of the extra time periods. The applicant may choose to bring such issues to the attention of the City Engineer for discussion prior to submittal of the TIS.

The above list is not necessarily an all-inclusive list of uses for which additional analysis periods is required. The City Engineer and applicant should discuss the potential for additional study periods prior to the start of the transportation impact analysis.

7.5 APPLICATIONS INVOLVING ZONE CHANGES

In the case of a land use proposal involving a zone change, the TIS must analyze a 20-year horizon period as required by the Oregon Transportation Planning Rule (TPR) and may require interim years in the case of a master plan that also requires a zone change. Applicants seeking a rezoning are advised that in addition to any requirements specified by the City, it is their obligation to address requirements in OAR 660-12-0060. The City's exemption from the requirement for 20-year analysis for certain rezoning actions as specified in Section 7.3 may not exempt the applicant from addressing TPR requirements.

For proposals involving rezoning, the applicant shall compare the traffic generated by his/her development proposal, a reasonable worst-case development under the proposed zoning and a reasonable worst-case development under current zoning.

7.6 TRAFFIC COUNT REQUIREMENTS

Once the TIS study area and analysis periods have been determined, turning movement counts shall be collected at all study area intersections to determine the base traffic conditions. These turning movement counts should typically be conducted during the weekday (Tuesday through Thursday) between 7:00 a.m. – 9:00 a.m. and 4:00 p.m. – 6:00 p.m. and for other periods depending upon the proposed and/or surrounding land uses. Historical turning movement counts may be used if the data is not more than 12 months old at the time the TIS is deemed complete for review. Historical counts shall be factored accordingly to meet the existing traffic conditions. In high traffic locations where congestion is present or traffic peaks early or late, extended or altered count periods may be required.

7.7 TRIP GENERATION FOR THE PROPOSED DEVELOPMENT

To determine the impacts of a proposed development on the surrounding transportation network, the trip generation characteristics of that development must be estimated. Trip generation characteristics should be obtained from one of the following acceptable sources:

- Institute of Transportation Engineers (ITE) *Trip Generation* (latest edition).
- Specific trip generation studies that have been conducted for the particular land use for the purposes of estimating peak hour trip generating characteristics, subject to approval by the City Engineer prior to their inclusion in the transportation impact analysis.

In addition to new site generated trips, several land uses typically generate additional trips that are not added to the adjacent traffic network. These trips include pass-by trips and internal trips and are considered to be separate from the total number of new trips generated by the proposed development. The procedures listed in the (ITE) *Trip Generation Handbook* should be used *where appropriate* (emphasis added) to account for pass-by trips and internal trips. The applicant's engineer shall not use any pass-by or internal trip reductions with prior approval of the method or data sources by the City Engineer.

Special Attention Items

The ITE *Trip Generation Handbook* maintains limited data regarding pass-by, diverted-linked, and internal shared trip-making characteristics. Professional judgment needs to be used in applying this data. For example, it is not appropriate to apply PM peak hour pass-by percentages to AM or daily periods where AM and daily percentages do not exist. Also, ITE's internal shared trip characteristics are based on a limited number of studies from the early 1990's in Florida. These sites included a mix of commercial, residential, retail, and other uses. For developments that contain only one or two of these uses, a maximum shared trip reduction of five (5) percent will be allowed without appropriate justification and supporting data from the applicant.

The ITE *Trip Generation Handbook* outlines specific guidelines for use of weighted average trip rates versus regression equations. These guidelines shall be followed unless the applicant provides valid justification for deviation.

7.8 TRIP DISTRIBUTION AND ASSIGNMENT

Estimated site generated traffic for the proposed development should be distributed and assigned to the existing or proposed arterial and collector street network. Trip distribution methods should be based on a reasonable assumption of local travel patterns and the locations of off-site origin/destination points within the site vicinity. Acceptable trip distribution methods should be based on one or more of the following procedures:

- A select zone analysis of the proposed site can be obtained from METRO's regional planning model. When using the regional planning model for distribution purposes, the engineer preparing the TIS should make sure that the model assumes the proper existing and future year land use and zoning designations and that he/she understands model load points (centroid connectors). The applicant should also be aware that Metro's model is a regional model and that professional judgement must be applied when using it for specific developments.
- An analysis of local traffic patterns and intersection turning movement counts can be used as long as the data has been gathered within the previous twelve months.
- A detailed market study specific to the proposed development and surrounding land uses may be used to determine the specific influence area. Site generated traffic within the identified influence area should be distributed based on principles and concepts associated with the gravity model theory. Note that if a market study is to be used as a basis for trip distribution, the entire market study must be made available to the City and it shall become part of the public record and, as such, any client confidentiality is lost.

Special Attention Items

In the case of retail developments, the applicant shall clearly distinguish between pass-by and non- pass-by trips to allow the reviewer to understand how the pass-by trips were accounted for and applied throughout the study

area. The treatment of pass-by trips at the site entrance may be most easily addressed through separate figures depicting the total site trips and the individual pass-by and non-pass-by components.

7.9 INTERSECTION OPERATIONAL STANDARDS

To assess the impacts of the proposed land use action on the transportation system, the TIS shall compare the existing, background, and full buildout intersection traffic volumes to the minimum intersection operational standards.

The City of Oregon City evaluates intersection operational performance based on the volume-to-capacity ratio (v/c) or the Level of Service (LOS) as defined in the *Highway Capacity Manual (HCM)* published by the Transportation Research Board depending on the specifics of the intersection and location
All LOS definitions should be consistent with the most recent version of the *HCM*. The v/c ratio used by Oregon City is based on the Oregon Department of Transportation's *Analysis Procedures Manual*.

7.9.1 Intersection Level of Service Standards

The City of Oregon City requires all intersections within the study area to maintain an acceptable performance upon full buildout of the proposed land use action as defined below.

Development shall demonstrate compliance with intersection mobility standards. When evaluating the performance of the transportation system, the city of Oregon City requires all intersections, except for the facilities identified in subsection E below, to be maintained at or below the following mobility standards during the two-hour peak operating conditions. The first hour has the highest weekday traffic volumes and the second hour is the next highest hour before or after the first hour. Except as provided otherwise below, this may require the installation of mobility improvements as set forth in the transportation system plan (TSP) or as otherwise identified by the city engineer.

A. For intersections within the regional center, the following mobility standards apply:
    1. During the first hour, a maximum v/c ratio of 1.10 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
    2. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
    3. Intersections located on the regional center boundary shall be considered within the regional center.
B. For intersections outside of the regional center but designated on the arterial and throughway network, as defined in the regional transportation plan, the following mobility standards apply:
    1. During the first hour, a maximum v/c ratio of 0.99 shall be maintained. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.
C. During the second hour, a maximum v/c ratio of 0.99 shall be maintained at signalized intersections. For signalized intersections, this standard applies to the intersection as a whole. For unsignalized intersections, this standard applies to movements on the major street. There is no performance standard for the minor street approaches.For intersections outside the boundaries of the regional center and not designated on the arterial and throughway network, as defined in the regional transportation plan, the following mobility standards apply:
    1. For signalized intersections:
        a. During the first hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements.

2. During the second hour, LOS "D" or better will be required for the intersection as a whole and no approach operating at worse than LOS "E" and a v/c ratio not higher than 1.0 for the sum of the critical movements. For unsignalized intersections outside of the boundaries of the regional center:
    a. For unsignalized intersections, during the peak hour, all movements serving more than twenty vehicles shall be maintained at LOS "E" or better. LOS "F" will be tolerated at movements serving no more than twenty vehicles during the peak hour.

D. For the intersection of OR 213 and Beavercreek Road, the following mobility standards apply:
    1. During the first, second and third hours, a maximum v/c ratio of 1.00 shall be maintained. Calculation of the maximum v/c ratio will be based on an average annual weekday peak hour.

E. Until the city adopts new performance measures that identify alternative mobility targets, the city shall exempt proposed development that is permitted, either conditionally, outright, or through detailed development master plan approval, from compliance with the above-referenced mobility standards for the following state-owned facilities:

I-205/OR 99E Interchange.

State intersections located within or on the regional center boundaries.

1. In the case of conceptual development approval for a master plan that impacts the above references intersections:
    a. The form of mitigation will be determined at the time of the detailed development plan review for subsequent phases utilizing the code in place at the time the detailed development plan is submitted; and
    b. Only those trips approved by a detailed development plan review are vested.
2. Development which does not comply with the mobility standards for the intersections identified in OCMC 16.12.033 shall provide for the improvements identified in the transportation system plan (TSP) in an effort to improve intersection mobility as necessary to offset the impact caused by development. Where required by other provisions of the code, the applicant shall provide a traffic impact study that includes an assessment of the development's impact on the intersections identified in this exemption and shall construct the intersection improvements listed in the TSP or required by the code.

7.9.2 Intersection Design Features and QueuingCalculations

The TIS shall contain sufficient data and information derived from the traffic analysis to provide the roadway/intersection designer and City staff with information on which to assess intersection design features such as the length of storage required for lanes on each approach.

Queue lengths shall be calculated for each lane of all approaches to signalized intersections for the 95^{th} percentile queue. Queue lengths shall also be calculated for unsignalized locations, such as site driveways, where standing queues can interfere with other movements, especially if such interference can contribute to safety problems. Appropriate analysis methods should be used that account for the actual arrivals of vehicles at an intersection.

Special Attention Items

The applicant's engineer shall use professional judgment in selecting the appropriate analysis tools and methods for evaluation of intersection operations. The HCM, for example, states "The [HCM] methodology does not take into account the potential impact of downstream congestion on intersection operation. Nor does the methodology detect and adjust for the impacts of turn-pocket overflows on through traffic and intersection operation." If these conditions are present or can reasonably be expected to exist as a result of the proposed development, the applicant's engineer shall supplement his/her initial analysis with other analysis tools and methods that account for such conditions.

The applicant's engineer also must use reasonable signal timing and consider corridor timing plans where appropriate.

When calculating queues, Poisson distribution may be used for locations subject to random arrivals. Other analysis methods shall be used where signal systems cause different arrival patterns and when congestion causes accumulation from one cycle to the next. Queue lengths shall be based on average vehicle length of twenty-five (25) feet, or longer where appropriate.

7.10 ACCESS SPACING STANDARDS

Access locations on roadway sections must be located to ensure safe and efficient travel along a transportation facility to limit potential conflicting turning movements, weaving maneuvers over short distances, and congestion along facilities. Access management standards vary depending upon the functional classification and purpose on a given roadway. Roadways in the upper echelon of the functional classification system (i.e. arterials) tend to have stringent spacing standards, while facilities ranked lower in the functional classification system allow more closely spaced accesses.

The applicant shall use the standards in OCMC 16.12 and discuss whether the following standards are met through their proposed development:

- Minimum city street intersection spacing (the distance between adjacent intersections),
- Minimum private access spacing (the distance between adjacent driveways and between driveways and street intersections),
- Minimum traffic signal spacing (the distance between adjacent signalized intersections),
- Minimum private access driveway widths (the measurement of the individual driveway surface)

Exception Process:

In cases where physical constraints or unique site characteristics limit the ability for the above access spacing standards to be met, the City decision maker may grant an access spacing exception. Typically, access exceptions are available only for a parcel whose roadway frontage, topography, or location would otherwise preclude issuance of a conforming permit and the parcel would either have no reasonable access or cannot otherwise obtain reasonable alternate access to the public road system. However, if the limitation or condition is one that the applicant or owner has contributed to by any previous subdivision of property, sale, building activity, or site development, the limitation or condition shall not constitute a basis for an access exception. Note also that the City may choose to prohibit some movements (e.g. left turns) at the site access location, especially if such access is in a location where an access exception is needed.

When an exception is required, the transportation impact analysis must show that the new access will not adversely impact the existing transportation system. A high burden is placed on the applicant and his/her engineer to prove that the system will not be adversely impacted and that public safety will not be compromised.

7.11 SIGHT DISTANCE

For all new proposed site driveways and public street intersections, an evaluation of stopping sight distance (SSD) and intersection sight distance (ISD) shall be conducted consistent with procedures outlined in the current version of the AASHTO *Policy on Geometric Design of Highways and Streets.* At the discretion of the City Engineer, the applicant may be exempted from a need to assess sight distance.

The City standard for new driveways and intersections requires that ISD meet the minimum distance specified in AASHTO. The applicant may apply for a design exception allowing a driveway or intersection that meets SSD rather than ISD. A high burden is placed on the applicant and his/her engineer to prove that the system will not be adversely impacted and that public safety will not be compromised. The City Engineer may grant a design exception if the following conditions are met:

1. The intersection or driveway is proposed to intersect with a local or neighborhood collector street (not a major collector or arterial street), and
2. The approach is forecast to serve fewer than forty (40) vehicles per day, and
3. The intersection will not adversely impact the existing transportation system.

The City Engineer may also grant a design exception if the intersection is forecast to serve less than 100 vehicles per day for a period of not more than twenty-four (24) months. Should the City Engineer choose to grant a design exception, he/she may place additional conditions on the applicant, such as, but not limited to placement of warning signs or the use of flaggers for manual traffic control as prescribed by the *Manual on Uniform Traffic*

Control Devices (MUTCD).

Special Attention Items
Under AASHTO procedures, intersection sight distance is evaluated based on the roadway design speed – not the roadway posted speed. Where design speed is not known, it shall be estimated using procedures outlined in the AASHTO *Policy on Geometric Design of Highways and Streets*. This generally results in a design speed anywhere from 5 to 10 mph above prevailing posted speed.

7.12 CRASH HISTORY
Within the study area for each TIS, a crash history evaluation shall be conducted for the most recent four-year period. The intent of the evaluation is to identify any apparent trends in the data that reflect a safety issue that may be exacerbated by the proposed development and to identify mitigation to resolve the issue(s). At a minimum, the analysis shall summarize the number of crashes per year by type and severity. Intersection crash rates shall be calculated and evaluated. The engineer shall assess the overall results of the safety analysis.

7.13 SAFE ROUTES TO SCHOOL
For proposed residential developments, the TIS shall include a brief discussion of routes to the nearest schools. The applicant shall identify the primary walking/biking route between the proposed development and the nearest elementary, middle, and high school. Specifically, the applicant shall describe the general bicycle and pedestrian environment between the proposed development and each school, including the presence and condition of pedestrian and bicycle facilities and the roadway environment (speed, lanes, etc.) along the routes. This section requires applicants to address the special need to link residential areas to area schools.

7.14 WARRANTS (TURN LANE, TRAFFIC CONTROL)
The following section provides guidance on evaluating turn lane and traffic signal warrants.

7.14.1 Traffic Control Warrants
An evaluation of traffic signal warrants shall be conducted for all unsignalized study area intersections where any approach is shown to operate at LOS E or worse under existing, background, or total traffic conditions. Signal warrant analysis shall be conducted in accordance with the current version of the *Manual on Uniform Traffic Control Devices for Streets and Highways* (MUTCD).

Warrants to evaluate conversions between yield control, two-way STOP control, and multi-way- STOP control shall, as deemed necessary by the applicant's traffic engineer, comply with the MUTCD.

Special Attention Items
The reduction of minor street right turns is an important factor in evaluating traffic signal warrants and care must be taken to ensure the practice is not overlooked or improperly applied as it can affect warrant determinations. Both the MUTCD and the National Cooperative Highway Research Program (NCHRP) Report 457- *Evaluating Intersection Improvements: An Engineering Study Guide*, 2001 offer detailed discussions of the proper methods to address right turn reductions.

For state highways, ODOT's Transportation Planning Analysis Unit maintains specific guidelines regarding right turn reductions that shall be applied to highway intersections. Other methods such as delay-based reduction methods may be considered if reasonably explained and justified by the applicant.
The construction of a lane to accommodate right turns shall be considered as a mitigation measure before or in addition to the analysis of traffic signal warrants for the installation of a traffic signal.
Note that Warrant 3, Peak Hour according to the MUTCD "shall be applied only in unusual cases." The burden of proof is on the applicant that the case is truly unusual. The applicant must evaluate the conditions using other warrants before attempting to justify the use of the Peak Hour warrant.

7.14.2 Turn Lane Warrants
The provision of dedicated left- and right-turn lanes on the major approach to an unsignalized intersection can significantly improve operations and safety at an intersection. The provision of a second lane on minor street approaches at unsignalized intersections can significantly reduce side street delay for right-turning motorists.

The applicant's engineer shall exercise professional judgement in evaluating the need for, and benefits of, providing dedicated left-turn and right-turn lanes. Documentation of the engineer's analysis of turn lanes shall be provided in the TIS.

The following is a non-exclusive list of conditions where an evaluation of turn lanes is appropriate:

- When no lane is currently provided for left turns and when left turn movements from the major street are predicted to increase because of the proposed development. This is especially appropriate when a turn lane is included as part of the standard cross-section for a street of this classification in the *Transportation System Plan*.
- When an intersection has a crash rate above 1.0 crashes per million entering vehicles and includes crash types subject to improvement from a turn lane.
- When the speed and volume of through traffic and increases predicted in right turn volumes raise concerns in the engineer's professional judgment about safety or about impeding through traffic.
- When only a single lane is provided for minor street approaches and the approach LOS is calculated to be "E" or worse.

The following are some of the references that should be considered by the applicant's engineer.

- **State Highways –** The Oregon Department of Transportation (ODOT) maintains criteria that shall be used for evaluating development of left- and right-turn lanes along state highways at Unsignalized Grade Intersections.
- **Local Streets –** Much of the published information regarding warrant criteria are centered on highway facilities and practitioners have therefore applied these criteria to local streets. The applicant shall refer to pages 686-89 of the 2001 *AASHTO Policy on Geometric Design of Highways and Streets* when evaluating turn lane warrants. Specifically, the applicant shall draw from other sources [see sources 2, 11, 12, and 13] cited by AASHTO. This criteria shall be updated coinciding with future revisions to the AASHTO *Policy*. An additional resource not cited by AASHTO is the National Cooperative Highway Research Program (NCHRP) Report 457- *Evaluating Intersection Improvements: An Engineering Study Guide*, 2001.

8.0 COMMON ERRORS AND OMISSIONS

The following are some common errors and omissions. Special care should be taken to address these items that are part of the TIS requirements identified herein.

- Failure to include a crash analysis.
- Failure to conduct a warrant analysis or incorrect methods, particularly a failure to account for right turns from minor streets.
- Failure to address access spacing.
- Lack of discussion of observed traffic flow.
- Failure to address intersection and/or stopping sight distance.
- Failure to discuss bicycle, pedestrian and transit facilities.
- Failure to present justification for some assumptions.
- Failure to account for downstream congestion, turn-pocket overflow, or signal timing of adjacent traffic signals (particularly with regard to the selection of software analysis tools)
- Use of unrealistic signal timing
- Use of inappropriate tools and assumptions for calculation of queues.

TRANSPORTATION IMPACT STUDY CHECKLIST

Project Name: _____

City Reference Code: _____

Provided?		Page No.	
Yes	No	_____	Study Required Comment:_____ Date: _____
			BACKGROUND INFORMATION
Yes	No	_____	Oregon PE Stamp and Signature
Yes	No	_____	**INTRODUCTION AND SUMMARY**
			EXISTING CONDITIONS
Yes	No	_____	Roadway Network - summary of roadway classifications, lanes, speeds, transit service and facilities, alternative mode service and facilities (e.g., sidewalks, bike lanes, crosswalks) and description of study area
Yes	No	_____	Analysis Periods Correct (AM, Mid-day, PM Afternoon_, Saturday____,
Yes	No	_____	Existing Traffic Operations (Existing LOS, traffic volumes (new counts), speeds , crash data)
			IMPACTS
Yes	No	_____	Trip Generation - Daily, peak hour trips generated by site development
Yes	No	_____	Level of Service Analysis -projected LOS with site build out, existing, and background traffic growth
Yes	No	_____	Future year 20-year analysis required for zone change or conditional use
Yes	No	_____	Signal Warrant Analysis
Yes	No	_____	Turn Lane Warrant Analysis
Yes	No	_____	Access Spacing Standards
Yes	No	_____	Analysis of intersection and stopping sight distance at frontage road access point(s)
Yes	No	_____	Identify safe route to school or school bus stop (Contact with school district)
Yes	No	_____	Analysis of safe pedestrian/bicycle access to nearest transit stop (if within 1/2 mile of project site)
Yes	No	_____	Identify accessibility to public transit
Yes	No	_____	Account for planned roadway improvements at future build year and 20-year horizon
			MITIGATION
Yes	No	_____	Identify need for right/left turn lanes, storage capacity and length
Yes	No	_____	Identify possible corrections of any LOS deficiencies
Yes	No	_____	Identify any access deficiencies (including transit/pedestrian/bicycle connections)
Yes	No	_____	Identify any TDM measures
			FIGURES
Yes	No	_____	Vicinity Map
Yes	No	_____	Site Plan
Yes	No	_____	Existing peak hour turn movement volumes (counts conducted within previous 12 months)
Yes	No	_____	Trip Distribution (%) including Added Project Peak Hour Traffic Volumes (see sample)
Yes	No	_____	Approved Projects Peak Hour Traffic Volumes (see sample)
Yes	No	_____	Programmed transportation improvements and transportation mitigation outlined in study
			TABLES
Yes	No	_____	Intersection Performance Existing Conditions
Yes	No	_____	Project Trip Generation
Yes	No	_____	Intersection Level of Service
			OTHER
Yes	No		Technical appendix - sufficient material to convey complete understanding of traffic issues (e.g. HCM or similar analyses, trip generation calculations, signal warrant analyses, turn lane warrant analyses, queuing calculations, signal timing sheets, traffic counts, etc.)

Completed By: _____ [SEAL]

Date: _____