

Appendix 7 Traffic Impact Analysis: TIS – Scope R2



Oregon

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Department of Transportation

Region 2 Tech Center

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Date: May 8, 2006

File:

Subject: Traffic Impact Analysis Scope of Work
Project Name
Adjacent Highway Name – Route Number (Highway Number)
Milepost/Milepost Range
City Name
County Name

Attn:

The purpose of this letter is to define the scope of work for a Traffic Impact Analysis (TIA), which evaluates the impact for the proposed

The Oregon Department of Transportation (ODOT) and _____, along with the Developer previously met and discussed the need and general scope of a traffic impact analysis for this project. The affected jurisdictions agreed that ODOT would be the lead agency regarding the traffic study coordination. Therefore, any questions or comments will be coordinated through this office.

Scope of Work:

I. General:

Executive Summary:

Provide a description of the development, site location and study area (including a site map). Briefly describe the purpose of the analysis, principal findings, recommendations and conclusions.

Analysis Study Area:

Provide a text description (including tax-lot descriptions) of the proposed development; and a graphic showing the intersections and accesses, identified by highway milepost, to be evaluated as part of this analysis.

II. Traffic Data:

Traffic Counts

Full federal manual classification counts shall be made at all study area intersections. For all major intersections, the count must be at least 14-hours long, with 15-minute breakdowns during the A.M. and P.M. peak hours. For all minor intersections and approaches, the count must be at least 3-hours long, made during the afternoon peak, with 15-minute breakdowns.

Raw traffic volumes will not be accepted for use in traffic analysis. All traffic volumes shall be seasonally adjusted to represent 30th Highest Hour Volumes (30HV) for Current Year, Year of Opening, and Future Year “*background traffic*” conditions. For guidance, please refer to the *Developing Design Hour Volumes* document.

<http://www.oregon.gov/ODOT/TD/TP/Analysis.shtml>

Site Trip Generation, Distribution and Assignment:

Site trip generation shall utilize the most current edition of the Institute of Transportation Engineers (ITE) Trip Generation Manual to estimate daily and peak hour trip volumes originating from and destined to the proposed development.

This analysis should use available transportation models in conjunction with the City of “*Name*”, as well as current Transportation System and Comprehensive Plans to estimate traffic distribution patterns. Approved computer models, such as Traffix, or manual calculations may also be used for determining trip assignments for site-generated traffic volumes on roadways within the study area.

All assumptions, adjustments and variables shall be approved by Region Traffic in advance. Trip distribution and assignment will be shown on a vicinity map, as percentages and trips at significant intersections within the vicinity of the development. This information shall be documented and discussed in the TIA, or in the appendix.

Analysis Procedures:

Capacity Analysis:

Capacity analysis of signalized intersections, unsignalized intersections, and roadway segments shall follow the established methodologies of the current Highway Capacity Manual (HCM2000). For signalized intersections, the overall intersection V/C shall be reported. For unsignalized intersections, the highest approach V/C shall be reported, along with an indication of its corresponding movement.

Refer to **Table 3.3.7** in the Development Review Guidelines; it lists ODOT's default parameters for use in signalized intersection analysis. If the parameters used in the analysis are outside those listed in **Table 3.3.7**, documentation shall be supplied as justification. If multiple intersections are analyzed, the traffic volumes shall be balanced between intersection nodes. All intersection capacity analyses shall include heavy vehicles percentages by approach, as determined from manual counts.

<http://www.oregon.gov/ODOT/TD/TP/DRG.shtml>

Project level mobility results (V/C) from the TIA will be compared against the Highway Design Manual mobility requirements (Table 10-1, 20 Year Design Mobility Standards). Planning level mobility results (V/C) from the TIA will be compared against Highway Mobility Standards (Policy 1F) and the Maximum V/C Ratios provided in Table 6 of the 1999 Oregon Highway Plan (OHP), August 2005 Amendments.

http://www.oregon.gov/ODOT/TD/TP/orhwyplan.shtml#1999_Oregon_Highway_Plan

Application of Computer software shall closely follow ODOT-approved analysis methodologies. HCS2000 and Synchro/SimTraffic are examples of accepted analysis software. For further guidance, contact TPAU. All electronic files used in this analysis shall be provided via CD-ROM or ODOT's FTP site. For details, contact the Region Traffic office.

<ftp://ftp.odot.state.or.us/>

Queue Length Analysis:

Intersection operation analysis shall include the effects of queuing and blocking. Average queue lengths and 95th Percentile queue lengths shall be reported for all study area intersections. The 95th Percentile queuing shall be used for design purposes, and will be reported to the next nearest 25 foot increment. Any methodology used to determine queue length shall be approved in advance by either TPAU or the Region, and documented in the TIA or appendix.

III. Analysis Requirements:

Intersection Sight Distance:

Adequate intersection sight distance shall be verified for all proposed intersections and highway approaches as required in ODOT's 2005 Highway Design Manual. For guidance, please contact the Region Access Management Engineer.

http://egov.oregon.gov/ODOT/HWY/ENGSERVICES/hwy_manuals.shtml

Right & Left Turn Lane Criteria:

Proposed right or left turn lanes at unsignalized intersections and private approach roads shall meet installation criteria contained in the current Highway Design Manual (HDM). For turn lane evaluation procedures, refer to:

<http://www.oregon.gov/ODOT/TD/TP/Analysis.shtml>

Traffic Signal Installations & Modifications:

Analysis and recommendations related to new and/or modified traffic signals shall follow ODOT's Traffic Signal Policy and Guidelines, and all subsequent revisions. These documents can be found on the web at:

<http://www.oregon.gov/ODOT/HWY/TRAFFIC/publications.shtml>

New signal proposals for Day of Opening shall show, but are not limited to, the following:

- A clear indication of need for a traffic signal; only after other enhancements to nearby signals are shown to be insufficient to mitigate the new highway related impacts resulting from the proposed development.
- An assessment of the ability of existing, planned, and proposed public roads to accommodate development traffic at another location.
- A detailed description how the proposed development will affect existing and proposed study area intersections.
- Documentation of traffic volumes and signal warrant satisfaction; if a new signal is determined to be the correct solution.

Clearly show how one or more of the eight warrants identified in the Millennium Edition of the Manual on Uniform Traffic Control Devices (MUTCD), Chapter 4C, Sections 1 through 9 are met, consistent with the requirements of OAR 734-020-0490. Traffic signal spacing requirements shall conform to the 1999 Oregon Highway Plan. Progression analysis shall meet the requirements of OAR 743-020-480.

If applicable; complete time-space diagrams for each of the analysis scenarios, including the existing coordinated system shall be provided. They will demonstrate the proposed signal system is capable of maintaining adequate progression band widths for through traffic on the State Highway on the most critical roadway segments within the study area.

Any recommendations for traffic signals to be installed as part of future mitigation should meet preliminary signal warrants (MUTCD Warrant #1, Case A & B). All future proposed signals shall still need to meet the need and warrants as described. For guidance, please contact TPAU or the Region, or refer to the Preliminary Signal Warrant Guidelines.

<http://www.oregon.gov/ODOT/TD/TP/Analysis.shtml>

NOTE: It is ultimately up to State Traffic Engineer to approve all signal installations, modifications and deviations. Just because an intersection may meet the MUTCD Warrants does not insure it will be approved by the State Traffic Engineer.

Access Management:

Demonstrate how the proposed access, or accesses meet the minimum spacing criteria of OAR 734-051; or how it coincides with the current access management plan/strategy.

IV. Analysis Output:

Existing Conditions:

Identify current year site conditions at the proposed development location. This includes, but is not limited to the following:

- A description of the site location, zoning, existing use(s), and proposed use(s) of subject property.
- A description of surrounding land uses.
- A graphic identifying existing lane configurations and traffic control devices at the study area intersections.
- A graphic showing existing 30HV traffic; reported as AM (7-9 a.m.) and PM (4-6 p.m.) Peak Hour Volumes (PHV), and also as average daily traffic (ADT). Also include in this graphic a list of heavy vehicle percentages by approach.
- An analysis of existing intersection operations, reported in terms of both Volume to Capacity (V/C) and Level of Service (LOS).
- An analysis of at least 3-years worth of crash data; including information on all SPIS sites within or adjacent to the study area.

Traffic Volumes & Operations – Year of Opening; with & without Proposed Development:

An analysis shall be made of all study area intersections in the Year of Opening, for both “*background traffic*” and “*total traffic*” conditions. “*Total traffic*” conditions are considered “*background traffic*” volumes plus site generated trips. This analysis should provide the following:

- A graphic showing Year of Opening “*background traffic*” and “*total traffic*” volumes.
- A graphic or table showing V/C and LOS analysis results for both “*background traffic*” and “*total traffic*” volumes.
- A graphic or table itemizing storage length requirements for all approaches, rounded to the next nearest 25 foot increment.
- If applicable, a discussion of progression performance along the analysis corridor.

Traffic Volumes & Operations – Future Year; with & without Proposed Development:

An analysis shall be made of all study area intersections for a XX-year horizon, for both “*background traffic*” and “*total traffic*” conditions. This analysis should provide the following:

- A graphic showing Year of Opening “*background traffic*” and “*total traffic*” volumes.
- A graphic or table showing V/C and LOS analysis results for both “*background traffic*” and “*total traffic*” volumes.
- A graphic or table itemizing storage length requirements for all approaches, rounded to the next nearest 25 foot increment.
- If applicable, a discussion of progression performance along the analysis corridor.

Planned transportation system improvements anticipated within the XX-year horizon shall be incorporated into the Future Year analysis. Do not incorporate improvements that are proposed as mitigation for the development. For guidance, please refer to the Transportation Planning Rule (TPR): OAR 660-012-0060.

<http://egov.oregon.gov/ODOT/TD/TP/TPR.shtml>

Analysis Variable Inputs:

A summary of traffic analysis variable inputs shall be provided in an appendix. In Synchro, the ***Int: Lanes, Volumes, Timings*** report is the output source for this information. TIA’s submitted without an input summary will not be accepted by the Department.

Conclusions and Recommendations:

Summarize existing and future conditions and discuss the proposed development's impacts. Identify any operational or safety deficiencies and recommend mitigation along with the effectiveness of the mitigation. Summarize how the proposed development complies with all operational and safety standards in the applicable approval criteria.

Note: Signal timing adjustments will not be considered as mitigation.

Sincerely,

Name
Title

cc:

Traffic Impact Analysis: TIS-TIA Guidance R1

ODOT Guidelines for Requiring and Requesting Traffic Impact Studies for Development Review

OAR 734 Division 51 Access Management Rule

Oregon Administrative Rule Chapter 734, Division 51, Access Management Rule gives ODOT the authority to regulate access to State highway facilities. OAR 734-051-070 establishes when ODOT may require a TIS and when ODOT shall require a TIS for applicants proposing access to a State highway.

- ODOT **may require** a TIS for proposed developments generating vehicle trips that equal or exceed 600 daily trips or 100 hourly trips; and
- **Shall require** a TIS for proposed developments or land use actions where the on-site review indicates that operational or safety problems exist or are anticipated.

OAR 660-012-0060 Transportation Planning Rule

For comprehensive plan and zone change amendments local governments must make findings that a proposed amendment complies with the Transportation Planning Rule OAR 660-012-0060. There must be substantial evidence in the record to either make the finding of “no significant effect” on the transportation system, or if there is significant effect “assurance that allowed land uses are consistent with the identified function, capacity, and level of service of the transportation facility”. In order to determine whether or not there will be a significant impact on the State transportation system, **ODOT may request** a TIS. The **local jurisdiction may require** the applicant to prepare a TIS to produce substantial evidence in the record.

TPR 660-012-0060 Plan and Land Use Regulation Amendments

(1) Amendments to functional plans, acknowledged comprehensive plans, and land use regulations which significantly affect a transportation facility shall assure that allowed land uses are consistent with the identified function, capacity and performance standards (v/c ratio) of the facility. This shall be accomplished by either:

- a. **Limiting allowed land uses to be consistent with the planned function, capacity, and performance standards of the transportation facility;**
- b. Amending the TSP to provide transportation facilities adequate to support the proposed land uses consistent with the requirements of this division;
- c. Altering land use designations, densities, or design requirements to reduce demand for automobile travel and meet travel needs through other modes, or
- d. Amending the TSP to modify the planned function, capacity and performance standards, as needed, to accept greater motor vehicle congestion to promote mixed use, pedestrian friendly development where multimodal travel choices are provided.

(2) A plan or land use regulation amendment significantly affects a transportation facility if it:

- a. Changes the function classification of an existing or planned transportation facility;
- b. Changes standards implementing a functional classification system;
- c. Allows types or levels of land uses which would result in levels of travel or access which are inconsistent with the functional classification of a transportation facility;
- d. Would reduce the performance standards of the facility below the minimum acceptable level identified in the TSP.

Interchange Management Areas

According to the Oregon Highway Plan 1999, freeways and interchanges are the highest classification of State highway facilities. When a proposed development is within a quarter mile of the terminal of an interchange ramp, ODOT **may request** the local jurisdiction require a TIS.

“Conditional Use” Land Use Applications

Typically, the local zoning code requires that applicant’s demonstrate adequacy of public facilities at year of buildout for “conditional use” approval. A TIS may be necessary for the local government to make findings that there are adequate transportation facilities based on substantial evidence. Local governments typically defer to ODOT for determining whether or not State transportation facilities are adequate to serve the “conditional use”. Therefore, ODOT **may request** the local government require a TIS so that the impacts on State highway facilities can be evaluated.

Operational or Safety Problems

ODOT **may request** the local government require a TIS when our preliminary review indicates that traffic generation from the proposed development may be impacting a State highway intersection where operational or safety problems exist or are anticipated.

State highway is the proposed development’s primary access to the roadway network

ODOT **may request** the local government require a TIS when large amounts of the site generated traffic must use an intersection with the State highway to access the roadway network even when direct access to the highway is not proposed.

ODOT Region 1 TIS Requirements

1. When an applicant has been required to prepare a Transportation Impact Study (TIS) and a State highway facility may be impacted, the applicant is advised to contact the ODOT Transportation Analyst as early in the process as possible to scope the TIS.
2. Unlike most local jurisdictions that use the Level of Service (LOS) letter grades to measure highway performance, the Oregon Highway Plan (OHP) 1999 adopted the volume-to-capacity ratio (v/c) as the mobility standard for State highways. The v/c ratio is defined as the peak hour traffic volume (vehicles/hour) on a highway section divided by the maximum capacity of the highway section. An intersection with a v/c of 1.0 is operating at capacity. A v/c of less than 1.0 indicates that there is additional capacity at the intersection and a v/c exceeding 1.0 indicates that the intersection is operating over capacity. Mobility standards for State highways can be found in Tables 6 and 7 (as amended) of the OHP.
3. If the analysis area includes a signalized State highway intersection, the applicant must use ODOT’s existing or planned signal timing for the intersection. For this information, applicants are advised to contact the ODOT Signal Manager.

4. Transportation Planning Rule OAR 660-012-0060 Compliance Analysis for Zone Changes or Comprehensive Plan Amendments must address the following:
- a. A TIS (prepared by a transportation engineer registered in Oregon) shall compare the land use with the highest trip generation rate allowed outright under the proposed zoning with the land use with the highest trip generation rate allowed outright under the existing zoning (this is commonly referred to as a “worst case” traffic analysis)*. The analysis should utilize the current edition of Institute of Transportation Engineers (ITE) *Trip Generation* manual, unless otherwise directed. If the applicant chooses to perform the analysis using a trip generation rate determined by any means other than from ITE *Trip Generation*, the proposed trip generation rate must meet ODOT concurrence.
 - b. The analysis should apply the highway mobility standard (volume-to-capacity ratio) identified in the OHP over a planning horizon of the adopted local transportation system plan or 15 years from the proposed date of amendment adoption, whichever is greater (OHP Action 1F2).
 - c. In situations where the highway facility is operating above the OHP mobility standard and transportation improvements are not planned within the planning horizon to bring performance to standard, the performance standard is to avoid further degradation. If the proposed zone change or comprehensive plan amendment increases the volume-to-capacity ratio further, it will significantly affect the facility (OHP Action 1F6).

*It is particularly important that the applicant’s transportation engineer provide ODOT the opportunity to review and concur with the mix of land uses and square footage they propose to use for the “reasonable worst case” traffic analysis for both existing and proposed zoning prior to commencing the traffic analysis.