CHAPTER 6 - APPENDIX F
TRAFFIC IMPACT ANALYSIS

TRAFFIC IMPACT ANALYSIS

Introduction

1. A traffic impact analysis is a specialized study of the impacts a certain type and size of development will have on the surrounding transportation system. The traffic impact analysis is an integral part of the development impact review process. It is especially concerned with the generation, distribution, and assignment of traffic to and from the "new development." The purpose of the analysis is to determine what impact the development traffic will have on the existing and proposed street network and what impact the existing and projected traffic on the street system will have on the "new development." A "new development" is a site action that triggers SEPA requirements which can include cumulative impacts.

2. The BCD Department in consultation with the Public Works Department will determine if there is a need for a traffic impact analysis. In general the need for this analysis will be based upon the size of the development proposed, existing street and intersection conditions, traffic volumes, accident history, community concerns, and other pertinent factors relating to traffic impacts attributable to "new developments."

3. <u>When Required</u>. If a site action requires an Environmental Checklist to be prepared, a Traffic Impact Analysis may be required if any of the following conditions are met. This does not preclude the SEPA Responsible Official's authority to require additional analysis if in his judgment such analysis is necessary or to waive this analysis.
   a. The "new development" generates more than 20 vehicles in the peak direction of the peak hour on the adjacent streets and intersections. This would include the summation of all turning movements that affect the peak direction of traffic.
   b. The "new development" generates more than 25% of site-generated peak hour traffic through a signalized intersection or the "critical" movement at an unsignalized intersection.
   c. The "new development" is within an existing or proposed transportation benefit area. This may include Latecomer Agreements, Transportation Benefit Districts (TBD), Local Improvement Districts (LID), or local/state transportation improvement areas programmed for development reimbursements.
   d. The "new development" may potentially affect the implementation of the street system outlined in the Transportation Element of the Comprehensive Plan, the Transportation Improvement Program, or any other documented transportation project.
   e. The "new development" proposes a rezone of the subject property that could significantly change transportation patterns.
   f. The original analysis of the site is over two years old.

4. <u>Qualifications for Preparation of Documents</u>. Traffic Impact Analysis shall be conducted under the direction of a responsible individual or firm acceptable to the BCD Director and

Public Works Director. The analysis shall be prepared by an engineer licensed to practice in the State of Washington with special training and experience in traffic engineering.

5. Scope of Work. The level of detail and the scope of work of a Traffic Impact Analysis may vary with the size, complexity, and location of the "new development." The analysis shall be a thorough review of the immediate and long-range effects of the "new development" on the transportation system.
    a. A New Development Description
        i. Provide a reduced copy of the site plan showing the type of development, street system, right-of-way limits, access points, and other features of significance in the "new development." Also include pertinent off-site information such as intersections, driveways, land-use descriptions and other significant features with respect to the development.
        ii. Provide a "vicinity map" of the project area showing the transportation system to be impacted by the development.
        iii. Discuss specific development characteristics such as type of development proposed (single-family, multi-family, retail, industrial), internal street network, proposed access locations, parking requirements, zoning, and other pertinent factors.
        iv. Discuss project completion and occupancy schedule.
    b. Existing Conditions
        i. Discuss street characteristics including functional class, number of traveled lanes, lane width, shoulder treatment, bicycle paths, and intersection traffic control.
        ii. Identify safety and access problems including discussions on accident history, sigh distance restrictions, traffic control, and pedestrian conflicts.
        iii. Obtain all available traffic data from the city and other jurisdictions as applicable. If data is not available, then data shall be collected by the firm to supplement the discussions and analysis.
        iv. Conduct manual peak hour turning movement counts at study intersection, if traffic volume data is more than three (3) years old, unless otherwise directed by the city.
        v. A figure shall be prepared showing existing average daily traffic and peak hour traffic volumes on the adjacent streets and intersections in the study area. Complete turning movement volumes shall be illustrated.
    c. Development Traffic
        i. Elements of the analysis shall be conducted initially to identify the limits of the study area. The study area shall include all pertinent intersections and streets impacted by the development traffic.
        ii. Individual or firm preparing the analysis shall submit a figure illustrating the proposed "trip distribution" for the new development to the City Engineer. Once the figure is approved, a formal "scoping" of the study area and the study contents can be conducted to clearly identify the elements of the study.
        iii. Methodology and procedures used in preparing the trip generation and trip distribution elements of the analysis are as follows:

(1) Trip Generation - Site-generated traffic of the "new developments" shall be estimated using the latest edition of the ITE TRIP GENERATION MANUAL. Variations of trip rates will require the approval of the City Engineer. Average trip rates shall be used for all land-use categories where applicable. Trip rate equations will be allowed for those land uses without average rates.

(2) Site traffic shall be generated for daily and A.M. and P.M. peak hour periods. Adjustments made for "passer-by" and "mixed-use" traffic volumes shall follow the methodology outlined in the latest edition of the ITE TRIP GENERATION MANUAL. A "passer-by" traffic volume discount for commercial centers shall not exceed 25% unless approved otherwise by the City Engineer. For multi-use and/or "phased" projects, trip generation tables shall be prepared showing proposed land-use, trip rates, and vehicle trips for daily and peak hour periods and appropriate traffic volume discounts, if applicable.

(3) Trip Distribution - The trip distribution for a "new development" shall be approved by the City Engineer and prior to the formal scoping of the analysis. The methodology shall be clearly defined and discussed in detail in the analysis. The analysis shall identify other transportation modes that may be applicable, such as transit, bicycle, and pedestrian use. New developments are encouraged to implement Transportation Demand Management practices such as "Flex Time" for employees and ride sharing programs including car pools, van pools, shuttle buses etc.

iv. Future Traffic

(1) Future Traffic Conditions not including Site Traffic. Future traffic volumes shall be estimated using information from transportation models or applying an annual growth rate to the base-line traffic volumes. The future traffic volumes shall be representative of the time of full build out based upon current zoning. The City Engineer will determine an appropriate growth rate, if that option is utilized. In addition, proposed "on-line" projects shall be compared to the increase in traffic by applying an annual growth rate. If modeling information is not available, the greatest traffic increase from either the "on-line" developments or the application of an annual growth rate shall be used to forecast the future traffic volumes.

(2) Future Traffic Conditions including Site Traffic. The site-generated traffic shall be assigned to the street network in the study area based on the approved trip distribution model. The site traffic shall be combined with the forecasted traffic volumes to show the total traffic conditions estimated at development completion. A future will be required showing daily and peak period turning movement volumes for each traffic study intersection.

v. Traffic Operations

(1) The level of service (LOS) and capacity analysis shall be conducted for

each pertinent intersection in the study area as determined by the BCD and Public Works Directors. The methodology and procedures for conducting the capacity analysis shall follow the guidelines specified in the Highway Capacity Manual-Special Report 209, 1985 Edition. The individual or firm preparing the analysis shall calculate the intersection LOD for each of the following conditions:

(a) Existing peak hour traffic volumes

(b) Existing peak hour traffic volumes including site-generated traffic

6. Future traffic volumes not including site traffic
7. Future traffic volumes including site traffic
8. Level of Service results for each traffic volume scenario.
    a. The Level of Service Table shall include the LOS results for A.M. and P.M. peak periods, if applicable. The table shall show LOS conditions with corresponding vehicle delays for signalized intersections and LOS conditions for the critical movements at unsignalized intersections. For signalized intersections, the LOS conditions and average vehicle delay shall be provided for each approach and the intersection as a whole.
    b. The capacity analysis for existing signalized intersections shall include existing phasing, timing, splits and cycle lengths in the analysis as observed and measured during the peak hour traffic periods. All traffic signal system operational data may be obtained from the Public Works Department.
    c. If the "new development" is scheduled to be completed in phases, the analysis shall conduct a LOS analysis for each separate phase of the development. The incremental increases in site traffic from each phase shall be included in the LOS analysis for each proceeding year of development completion.
    d. The Public Works Department may require that the analysis be conducted on computer software compatible with City software.
9. Mitigation
    a. The analysis shall include a proposed mitigation plan. The mitigation may be either the construction of necessary transportation improvements or contributions to any established transportation impact fund.

ITE TRIP GENERATION RATES BY MAJOR LAND USE CATEGORIES

Land Use Type*	Average Weekday Trip Generation Rates
Residential	**Trips per Indicated Measure: Dwelling Unit**
Single-family detached	10.06
Condominium/townhouse**	5.86
Multi-Family apartment	6.60
Mobile home park	4.81
Retirement community	3.30
Recreational home (owner)	3.16
Office Building	**Trips per Indicated Measure: 1,000 gross sq.ft. of building area**
General office, 10,000 gross sq.ft.	24.39
General office, 50,000 gross sq.ft.	16.31
Medical office building	34.17
Office park	11.40
Research center	6.09
Retail	**Trips per Indicated Measure: 1,000 gross sq.ft. of leasable area**
Specialty retail	40.67
Discount store	71.16
Shopping center	
10,000 sq.ft. gross leasable area	166.35
50,000 sq.ft. gross leasable area	94.71

Land Use Type*	Average Weekday Trip Generation Rates	
Industrial	**Trips per Indicated Measure:**	
	Employee	**1,000 gross sq.ft. of building area**
Light industrial	3.02	6.97
Industrial park	3.41	6.97
Manufacturing	2.09	3.85
Warehousing	3.89	4.88
Mini-Warehouse	56.28	2.61
Lodging	**Trips per Indicated Measure:**	
	Employee	**Room**
Hotel	14.34	8.70
Motel	12.81	10.19
Institutional	**Trips per Indicated Measure:**	
	Employee	**Student**
Elementary school	13.10	1.03
High school	16.79	1.39
Junior/community college	10.06	1.55
Library	49.50	45.50
		(per 1,000 gross sq.ft.)

Notes:
*For definitions, see below.
**High-rise condominium (>2 stories) = 4.18

RESIDENTIAL STREET HIERARCHY: DEFINITION

Residential Street Type	*Function*	*Guideline Maximum ADT*
1)Local Access Street	Lowest order of residential streets. Provides frontage for access to lots, and carries traffic having destination or origin on the street itself. Designed to carry the least amount of traffic at the lowest speed. All, or the maximum number of housing units, shall front on this class of street. Residential access streets should be designed so that no section conveys an ADT greater than 250. Each half of a loop street may be classified as a single residential access street, but the total traffic volume generated on the loop street should not exceed 500 ADT, nor should it exceed 250 ADT at any point of traffic concentration.	250 (each loop) 500 (total)
2) Minor (neighborhood) Collector	Middle order of residential street. Provides frontage for access to lots and carries traffic of adjoining residential access streets. Designed to carry somewhat higher traffic volumes with traffic limited to motorists having origin or destination within the immediate neighborhood. Is not intended to interconnect adjoining neighborhoods or subdivisions and should not carry regional through traffic. Subcollectors shall be designed so that no section conveys an ADT greater than 500. Each half of a loop subcollector may be classified as a single subcollector street, but the total traffic volume conveyed on the loop street should not exceed 1,000 ADT, nor should exceed 500 ADT at any point of traffic concentration.	500 (each loop) 1,000 (total)
3) Major Collector	Highest order of residential streets. Conducts and distributes traffic between lower-order residential streets and higher-order streets. Function is to promote safe, free traffic flow; therefore, parking and direct access to homes from this level of street should be discouraged.	3,000 (total)
4) Minor Arterial	A higher order, interregional road in the street hierarchy. Conveys traffic between centers.	3,000 +