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TRAFFIC IMPACT ANALYSIS GUIDELINES**A. PURPOSE**

It is the policy of the City of Chelan that review of proposed development with respect to potential significant traffic impacts should be utilized to promote development consistent with transportation infrastructure needs and provide a predictable and consistent development review process. A Traffic Impact Analysis (TIA) is a specialized study of the impacts that development will have on the surrounding transportation system. The TIA is an integral part of the development impact review process. It is specifically concerned with the generation, distribution, and assignment of traffic from the "new development".

The purpose of a TIA is:

- to determine the impacts of new development traffic on the existing and proposed street network;
- to determine the layout and design of the proposed roadway system;
- to determine if the new development can meet the concurrency aspects of the Growth Management Act; and
- to determine the appropriate traffic mitigation for the project.

New development is defined as a "site action that triggers SEPA requirements". This may include previous development on a site with consideration to cumulative impacts for the purpose of making a SEPA threshold decision. In the case of redevelopment, the City will evaluate whether the incremental increase in volume due to site redevelopment meets the criteria included in Section B requiring a TIA be conducted. Redevelopment shall include expanded or increased development, or use or occupancy of a building or site that has been dormant for a period of more than five years. "New development" shall not include individual one or two-family residential lots within plats.

These guidelines have been prepared to establish the requirements for a Traffic Impact Analysis. The City of Chelan Public Works and Planning Departments are responsible under SEPA and City codes for determining the need for a Traffic Impact Analysis. The City of Chelan Public Works Department will approve the scope of work, review the Traffic Impact Analysis, and make recommendations to the Planning Department as part of the SEPA and land use process.

All reports shall be submitted in a professional format that can be interpreted by all departments. Exhibits shall include a border with a title block identifying the project and a description with legible text clearly identifying all items. Exhibits shall be constructed with AutoCAD or equivalent software.

B. WHEN REQUIRED

To adequately assess traffic impacts on the transportation system and traffic level of service, the City may require a Traffic Impact Analysis (TIA). A full or partial TIA may be required if any of the following conditions are met:

1. The "new development" will generate more than 20 PM Peak Hour Trips.
2. The project requires a SEPA review.
3. 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.
4. The "new development" will generate more than 50 Peak Hour trips at a time other than PM Peak Hour.
5. The Public Works Department is unable to determine the traffic generation characteristics of the development.
6. The Developer feels further traffic analysis may clarify questions about the identified traffic facilities charge for the project.
7. The "new development" access to the roadway network may create an impact as determined by the Public Works Department.
8. The "new development" impacts an area identified by the Public Works Department that cannot meet the concurrency requirements of the Growth Management Act.
9. 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.
10. Modifications are required to the original TIA that is more than two years old, or where the increase in traffic volume as measured by ADT, peak hour, or peak hour of the critical movement is more than 10%.
11. A rezone of the subject property is being proposed.
12. Current traffic problems exist in the local area as identified by the City or a previous traffic study, such as a high-accident location, poor roadway alignment, or capacity deficiency.
13. The current or projected level of service of the roadway system in the vicinity of the development is perceived to be significantly affected, or is expected to exceed City adopted level of service standards.

C. QUALIFICATIONS FOR PREPARING TIA DOCUMENTS

The Traffic Scoping or the Transportation Impact Analysis shall be prepared and stamped by an engineer licensed to practice in the State of Washington with special training and experience in traffic engineering.

D. SCOPING REPORT

If a Traffic Impact Analysis is required, the applicant or engineer shall submit a Traffic Scoping Information Worksheet providing the information listed below. The Traffic Scoping Information Worksheet is provided at the end of this section.

- Applicant name, address and phone
- Name of project
- Parcel Number(s)
- Project size in square feet and acres
- Proposed uses, including square footage of each use
- Existing use, including square footage of each use

Once the City has reviewed the Traffic Scoping Information Worksheet, the City will identify the land use code(s) from the current ITE manual to be used in the scoping report and provide information on trip distribution for the project.

The engineer shall then submit 4 copies of a Scoping Report to the Public Works Department to assist the City of Chelan in the development of the scope of work for the TIA. The Scoping Report shall include all items listed below:

- Project Size in Square Feet and Acres
- Project Location
- Proposed Use
- Phasing Plan
- Daily Trips
- Year of Occupancy (Horizon year of project)
- Number of Lots or Units
- Trip Generation
- PM Peak Hour Trips
- Land Use Code from the latest edition of the Trip Generation Manual by the Institute of Transportation Engineers (ITE) as provided by the City of Chelan Public Works Department.
- A reduced copy of the "site plan" showing the type of development, street system, right-of-way limits, proposed access points and other features of significance of the Development. The site plan shall also include pertinent off-site information such as dimensioning to all existing intersections and driveways with the existing channelization, land use descriptions, street right-of-way limits with respect to the existing roadway and other features of significance. Figure B illustrates an example site plan.
- A graphical distribution map showing site generated PM peak hour traffic. Generally, traffic should be distributed to one PM peak hour trip within the study area. This map shall clearly identify all traffic movements and the percentage of site traffic. Figure D is an example of an acceptable trip

- distribution map.
- Name, address and phone number of project developer and traffic consultant.
 - Intersections impacted by 10 or more project trips entering primary intersections (typically arterials and collectors).
 - If streets or intersections affected are within Chelan County or Washington State Department of Transportation jurisdiction, identify issues that may impact those jurisdictions.

The Scoping Report will be used to develop the scope of work for the Traffic Impact Analysis.

**CITY OF CHELAN
TRAFFIC SCOPING INFORMATION WORKSHEET**

**Please submit the information requested below to the City of Chelan Public Works Department with a copy of the site plan.
Do not submit trip generation or distribution at this time.**

Applicant: _____ Phone: _____

Mailing Address: _____

Parcel Number(s) _____

Parcel Size: _____ square feet _____ acres

Existing Use: _____

Proposed Use: _____

Land Use	# of units or sq ft	For Agency Use Only			
		Land Use Code	Basic Rate PM Peak Trips/Unit	New Trips %	New Trip Rate

For Agency Use Only

Project Trips to be Distributed as Follows:

E. TRAFFIC IMPACT ANALYSIS

The level of detail and scope of work of a TIA may vary with the size, complexity and location of the "new development". A TIA shall be a thorough review of the immediate and long-range effects of the "new development" on the transportation system.

1. Prospectus

- A. Provide a vicinity map of the project area showing the transportation system to be impacted by the development. Figure A is an example of an acceptable vicinity map.
- B. Provide a reduced copy of the site plan showing the type of development, street system, right-of-way limits, proposed access points, and other features of significance in the "new development". The site plan shall also include pertinent off-site information such as dimensioning to all existing intersections and driveways with the existing channelization, land use descriptions, and street right-of-way limits with respect to the existing roadway and other features of significance. Figure B is an example of a site plan.
- C. Discuss specific development characteristics such as type of development proposed (single-family, multi-family, retail, industrial, etc.), internal street network, proposed access locations, parking requirements, zoning, and other pertinent factors attributable to the "new development".
- D. Discuss project completion, phasing plan and occupancy schedule for the "new development". Identify horizon years for traffic analysis purposes.

2. Existing Conditions

- A. Discuss street characteristics including functional classification, number of travel lanes, lane width, shoulder treatment, bicycle path corridors, pedestrian facilities, transit routes, transit accessibility and traffic control at study intersections. A Figure may be used to illustrate existing transportation facilities.
- B. Identify approved nearby land development planned or under construction (pipeline projects) and associated traffic.
- C. Identify safety and access issues including sight distance restrictions, traffic control, crash potential and pedestrian conflicts.
- D. Obtain all available traffic data from City of Chelan and surrounding jurisdictions if applicable. If data is unavailable, the individual or firm preparing the TIA shall collect the necessary data to support the discussions and analysis in the TIA.
- E. For traffic analysis, the PM peak hour conditions shall be used. The PM peak hour is defined as the 60-minute period between 4:00 p.m. and 6:00 p.m. with the greatest sum of traffic volumes on a roadway segment or

passing through the area of the project. Reversed flow at intersections from morning to afternoon, and other unusual conditions, shall require analysis for both AM and PM peak hour conditions as required by the City. The baseline traffic condition will be reflective of July/August summer traffic flows. Traffic counts performed outside of this timeline will be adjusted back to the summer peak flow.

- F. Conduct manual peak hour turning movement counts at study intersections if traffic volume data is more than 2 years old unless otherwise directed by the Public Works Department. A copy of the data shall be attached to the TIA when submitted to the Public Works Department for review.
- G. A Figure shall be prepared showing existing average daily traffic (ADT) and peak hour traffic volumes on the adjacent streets and intersections in the study area. This Figure shall represent the baseline traffic volumes for analysis purposes. Complete turning movement volumes shall be illustrated as shown on Figure C.

3. Development Traffic

This element of the TIA shall be conducted initially to identify the limits of the study area. The threshold requirement of development traffic exceeding 10 PM hour trips shall apply. Through the scoping process, the City will provide a list of intersections to be analyzed in the TIA.

4. Trip Generation

The methodology and procedures used in preparing the trip generation and trip distribution elements of the TIA are as follows:

Site-generated traffic of the "new development" shall be estimated using the the peak hour trip rate identified in the latest edition of the Trip Generation Manual as published by the Institute of Transportation Engineers (ITE). The City will provide a list of ITE land uses to be utilized. Variations of trip rates will require the approval of the Public Works Department. 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. Table formats for trip generation shall not be interpolated. Generally, the consultant shall use individual rates for mixed-use developments.

Variations from the trip rates will be considered in the scoping process. The consultant shall submit a letter explaining the reason for the variation and all supporting documentation. Trip generation studies shall follow standard ITE guidelines and be statistically valid for approval by the Public Works Department.

Site traffic shall be generated for daily and P.M. peak hour periods. For certain types of developments, the Public Works Department may also require site traffic estimates for the AM peak period. A "pass-by" traffic volume discount for applicable commercial development shall be calculated based on data identified in the Trip Generation Handbook, most current edition, published by the Institute of Transportation Engineers (ITE). If a comparable use is not identified in the ITE Trip

Generation Handbook, an independent study of a minimum three comparable uses shall be used. The comparable sites must be approved by the City.

Land uses not identified in the ITE Trip Generation Handbook will typically have a "pass-by" rate between 0% and 25% maximum and shall be consistent with similar land uses approved by the City. If a minimum three comparable uses cannot be identified, the developer may use rates previously approved by the City for similar uses if available. "Pass-by" discounts will not be permitted for residential or office developments.

For multi-use and/or phased projects, a trip generation table 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.

5. Trip Distribution

The directional distribution of traffic to and from the project shall be based on historical traffic counts and land use projections provided by the City, if available. The Public Works Department shall approve the trip distribution for a "new development" during the formal scoping process.

A graphical distribution map prepared using AutoCAD or equivalent graphical software shall be submitted showing site-generated PM peak hour traffic. Generally, traffic shall be distributed to one PM peak trip within the study area. This map shall clearly identify all traffic movements and the percentage of site traffic. Figure D is an example of a trip distribution map.

6. Future Traffic Conditions

Future traffic volumes shall be estimated by including the following elements:

- A minimum 2.5% annual growth rate shall be applied to the baseline traffic volumes. The growth rate used in the TIA will be approved during the scoping process.
- All traffic generated by anticipated nearby land development (pipeline projects with an approved traffic scope) shall be included when forecasting future traffic volumes. A pipeline project is defined as a development that is either under construction, approved for construction, or in the permitting process.

The future traffic volumes shall be representative of the year the project development shall be completed (horizon year).

The site-generated traffic shall be assigned to the street network in the study area based on the approved trip distribution. The site traffic shall be combined with the forecasted traffic volumes to show the total traffic conditions estimated at development completion. A Figure will be required showing daily and peak period turning movement volumes for each traffic study intersection. The following Figures shall be prepared:

- Site-generated Traffic Volumes (Figure D)
- Pipeline Development Traffic (Figure E)
- Projected Volumes Without Project (Figure F)
- Projected Volumes With Project (Figure G)

7. Traffic Operations

Level of Service (LOS) is a qualitative term describing operating conditions a driver will experience while traveling on a particular street or highway during a specific time interval. It ranges from A (very little delay) to F (long delays and congestion).

Level of service calculations for intersections determine the amount of "control delay" (in seconds) that drivers will experience while proceeding through an intersection. Control delay includes all deceleration delay, stopped delay, and acceleration delay caused by the traffic control device. The level of service is directly related to the amount of delay experienced.

The Level of Service (LOS) and capacity analysis shall be conducted for each pertinent intersection in the study area as determined by the Public Works Department. The methodology and procedures for conducting the capacity analysis shall follow the guidelines specified in the most recent edition of the Highway Capacity Manual-Special Report 209. The individual or firm preparing the TIA shall calculate the intersection LOS and present the data in a table format for each of the following conditions:

- A. Existing traffic volumes
- B. Future traffic volumes not including site traffic
- C. Future traffic volumes including site traffic

The Level of Service table shall include LOS results for key peak periods as applicable, generally the PM peak hour. The table shall show LOS conditions with corresponding vehicle delays for signalized intersections. The LOS conditions and average vehicle delay shall be provided for each approach and the intersection as a whole. For all unsignalized intersections, the table shall show the weighted intersection average in delay and level of service, including the LOS for the minor street movements.

If the "new development" is scheduled to be completed in phases, the TIA shall conduct a LOS analysis for each separate development phase. The incremental increases in site traffic from each phase shall be included in the LOS analysis for each succeeding year of development completion. A "Figure" will be required for each horizon year of phased development.

The TIA must include a discussion of every intersection and its potential impact to the intersection operation. The TIA shall also identify programmed improvements that are planned by others (i.e., development projects, City CFP and/or WSDOT improvements).

The capacity analysis shall be conducted using computer software compatible with the Public Works Department's software package. The individual or firm preparing the TIA shall use Synchro for capacity analysis of signalized intersections and unsignalized intersections. SIDRA software shall be used for analyzing modern roundabout intersections. Other computer software packages used for capacity analysis applications will not be accepted. A copy of the capacity analyses worksheets and digital CD shall be submitted concurrently with the TIA document.

If the "new development" impacts a traffic signal coordination system currently in operation, the Public Works Department may require the TIA to include operational analysis of the system. Timing plans and proposed modifications to the coordination system may be required.

8. Access Management

Requests for site access shall be addressed in the Traffic Impact Analysis. Recommendations shall include site access and transportation improvements needed to maintain traffic flow to, from, within, and past the site at an acceptable and safe level of service.

Areas to address include:

- Separate conflict areas. Reduce the number of access points or increase their spacing so conflict areas or maneuver areas do not overlap.
- Limit the type of conflict areas by preventing certain maneuvers.
- Remove turning vehicles or queues from through lanes.
- Safety of a proposed access (sight distance both horizontally and vertically), including pedestrian features.
- Reduce the speed differential in through lanes between through vehicles and turning vehicles.
- Consider the impact of access points on adjacent or nearby properties on both sides of the roadway.

Improvements include such things as: relocation, restriction, or elimination of access point, roadway widening, turning lanes, traffic signals, modern roundabouts, and pedestrian facilities.

9. Sight Distance

As noted in Section 8 above, sight distance restrictions shall be addressed in the TIA. Sight distance is the length of roadway visible to the driver. Specified areas along intersection approach legs and across their included corners should be clear of obstructions that might block a driver's view of potentially conflicting vehicles. These specified areas are known as clear sight triangles. The dimensions of the legs of the sight triangles depend on the design speeds of the intersecting roadways and the type of traffic control used at the intersection. Intersection sight distance calculations shall be based on the most recent edition of the AASHTO Manual.

10. Alternate Modes of Transportation

The TIA shall identify other transportation modes that may be applicable, such as

transit use, bicycle and pedestrian facilities. New developments are encouraged to implement Transportation Demand Management practices.

11. Safe Walking Conditions

The TIA must consider pedestrian connections and provision of safe walking routes for school children. It shall consider sidewalks and other planning features to assure safe walking conditions for students who walk to and from school.

12. Road Adequacy

The TIA shall include detailed discussion and analysis of the adequacy of roads serving the site and within the project. Pavement condition, width of travel lanes, turning lanes, pedestrian and bicycle facilities, sidewalks, shoulders, etc. are to be evaluated, not the capacity of the roadway to accommodate project traffic. Recommendations for needed upgrades to local roadways shall be included in the TIA.

13. On-Site Planning and Parking Principles

The number of vehicle access points should be minimized by sharing driveways and linking parking lots between adjacent uses. Commercial developments shall provide coordinated internal circulation and connected parking facilities. Well-defined walkways must be designed into all parking lots, with interconnections between walkways to create safe walking conditions.

14. Safety Analysis

Accident records (minimum of three years of collision history) are to be analyzed to determine whether patterns of accidents are forming at the pertinent intersections within the study area and what alternative treatments should be considered to correct the problem. Examples of recurring accidents include:

- Right-angle collisions at an intersection
- Rear-end collisions at an intersection
- High frequency of vehicles leaving the roadway

15. Traffic Calming

Internal traffic calming shall be incorporated into all developments to control cut-through traffic and reduce speed within the development. The Traffic Impact Analysis shall identify and propose specific traffic calming measures and locations to be incorporated in the development. Traffic calming shall be aesthetically pleasing. Public transportation shall also be evaluated. The traffic-calming plan shall include an overall drawing of the development and identify specific locations and features to be included in the development. The proponent's traffic engineer shall work with the Public Works Department to develop a traffic-calming plan for the development.

16. Concurrency Management

The concurrency management evaluation shall be prepared by the Public Works Department and shall follow the procedure outlined below. Each "new

development" subject to this procedure shall be analyzed in the order the completed project application is received by the Department. Concurrency traffic evaluations will be completed sequentially in the order of project application. The most recent concurrency management evaluation will be the beginning point for each succeeding concurrency management analysis.

In performing the concurrency evaluation, the Department shall determine the impact of the traffic generated by the proposed "new development" on the City's road system. The evaluation shall be based on data generated by the City, by professional associations, by the applicant, and if needed, by independent analysis. The City shall examine the data to verify that:

- A. The density assumptions for the "new development" are consistent with the underlying zoning.
- B. Existing and projected trip generation is consistent with the latest edition of the Trip Generation Manual as published by the Institute of Transportation Engineers (ITE).
- C. Level of service calculations for all affected intersections are accurate and based upon horizon year conditions with and without the "new development". The City shall determine if the capacity on the City's road facilities, plus the capacity that is or shall be generated by all existing and approved development can be provided while meeting the LOS standards adopted by the City.
- D. For concurrency purposes, the LOS standards and policies identified in the Transportation Element of the City's Comprehensive Plan will apply.

17. Mitigation

The TIA shall clearly identify potential impacts to streets, intersections, pedestrian facilities, etc. that will require traffic mitigation. Based on the results of the TIA, the City will identify the appropriate mitigation for the "new development". The following guidelines shall be used to determine appropriate mitigating measures of traffic impacts generated by new developments.

- A. To maintain the adopted Level of Service Standard, the "new development" shall provide a financial guarantee or construct improvements to maintain the level of service at or above the adopted standard. This improvement must be consistent with the City's Transportation Comprehensive Plan goals and policies.
- B. On transportation facilities where the need to construct improvements by the horizon year of the "new development", the cost for the mitigation will be entirely borne by the "new development". However, in the event the Public Works Department identifies more than one development under simultaneous review, accumulative impacts and distribution of mitigation costs may be considered. A latecomers agreement could be formulated by

the "new development" for reimbursement of mitigation costs.

- C. On transportation facilities programmed for new improvements as part of a City project, the adverse traffic impacts of the "new development" will be considered mitigated by payment of a transportation facility charge in effect for the current Six-Year Transportation Improvement Program.
- D. On transportation facilities where the existing Level of Service is less than the adopted concurrency standard, and where no improvements are programmed to improve capacity and traffic operations, the "new development" shall mitigate the intersection back to pre-development conditions to ensure the operational performance of the intersection is not exacerbated.
- E. Unsignalized intersections that currently operate at less than the adopted Level of Service area shall be analyzed for traffic signal and intersection improvements. If two or more traffic signal warrants are satisfied, signal and intersection improvements may be required by the City.
- F. On signalized intersections in the city where the projected Level of Service condition is acceptable but where one or more of the approaches falls below the adopted concurrency standard, mitigating measures may be required to improve the capacity and traffic operations at the intersection. The City reserves the right to review all adverse traffic impacts at these intersections and to determine appropriate mitigating measures.

18. TIA Submittal

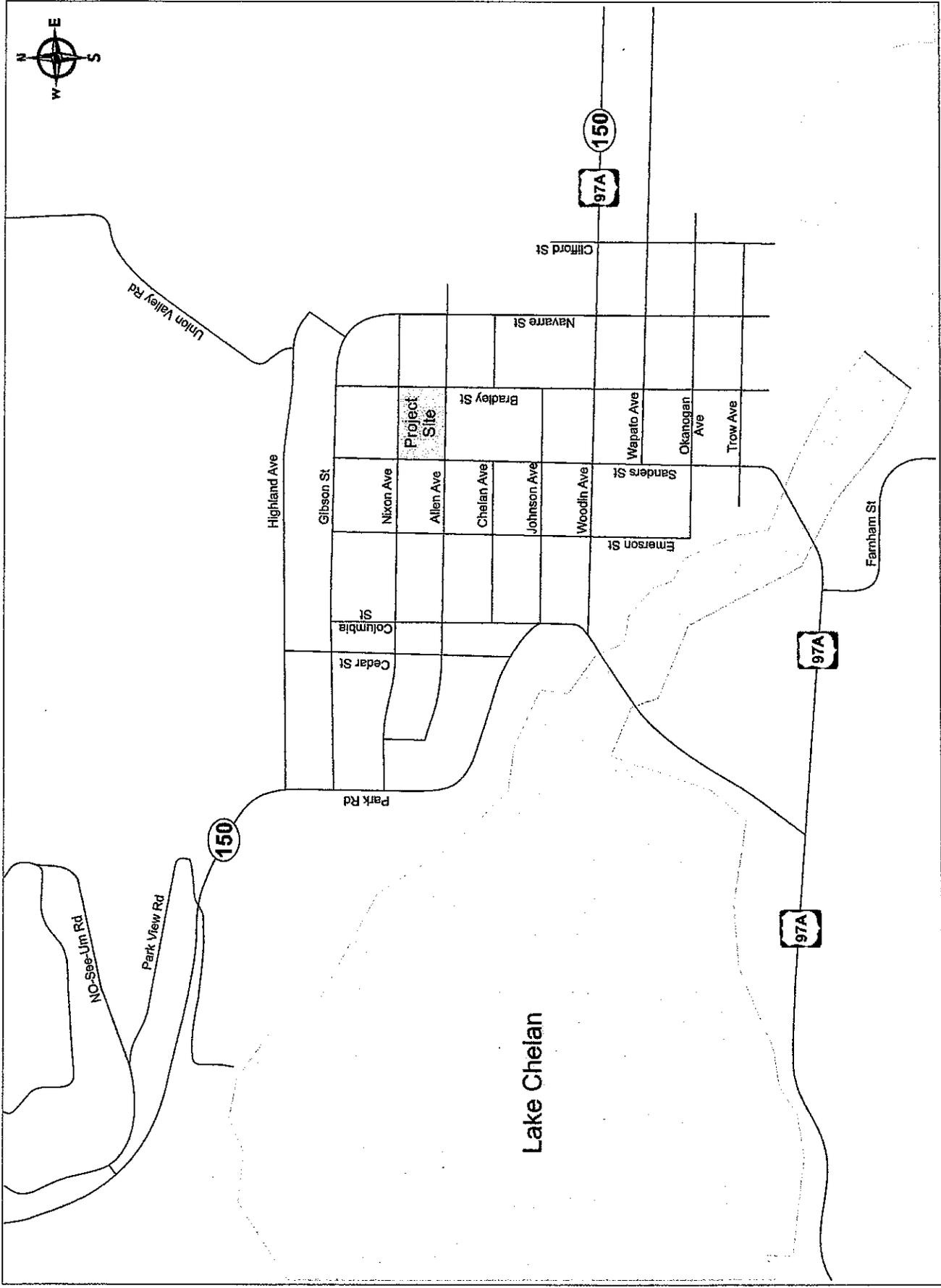
The Traffic Impact Analysis shall be submitted to the Public Works Department in the following format:

- One hard copy of TIA and all documentation
- Copy of TIA, including appendices, in PDF format
- Electronic copy of Synchro output and data files
- Electronic copy of SIDRA output and data files for roundabout analysis.

19. Communication Between City and Applicant

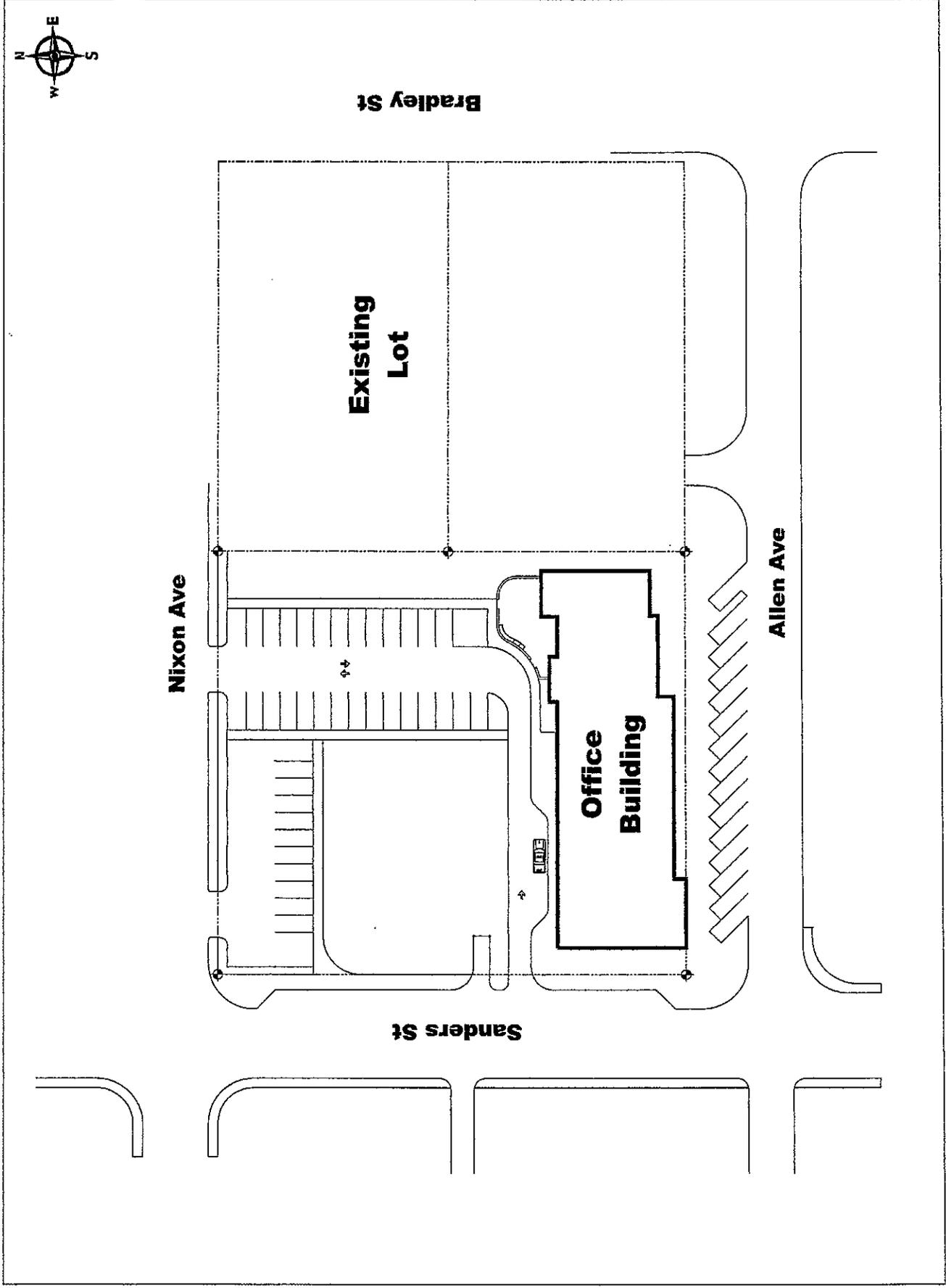
Scoping reports and TIAs are to be submitted to the City of Chelan Public Works Department.

- Scoping meetings shall be arranged through the Public Works Department and all questions with regard to scoping shall be directed to the Public Works Department.
- All specific questions or requests for information must be directed to the Public Works Department in writing (e-mail is acceptable.)



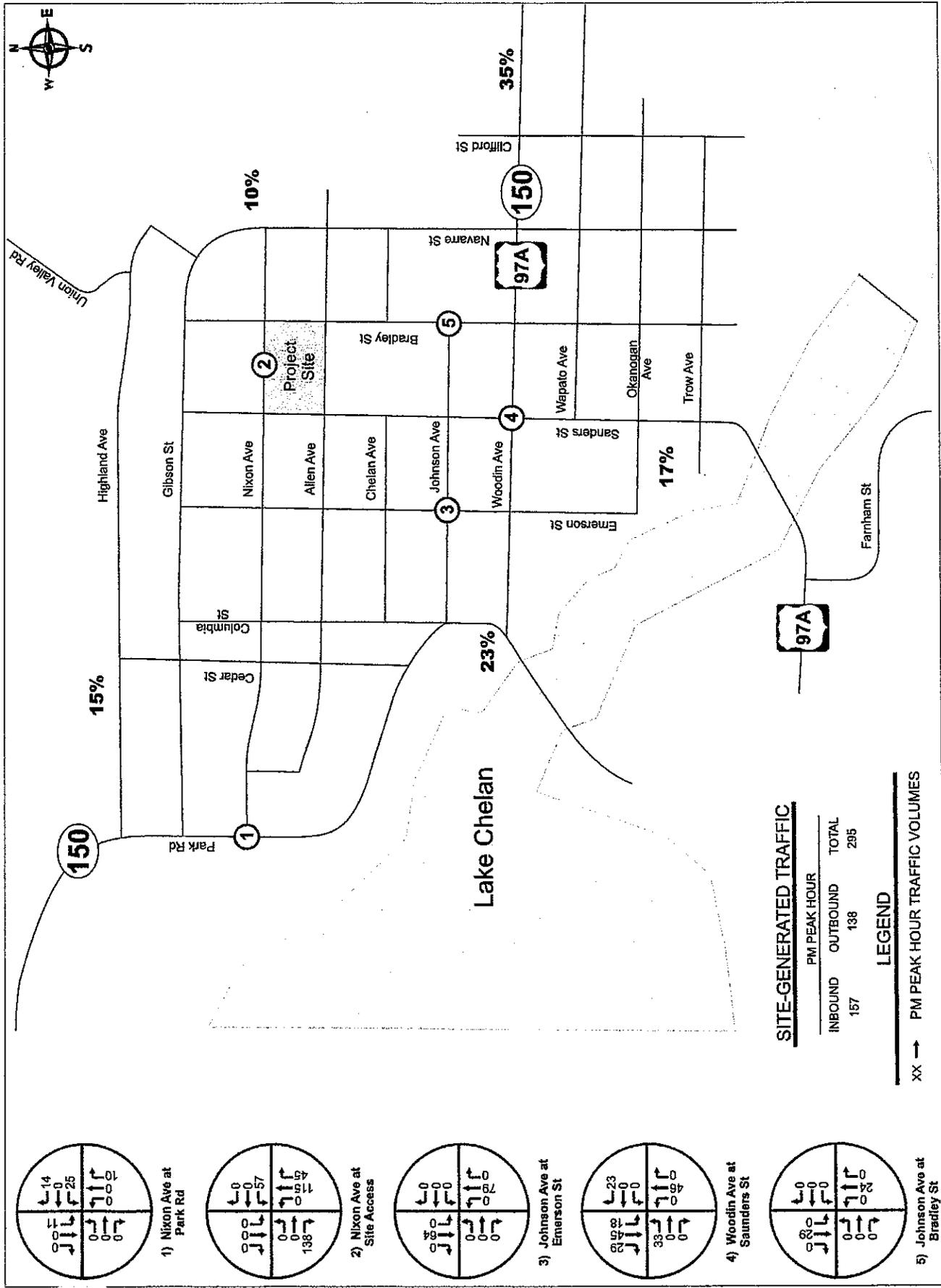
Vicinity Map
 Sample
 Traffic Impact Analysis

Figure A



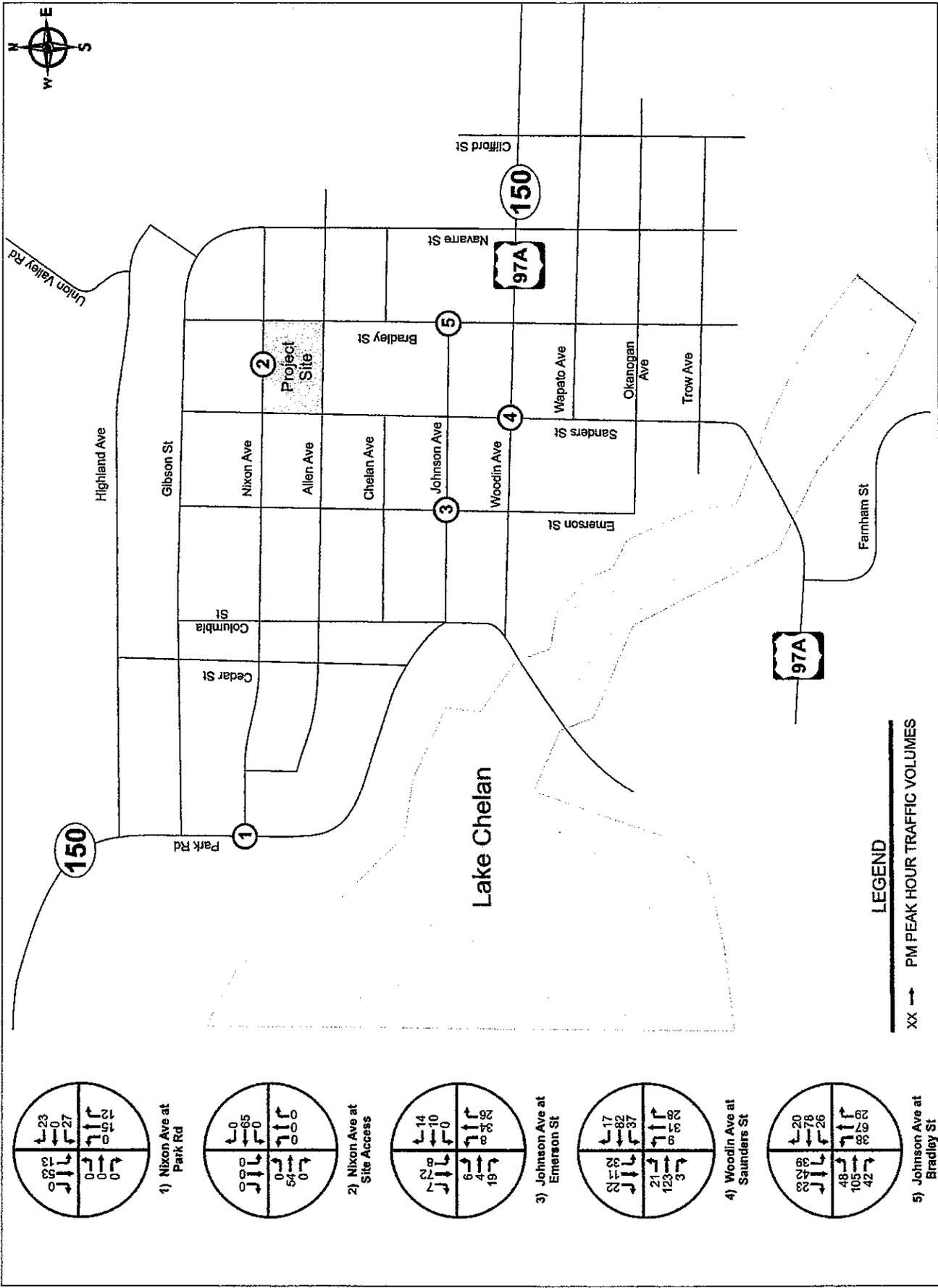
**Preliminary Site Plan
Sample
Traffic Impact Analysis**

Figure B

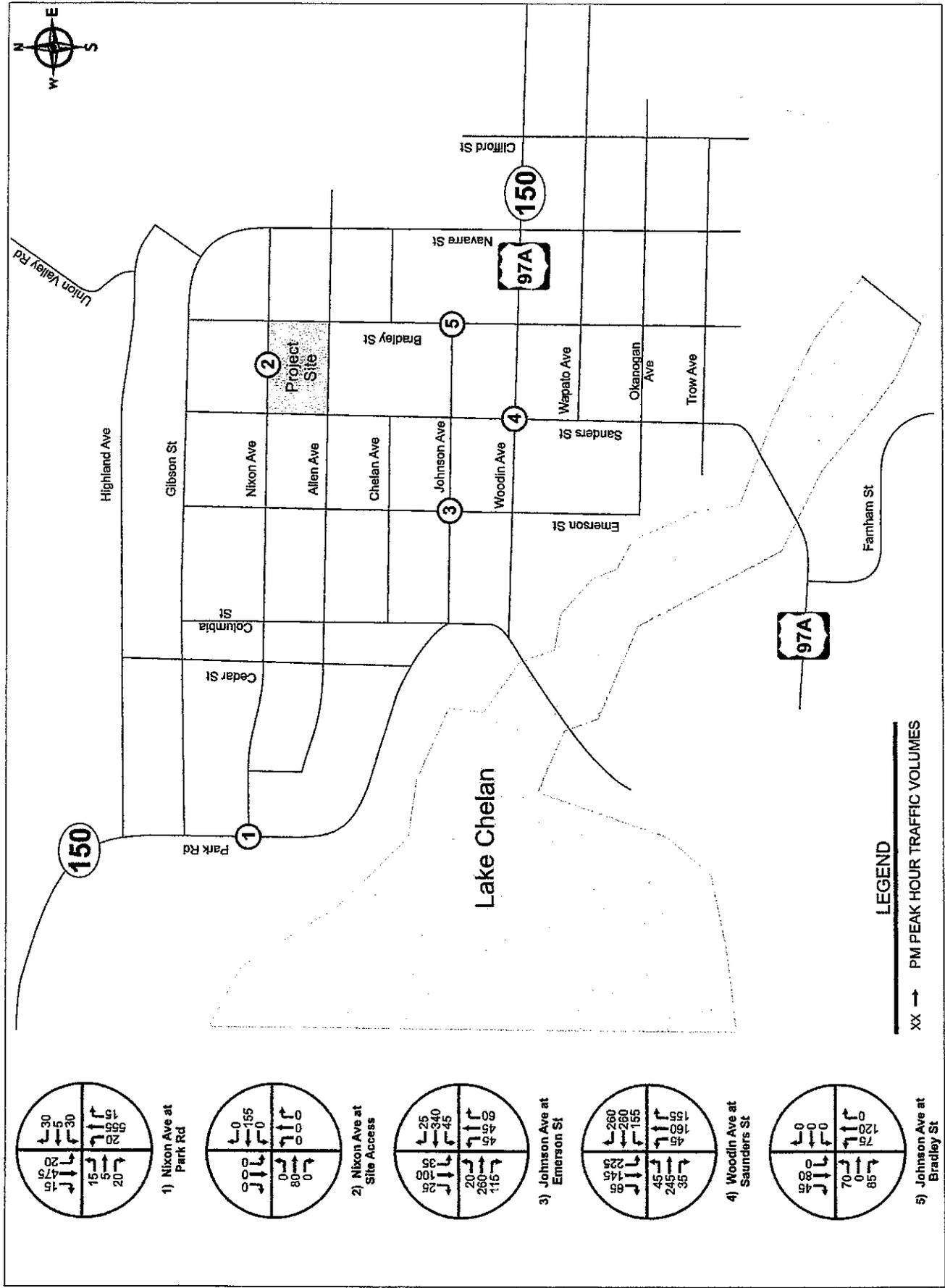


Site-Generated PM Peak Hour Traffic Volumes
Sample
Traffic Impact Analysis

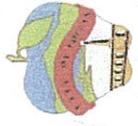
Figure C



Pipeline Development PM Peak Hour Traffic Volumes
Sample Traffic Impact Analysis

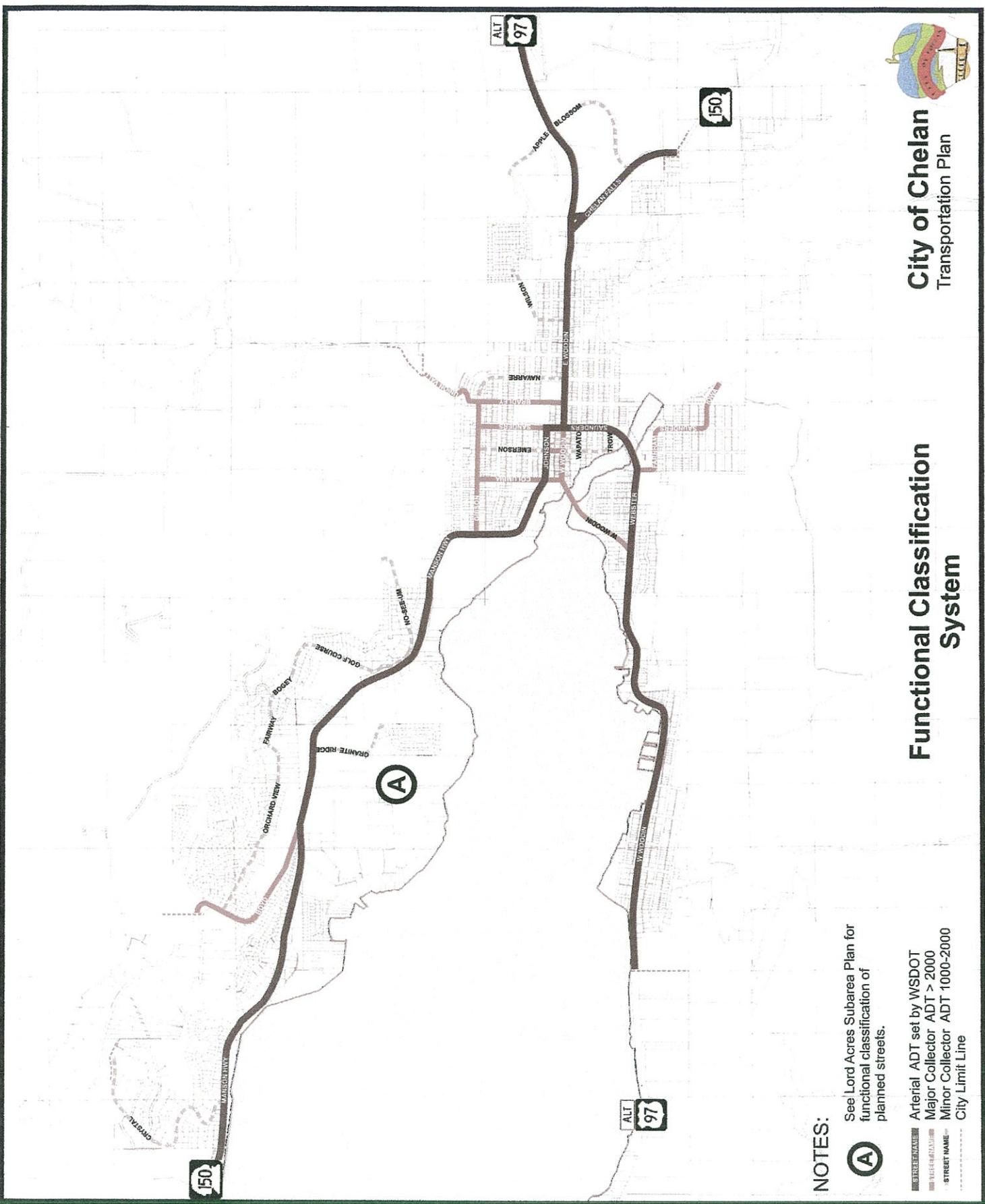


**Projected 2010 PM Peak Hour Traffic Volumes Without Project
Sample
Traffic Impact Analysis**



City of Chelan Transportation Plan

Functional Classification System



NOTES:

See Lord Acres Subarea Plan for functional classification of planned streets.



- Arterial ADT set by WSDOT
- Major Collector ADT > 2000
- Minor Collector ADT 1000-2000
- City Limit Line

- STREET NAME
- STREET NAME
- STREET NAME