Requirements for Transportation Impact Studies

Introduction

New land developments and expansions of existing developments can have a significant impact on the transportation system, particularly if planning and consideration of system improvements are not adequately addressed. In order to ensure that a highway system can satisfactorily accommodate a proposed development, a Transportation Impact Study (TIS) may be required to analyze relevant impact issues. A TIS is a comprehensive study that analyzes all surface transportation modes that would be affected by a development, including pedestrians, bicycles, and public transportation services. The impact analysis area must be larger than just the immediate site and must take in surrounding development and any known developments which may occur in the near future. The TIS concludes whether any transportation improvements are necessary to accommodate the new traffic volumes generated by the development. These improvements could include right turn lanes, left turn lanes, additional through lanes, acceleration lanes, bicycle lanes, bus stops, sidewalks, islands, medians, access control, traffic signals, removal and/or consolidation of existing approaches, etc.

General Requirements

The TIS documents the extent of the impact of the proposed development on the highway system, including trips added, resulting level of service during AM and PM peaks, and the need for auxiliary lanes or other special capacity or safety features. Required changes in traffic control, land use, access, pedestrian or bicycle usage must also be documented.

Additionally any changes effecting safety or traffic operations on the state highway system including, but not limited to striping, channelization, medians, islands, signalization and/or changes in access, shall be documented by the developer to show that all adjacent and/or affected property owners and businesses have been contacted and the impacts to their property has been discussed. A list of the names and addresses of all adjacent and/or affected property owners and businesses who were contacted shall be included with the TIS.

A TIS should be required when a new or an expanded existing development has **direct** access to the state highway system and may be required when **indirectly** accessing the state highway system. Development that adds a minimal number of new trips as described below will be required to provide the trip generation information in both an electronic and written format for review by department personnel.

- A “full” TIS shall be required for developments that will generate 100 or more new trips per hour (total two-way traffic) during the highway’s peak hour, or when the total added volume will equal or exceed 1000 vehicles per day (or a lesser volume when specified by the Department).

- A “minor” TIS is required for developments that will generate between 25 and 99 new peak hour trips or will add from 250 to 999 vehicles per day.

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While the number of trips described above is designed to define the type of TIS required, the ADT and level of service of the existing roadway in combination with the number of trips may dictate the need for a "full" TIS. In rural areas, the TIS requirement may be waived. The District Engineer shall make the final decision regarding the requirement of a TIS. If the proposed development is in an air quality non-attainment zone, then some analysis for air quality shall also be required.

A TIS shall bear the stamp and signature of a professional engineer registered in the State of Idaho. The engineer that performs the study must regularly consult and coordinate with the LPA and/or the ITD District Traffic Engineer. The developer is responsible for hiring the engineer to perform the TIS.

The study will be submitted by the developer to the Local Public Agency (LPA) or, when the State Highway System is affected, to the Idaho Transportation Department (ITD). The study must be approved by the LPA or ITD before any alterations on the highway system will be allowed.

The rest of this document is devoted mainly to the requirements of a "full" TIS. A "minor" TIS may cover a smaller area, contain less detail, etc. **The developer should contact the LPA and/or the ITD District Traffic Engineer to verify the extent of the Traffic Impact Study and the documentation that will be required.**

Impact Analysis Area

In general, any links (streets) that will experience a directional increase of 250 ADT or 25 vehicles in the peak hour should be included in the study. The study area should extend beyond the immediate area up to a one half mile (1/2 mi.) outside the development boundaries and may include any link or street that experiences a 5% directional increase in traffic and the effects of other development which may coincide with the immediate development. At a minimum, the area should include the entire frontage of the property(ies) involved plus a distance equal to the access spacing distance for the facility in each direction from the property, or to the nearest intersecting collector or arterial street, whichever is greater. Additionally, the TIS requires the inclusion of:

- All state highways and major city or county streets that serve the proposed development or land use change,
- Interchange ramps in the area, and
- Any other local streets that directly serve the proposed area or feed major arterials and collectors that serve the proposed development.

The ITD or LPA is responsible for defining the impact analysis area.

Existing Background Information

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The gathering of existing information is the next step in developing the TIS. One of the most important pieces of information is traffic volumes. The developer's engineer must obtain average daily traffic (ADT) counts and average annual daily traffic (AADT) counts for key locations in the vicinity of the proposed project. These counts should show turning volumes as well as through traffic.

The (ADT) traffic volumes can be obtained by setting out traffic recorders or by using existing traffic counts that are not more than one year old. The ADT and AADT traffic volumes for many areas can be obtained from the ITD Traffic Survey and Analysis section. Requests for volumes from ITD should be coordinated through the ITD District Traffic Engineer.

The traffic volumes are then adjusted to obtain the peak hour of travel at each key location by using peak hour factors or hourly counts. The peak hour volume can also be adjusted to reflect seasonal variations using reliable documented historic data. The peak hour and seasonal variations will assist in deriving the peak hour of the peak month. The peak hour usually used in the analysis is the PM peak hour.

The ITD District Traffic Engineer can answer most traffic volume questions or make sure that the assumptions are reasonable and acceptable.

The engineer studying the proposed area is also required to review and address other background information in the TIS. Some key information to review is as follows:

- Type of highway facility that will be impacted to define the access category, spacing requirements, and Level of Service (LOS) limitations for the facility.
- Existing traffic signal system information to determine signal timing and coordination. The existing operational information of the state highway and street system is very important.
- Committed and planned roadway improvements in the area. Local comprehensive land use and transportation plans including zoning areas, approved development projects and anticipated development projects in the area must be in the TIS.
- Local government's applicable codes and policies.

An expanded list of background data that may be considered in the TIS is in Appendix A.

Non-Site Traffic Forecast

When the present peak hour traffic has been identified and developed, then the future year background traffic volumes can be developed. This non-site traffic consists of the future through traffic and the generated traffic of all other future developments up to one half mile

(1/2 mi.) from the immediate area. There are many different methods for calculating the background traffic.

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One method is to use existing models of the area. The three Idaho Metropolitan Planning Organizations (Ada Planning Association, Bannock Planning Organization, Bonneville Metropolitan Planning Organization) have models for their jurisdictional areas and can assist the consultant in using the model. Lewiston and Nampa also have city-wide models.

Another method available is to use growth rates or trends. Growth projections for future years must be based on documented historical data for the study area. The method chosen by the consultant to develop the background traffic must be approved by the LPA or the ITD District Traffic Engineer.

In addition to the existing traffic growth projections, potential traffic increases due to other developments (planned and anticipated) in the area may also be required. In addition, some assumptions for development of other vacant lands in the vicinity of the project should be identified and included in the total background non-site traffic. This additional traffic is important in areas where developmental growth may not be represented sufficiently in the traditional growth trends. The LPA and the ITD District Traffic Engineer should be consulted to determine requirements for assessing other developments in the TIS.

Site Traffic Generation

The LPA and ITD will generally only accept the methods outlined in the most current edition of the Institute of Transportation Engineers (ITE) Trip Generation manual. However, other trip generation methods may be acceptable, subject to LPA or ITD concurrence prior to their use. Trip generation information will be required to be provided in both an electronic and written format for review by department personnel.

The ITE Trip Generation manual contains rates and equations for typical weekday and weekend daily trip ends, both AM and PM peak hour trips for weekday and weekend trips and the corresponding entering/exiting split. These trip ends may need to be adjusted for seasonal variations such as the Christmas holiday season. Variations or adjustments may also be required to account for local conditions such as public transportation. Pass-by trip reductions may be allowed, but the final assumption of pass-by rates and any other adjustments must be reviewed and accepted by the LPA or the ITD District Traffic Engineer.

All assumptions for adjustments must be documented and discussed in the TIS.

The TIS must contain a table showing the total weekday trips generated, total weekend trips, AM, Noon, and PM peak hour trips at all intersections and accesses which are included in the study area, and entering and exiting volumes for each proposed development use. A separate table with other anticipated and possible developments that could occur due to local plan amendments or other land use changes could also be included.

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Site Generated Traffic Distribution and Assignment

A Trip Distribution diagram must be included in the TIS. The project-generated traffic must be assigned and distributed onto the existing street network to accurately analyze the effects of the proposed development or land use change. Any of the distribution and assignment methods recognized by ITE are acceptable.

Trip assignments can be developed with computer models or by manual calculations. All assignment assumptions must be agreed to by the LPA or the ITD District Traffic Engineer, and must verify the distribution pattern developed above.

Study Horizon Years

The selection of which horizon years to analyze is important. A general rule of thumb is to include the current year, year(s) of completion of a major phase or build-out, and a future date of 20 years beyond build-out. Local comprehensive plan amendments or other land use changes will generally require the future analysis year to be 20 years or more beyond build-out. Both a build and a no-build alternative should be analyzed for each period. The current period requires only a no-build analysis (background traffic). The horizon year must be agreed to by the LPA or the ITD District Traffic Engineer.

Traffic Flow Diagrams

A traffic flow diagram is required for all intersections in the study area and all accesses to the proposed development or land use change. The diagram will show generated trips, background traffic and the combined volumes of both background and generated traffic. A separate diagram is required for each intersection or each access for each analysis year, including both through volumes and turning volumes.

Analysis Topics

Items which require analysis:

1) Level of Service for all intersections and access points for each analysis year;
2) Level of Service for critical links for each analysis year;
3) Left turn warrants;
4) Signal warrants;
5) Weaving and merge analysis;
6) Sight distance;
7) Queue length analysis;
8) Impacts to other transportation modes (bicycle, pedestrian and transit);
9) Signal progression;
10) Acceleration/deceleration lanes;
11) Transportation Demand Management measures;
12) Any mitigation measures suggested by the consultant;

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13) Geometrics;
14) Air quality;
15) Internal circulation and stacking; and
16) Frontage or backage roads; and
17) Approach spacing; and
18) Driveway conflicts; and
19) Turning movement restrictions, i.e (islands, medians, etc.): and
20) Compliance with Idaho Transportation Dept. access policy, I.D.A.P.A Rule 39.03.42. (http://www2.state.id.us/adm/adminrules/rules/idapa39/0342.pdf)

Refer to Appendix A for a more detailed listing.

Analysis Guidelines

One of the goals of the analysis is to identify areas that are now or will be operating inefficiently in the future. Level of Service (LOS) or capacity analysis is usually based on volume to capacity (v/c) ratio. The LPA and ITD will accept most software analysis packages which base LOS results on v/c ratios.
Delay-based LOS software analysis may be included in the TIS, but the LPA and ITD will generally rely on v/c ratios. Under certain circumstances, if the LOS computed by v/c is marginal and the vicinity's traffic characteristics warrant, then delay-based calculations may be considered. If the intersection is to accommodate pedestrian traffic then pedestrians must be incorporated into the LOS calculation.

Left turn lanes, acceleration and deceleration lanes, and signal warrants will be based on LPA or ITD standards. Traffic signal progression analysis should use the latest version of PASSER software or other software specified by the LPA or ITD. The analysis package TRANSYT-7F shall only be used in urban system or link analysis.

Copies of all calculations and analysis results, including all capacity analyses and all warrants analyses for each study year, shall be submitted as an appendix to the TIS. The Department may request electronic media for the analysis, calculations or video demonstrations of Traffic Operations.

Additional Considerations

If the proposal is in an air quality non-attainment zone, then the effects of the development on air quality must be addressed. ITD's Environmental section can answer questions about non-attainment areas and air quality regulations.

When an intersection or link is identified as operating at a LOS equal to or below the minimum level specified in local transportation plans or ITD's Congestion Management System Work Plan, then mitigation measures shall be developed to bring the LOS back to an acceptable level.

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Mitigation measures must be compatible with state corridor plans, local system plans, Metropolitan Planning Organization plans and state design principles. The mitigation measures should be addressed individually to explain and illustrate their efforts to improve the impacts of the development or land use action. An example is how the addition of a traffic signal at an access location will improve the level of service for the access while not hindering traffic progression.

Mitigation Approval

All geometric or roadway improvements, including turn lanes, deceleration lanes, islands, medians, curbs, sidewalks and transit pull outs, must be approved by an LPA official or the ITD District Engineer. LPA and ITD personnel may also be required to review and/or approve certain proposed mitigation measures. For example, signal improvements or installation on the State Highway System requires the approval of the ITD District Engineer per Administrative Policy A-12-06.

The design of the signal will be performed by the applicant's engineering consultant under the terms of an agreement and must be reviewed and approved by the State Traffic Engineer. Right of way acquisitions or dedications that are required for the State Highway System must be approved for acquisition by the ITD Right of Way section.

An Encroachment permit for access to the State Highway System will be required for all changes in access, such as new approaches or changes to an existing approach. Such changes may include changes to location, width or use. An encroachment permit will not be issued without a deed for the parcel involved being provided with the request. The deed must be for the current parcel owner. A developer may act on behalf of the existing property owner if a letter of authorization is provided to the Department at the time of permit application. Requests for changes in access SHALL be addressed for the current parcel owner ONLY, pending sales or future owners do not qualify. Access to a state highway and designation of access control during a Department highway project must be approved through the use of an ITD-606, Access Control form.

Site and Off-Site Improvements

A detailed vicinity map and a proposed site plan for the development are required in the TIS. The site plan should include schematic drawings and discussions of the following:

1) All access locations to the site (include dimensions, drainage and cross section),
2) All impacted intersections in the study area,
3) Any existing or proposed signals and appropriate timing information,
4) Proposed highway or local street improvements (e.g. alignment, added lanes, and cross section),
5) Bicycle, pedestrian, and public transit considerations and plans, and
6) Site circulation patterns and parking.

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All proposed improvements must be checked for conformance with land use and access control requirements.

Recommendations and Conclusions

A recommendations and conclusion section will detail the engineer's recommendations for mitigation measures. A summarized version should be included in the executive summary section of the TIS. Refer to Appendix B for a suggested outline for the TIS.

Review and Conceptual Approval of the TIS

The LPA or ITD District Traffic Engineer must review and approve the contents and conclusions of the TIS. Regular contact and consultation with the LPA and ITD throughout the process is recommended to resolve issues early and save costly engineering and time delays later on. The LPA and ITD shall review and comment on any completed TIS within thirty (30) calendar days.

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APPENDIX A

SUGGESTED BACKGROUND DATA

The following general categories and specific items should be considered for discussion in the TIS:

Traffic Volumes

- Current and (if needed for analysis) historic daily and hourly volume counts
- Recent intersection turning movement counts
- Seasonal variations
- Projected volumes from previous studies or regional plans
- Relationship of count day to both average and design days

Land Use

- Current land use, densities, and occupancy in vicinity of site
- Approved development projects and planned completion dates, densities, and land use types
- Anticipated development on other undeveloped parcels
- Land use master plan
- Zoning in vicinity
- Absorption rates by type of development

Demographics

- Current and future population and employment within the study area by census tract or traffic zone (as needed for use in site traffic distribution)

Transportation System

- Current street system characteristics:
  - Functional classifications
  - Posted speed limits and prevailing operating speeds (if significantly different than posted speeds)
  - Direction of flow
  - Geometrics
    - Lane widths and uses
    - Curves and grades
    - Sight distances
    - Vertical and lateral clearances
  - Parking availability and regulations
  - Illumination
  - Right-of-way
  - Access control
    - Existing approaches serving sites across from or adjacent to the site
  - Type of traffic control
    - Traffic signal locations, phasing, timing and coordination
- Adopted local and regional plans
- Planned thoroughfares in the study area and local streets in the

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	vicinity of the site, including improvements • Public transportation service and use • Pedestrian and bicycle linkages and uses • Obstacles to the implementation of planned projects • Implementation timing and certainty of funding for study area transportation improvements
Other Transportation Data	• Origin-destination or trip distribution data • Accident history (3 years if available) adjacent to site and at nearby major intersections if hazardous condition is identified

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APPENDIX B

SAMPLE TRANSPORTATION IMPACT STUDY OUTLINE

The following outline is a guide for preparing the Transportation Impact Study. Some studies can be easily documented using this outline; however, additional sections may be warranted because of specific issues or results of the study and inapplicable sections may be omitted.

I. Introduction and Summary

A. Purpose of Report and Study Objectives

B. Executive Summary

1. Site location and study area
2. Development description
3. Principal findings
4. Conclusions
5. Recommendations

II. Proposed Development

A. Off-site Development

B. Description of On-site Development

1. Land use and density
2. Location
3. Site plan
4. Zoning
5. Project phasing and timing

III. Area Conditions

A. Study Area

1. Area of influence
2. Area of significant traffic impact

B. Study Area Land Use

1. Existing land uses
2. Existing zoning
3. Anticipated future development

C. Site Accessibility

1. Area roadway system
   a) Existing

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b) Future
2. Traffic volumes and conditions
3. Public transportation service
4. Other as applicable

IV. Projected Traffic

A. Site Traffic (Each Horizon Year)
1. Trip generation
2. Trip distribution
3. Modal split
4. Trip assignment

B. Through Traffic (Each Horizon Year)
1. Method of projection
2. Non-site traffic for anticipated development in study area
   a) Method of projections
   b) Trip generation
   c) Trip distribution
   d) Modal split
   e) Trip assignment
3. Through traffic
4. Estimated volumes

C. Total Traffic (Each Horizon Year)

V. Traffic Analysis

A. Site Access
B. Capacity And Level Of Service
C. Traffic Safety
D. Traffic Signals
E. Site Circulation and Parking

VI. Improvement Analysis

A. Improvements to Accommodate Base Traffic
B. Additional Improvements to Accommodate On-Site and Off-Site Traffic
C. Alternative Improvements
D. Status of Improvements Already Funded, Programmed or Planned
E. Evaluation

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VII. Conclusions

A. Site Accessibility
B. Traffic Impacts
C. Need for Improvements
D. Compliance With Applicable Local Codes

VIII. Recommendations

A. Site Access/Circulation Plan
B. Roadway Improvements
   1. On-site
   2. Off-site
   3. Project phasing, if appropriate
C. Other