

# Utah Department of Transportation Traffic Impact Study Requirements

This memo and preceding information is prepared to assist an access permit applicant fulfilling the requirement of performing a traffic impact study when requesting access to a state highway. Each permit application is unique. The agreed requirements of traffic study and assessment may vary accordingly as agreed to by the Department and the applicant and/or their representative who will perform the traffic study.

**Please refer to the Department document, *Accommodation of Utilities and the Control and Protection of State Highway Rights of Way: Section 7, State Highway Access* for full information concerning the grant of access application requirements. A downloadable copy of the document is available on the Department website at <http://www.udot.utah.gov>.**

The following are taken from the Utah state rule 930-6, Accommodation of Utilities and the Control and protection of State Highway Rights of Way. Statements for this guideline are also added which do not appear in the Rule.

## 7.2.5 Preparing The Access Application

### Pre-Application/Concept Meeting

Prior to submitting a permit application, contact the appropriate Department Region or District office for information about the application process and the type of information required. The applicant is advised to consult with the Region Permit Officer during a pre-application meeting to determine the appropriate access category, permit application level, and traffic impact study requirements, and scope for the project.

### Permit Level

The level of application required is based upon the size and magnitude of the proposed project applying for a permit. Threshold criteria for different levels of projects have been developed to avoid placing an undue burden on applicants with small projects, while ensuring that large projects with significant impacts are thoroughly evaluated.

Four application levels have been developed based on site-generated traffic of AADT and or peak hour volumes. Each level defines specific threshold elements related to required applicant site plan elements, permitting process, permitting schedule, applicant fees, traffic study requirements, and other permit related issues. The information and level of detail required to review an application will vary according to the type and usage of the access connection requested and will be determined based on the thresholds outlines in, Table 7.2-2: Guidelines for Access Permit Levels. The Region Permit Officer, Traffic Engineer and/or designee will determine the Permit Application Level based on preliminary data supplied by the applicant.

A Traffic Impact Study (TIS) is required of all access permit applications. The purpose of the TIS is to identify system and immediate area impacts associated with the proposed connection(s). Identification of impacts and appropriate mitigation measures allows the Department to assess the existing and future system safety, performance, maintenance, and capacity needs.

Determination of the extent of the TIS study area is at the determination of the attending Region Traffic Engineer and /or other Department employees. The study area, depending on the size and

intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary. An acceptable traffic study boundary, based on travel time, may be identified as a ten or twenty minute travel time or even by market area influence.

The TIS shall, at a minimum, incorporate traffic engineering principles and the standards as presented in this Rule. Additional requirements and investigation may be imposed upon the applicant as necessary.

Likely information presented in the TIS may include, but is not limited to, site location and proposed access point(s), phased and/or full development trip generation, connection point design elements, adjacent and relevant development, existing and future traffic volumes, assessment of the system impacts, and mitigation measures as appropriate.

The applicant will be responsible for performance and delivery of an acceptable traffic impact study. The TIS should be performed by an individual or entity demonstrating capability to analyze and report mobility, traffic engineering elements, and design elements as necessary for the application study area and site design. The TIS should be prepared directly, or by direct supervision by a State of Utah Licensed Professional Engineer. The Region Traffic Engineer may waive the licensing requirement for Permit Level I and II, and may also waive the Utah Licensure requirement.

#### 7.2.6 Application Review

For an access permit, submit one complete application with attachments to the Region Permits Officer at the appropriate Department Region Office. The Region Permits Officer is the primary contact for the applicant with the Department throughout the process. Direct inquiries regarding a permit application or review, are directed to the Region Permit Officer.

#### 7.2.11 Traffic Impact Studies

##### Need for Traffic Impact Study

A traffic study is necessary to identify, review, and make recommendations for mitigation of the potential impacts a development may have on the roadway system. Physical characteristics and operational characteristics of the roadway are typically identified. The Region Permits Officer and/or Region Traffic Engineer determine the need for a traffic impact study.

An applicant may be required to submit a traffic study for any proposed access or connection within an area identified by the Department. Area definition may be defined by, but not limited to, an identified safety problem, accident review, congested locations, or as a result of a change in land use and/or access in accordance with an access permit application. The study area may also be defined by a travel time boundary, area of influence, physical boundaries, or political boundaries.

##### Purpose of the Traffic Impact Study

TIS are intended to:

- Document whether or not the access request can meet the standards and requirements of this Rule and other applicable regulations.
- Analyze appropriate location, spacing, and design of the access connection(s) necessary to mitigate the traffic.

- Analyze operational impacts on the highway and permissible under the highway's assigned access category and in accordance with applicable requirements and standards of this Rule.
- Recommend the need for any improvements to the adjacent and nearby roadway system to maintain a satisfactory level of service and safety and to protect the function of the highway system while providing appropriate and necessary access to the proposed development.
- Assure that the internal traffic circulation of the proposed development is designed to provide safe and efficient access to and from the adjacent and nearby roadway system consistent with the purpose of this Rule.
- Analyze and recommend the means for land uses to minimize their external transportation costs to the traveling public through traffic improvements necessitated by that development as well as making the fullest use of alternative travel modes.

#### Traffic Impact Study Requirements

When a Traffic Impact Study is required (See Table 7.2-2), prepare the study according to the Department Traffic Impact Study Requirements. The appropriate Region Traffic Engineer in consultation with the permit applicant will determine the traffic study area limits.

All existing and proposed access points, driveways and streets, shall be identified for each site, including access on the opposite side of the site and within the influence area of the proposed site access. The influence area will be defined by the Region Traffic Engineer and/or designee. Each access will be labeled for proposed accesses as P1, P2, P3... and existing accesses as E1, E2, E3,...

**Accommodation of Utilities and the Control and Protection of State Highway Rights of Way  
Table 7.2-2**

**Guidelines for Access Permit Levels**

<b>Permit Type App. Level</b>	<b>Thresholds</b>	<b>Typical Land Use Intensity Thresholds (ITE Trip Generation)</b>	<b>Traffic Impact Study Required</b>
<b>I</b>	Projected site traffic < 100 ADT <b>and</b> No proposed modifications to traffic signals or elements of the roadway	Single Family < 10 units Apartment < 15 units Lodging < 11 occupied rooms General Office < 9,000 square feet Retail < 2,500 square feet	YES  Conditions Apply
<b>II</b>	Projected site traffic between 100 and 3,000 ADT <b>or</b> Projected peak hour traffic < 500 <b>and</b> Minor modifications to traffic signals or elements of the roadway	Single Family 10 to 315 units Apartment 15 to 450 units Lodging 11 to 330 occupied rooms General Office 9,000 to 270,000 sq. ft. Retail 2,500 to 70,000 sq. ft. Gas Station 1 to 18 fueling positions Fast Food 1,000 to 6, 000 sq. ft. Restaurant 1,000 to 26,000 sq. ft.	YES
<b>III</b>	Projected site traffic between 3,000 and 10,000 ADT <b>or</b> Projected peak hour traffic between 500 and 1,200 <b>or</b> Proposed installation or modification to traffic signals or elements of the roadway, regardless of project size	Single Family 315 to 1,000 units Apartment 450 to 1,500 units Lodging 330 to 1,100 occupied rooms General Office 270,000 to 900,000 sq. ft. Retail 70,000 to 230,000 sq. ft. Fast Food 6,000 to 20, 000 sq. ft.	YES
<b>IV</b>	Projected site traffic > 10,000 ADT <b>or</b> Proposed installation /modification of two or more traffic signals, addition of travel lanes to State Highway or proposed modification of freeway interchange, regardless of project size	Single Family > 1,000 units Apartment > 1,500 units Lodging > 1,100 occupied rooms General Office > 900,000 square feet Retail > 230,000 square feet	YES

## **Permit Level / Traffic Study level I**

Project ADT < 100 trips.

No proposed modifications to traffic signals or roadway elements or geometry.

The traffic study shall, at a minimum, incorporate traffic engineering principles and standards as presented in the State Highway Access Management Rule, Department standards, and national practices. Additional requirements and investigation may be imposed upon the applicant as necessary.

The Region Permits officer and/or the Region Traffic Engineer determine the need and requirements for a traffic impact study.

1. Study Area.

Defined by Region Permits Officer and/or Region Traffic Engineer.

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary.

Study area may be limited to or include property frontage and include neighboring and adjacent parcels. Identify site, cross, and next adjacent up and down stream access points within access category distance of property boundaries.

2. Design year.

Opening day of project.

3. Analysis Conditions and Period

Identify site traffic volumes and characteristics.

Identify adjacent street(s) traffic volume and characteristics.

4. Identify right-of-way, geometric boundaries and physical conflicts.

Investigate existence of federal or state, no access or limited access control line.

5. Generate access point capacity analysis as necessary.

Analyze site and adjacent road traffic for the following time periods: weekday A.M. and P.M. peak hours including Saturday peak hours. Identify special event peak hour as necessary (per roadway peak and site peak).

6. Design and Mitigation.

Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

## **Permit Level / Traffic Study Level II**

The traffic study shall, at a minimum, incorporate traffic engineering principles and standards as presented in the State Highway Access Management Rule, Department standards, and national practices. Additional requirements and investigation may be imposed upon the applicant as necessary.

The Region Permits officer and/or the Region Traffic Engineer determine the need and requirements for a traffic impact study.

### **Project ADT 100 to 500 trips.**

1. Study Area.  
Defined by Region Permits Officer or Region Traffic Engineer.  
The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary.  
  
Intersection of site access drives with state highways and any signalized and unsignalized intersection within access category distance of property line. Include any identified queuing distance at site and study intersections
2. Design Year.  
Opening day of project.
3. Analysis Period.  
Identify site and adjacent road traffic for weekday A.M. and P.M. peak hours.
4. Data Collection  
Identify site and adjacent street roadway and intersection geometries.  
Identify adjacent street(s) traffic volume and characteristics.
5. Conflict / Capacity Analysis  
Diagram flow of traffic at access point(s) for site and adjacent development.  
Perform capacity analysis as determined by Region Traffic Engineer.
6. Right-of-Way Access  
Identify right-of-way, geometric boundaries and physical conflicts. Investigate existence of federal or state, no access or limited access control line.
7. Design and Mitigation  
Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

### **Project ADT 500 to 3,000 trips or peak hour < 500 trips.**

Any proposed modification to traffic signals or roadway elements or geometry.

1. Study Area.  
Defined by Region Permits Officer or Region Traffic Engineer.  
The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary. An acceptable traffic study boundary, based on travel time, may be identified as a ten or twenty minute travel time or even by market area influence.

Intersection of site access drives with state highways and any signalized and unsignalized intersection within access category distance of property line. Include any identified queuing distance at site and study intersections.

2. Design Year.  
Opening day of project and five year after project completion. Document and include all phases of development (includes out pad parcels).
3. Analysis Period.  
Analyze site and adjacent road traffic for weekday A.M. and P.M. peak hours including Saturday peak hours. Identify special event peak hour as necessary (adjacent roadway peak and site peak).
4. Data Collection
  - a. Daily and Turning Movement counts.
  - b. Identify site and adjacent street roadway and intersection geometries.
  - c. Traffic control devices including traffic signals and regulatory signs.
  - d. Traffic accident data
5. Trip Generation.  
Use equations or rates available in latest edition of ITE Trip Generation. Where developed equations are unavailable for intended land use, perform trip rate study and estimation following ITE procedures or develop justified trip rate agreed to by the Department.
6. Trip Distribution and Assignment  
Document distribution and assignment of existing, site, background, and future traffic volumes on surrounding network of study area.
7. Conflict / Capacity Analysis.  
Diagram flow of traffic at access point(s) for site and adjacent development.  
Perform capacity analysis for daily and peak hour volumes
8. Traffic Signal Impacts. For modified and proposed traffic signals:
  - a. Traffic Signal Warrants as identified.
  - b. Traffic Signal drawings as identified.
  - c. Queuing Analysis
9. Right-of-Way Access  
Identify right-of-way, geometric boundaries and physical conflicts. Investigate existence of federal or state, no access or limited access control line.
10. Design and Mitigation.  
Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

## Permit Level / Traffic Study Level III

Project ADT 3,000 to 10,000 trips or peak hour traffic 500 to 1,200 trips.

Proposed installation or modification to traffic signals or roadway elements or geometry, regardless of project size or trip generation.

The traffic study shall, at a minimum, incorporate traffic engineering principles and standards as presented in the State Highway Access Management Rule, Department standards, and national practices. Additional requirements and investigation may be imposed upon the applicant as necessary.

The Region Permits officer and/or the Region Traffic Engineer determine the need and requirements for a traffic impact study.

1. Study Area.

Defined by Region Permits Officer or Region Traffic Engineer

The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary. An acceptable traffic study boundary, based on travel time, may be identified as a ten or twenty minute travel time or even by market area influence.

Intersection of site access drives with state highways and any intersection within 1/2 mile of property line on each side of project site.

2. Design Year.

Opening day of project, five years and twenty years after opening. Document and include all phases of development (includes out pad parcels).

3. Analysis period.

For each design year analyze site and adjacent road traffic for weekday A.M. and P.M. peak hours including Saturday peak hours. Identify special event peak hour as necessary (adjacent roadway peak and site peak).

4. Data Collection.

- a. Daily and Turning movement counts.
- b. Identify site and adjacent street roadway and intersection geometries.
- c. Traffic control devices including traffic signals and regulatory signs.
- d. Automatic continuous traffic counts for at least 48 hours.
- e. Traffic accident data.

5. Trip Generation.

Use equations or rates available in latest edition of ITE Trip Generation. Where developed equations are unavailable for intended land use, perform trip rate study and estimation following ITE procedures or develop justified trip rate agreed to by the Department.

6. Trip Distributions and Assignment.

Document distribution and assignment of existing, site, background, and future traffic volumes on surrounding network of study area.

7. Capacity Analysis.

- a. Level of Service (LOS) for all intersections.
- b. LOS for existing conditions, design year without project, design year with project.

8. Traffic Signal Impacts. For proposed Traffic Signals:

- a. Traffic Signal Warrants as identified.
- b. Traffic Signal drawings as identified.



- c. Queuing Analysis.
  - d. Traffic Systems Analysis. Includes acceleration, deceleration and weaving.
  - e. Traffic Coordination Analysis
9. Right-of-Way Access  
Identify right-of-way, geometric boundaries and physical conflicts. Investigate existence of federal or state, no access or limited access control line.
10. Accident and Traffic Safety Analysis. Existing vs. as proposed development.
11. Design and Mitigation.  
Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

### **Permit Level / Traffic Study Level IV**

Project ADT greater than 10,000 trips or peak hour traffic > 1,200 vehicles per hour.  
Proposed installation or modification of two or more traffic signals, addition of traffic lanes or modification of freeway interchange.

The traffic study shall, at a minimum, incorporate traffic engineering principles and standards as presented in the State Highway Access Management Rule, Department standards, and national practices. Additional requirements and investigation may be imposed upon the applicant as necessary.

The Region Permits officer and/or the Region Traffic Engineer determine the need and requirements for a traffic impact study.

1. Study Area.  
Defined by Region Permits Officer or Region Traffic Engineer  
The study area, depending on the size and intensity of the development and surrounding development, may be identified by parcel boundary, area of immediate influence or reasonable travel time boundary. An acceptable traffic study boundary, based on travel time, may be identified as a ten or twenty minute travel time or even by market area influence.  
  
Intersection of site access drives with state highways and any intersection within 1/2 mile of property line of each side of project site and any intersection or freeway interchange impacted by more than 500 peak hour trips.
2. Design Year.  
Opening day of project, five years and twenty years after opening. Document and include all phases of development (includes out pad parcels).
3. Analysis period.  
For each design year analyze site and adjacent road traffic for weekday A.M. and P.M. peak hours including Saturday peak hours. Identify special event peak hour as necessary (adjacent roadway peak and site peak).
4. Data Collection.
  - a. Daily and Turning movement counts.
  - b. Identify site and adjacent street roadway and intersection geometries.
  - c. Traffic control devices including traffic signals and regulatory signs.

- d. Automatic continuous traffic counts for at least 48 hours.
  - e. Traffic accident data.
5. Trip Generation  
Use equations or rates available in latest edition of ITE Trip Generation. Where developed equations are unavailable for intended land use, perform trip rate study and estimation following ITE procedures or develop justified trip rate agreed to by the Department.
  6. Trip Distributions and Assignment.  
Document distribution and assignment of existing, site, background, and future traffic volumes on surrounding network of study area.
  7. Capacity Analysis.
    - a. Level of Service (LOS) for all intersections.
    - b. LOS for existing conditions, design year without project, design year with project.
  8. Traffic Signal Impacts. For proposed traffic signals:
    - a. Traffic Signal Warrants as identified.
    - b. Traffic Signal drawings as identified.
    - c. Queuing Analysis.
    - d. Traffic Systems Analysis. Includes acceleration, deceleration and weaving.
    - e. Traffic Coordination Analysis.
  9. Right-of-Way Access  
Identify right-of-way, geometric boundaries and physical conflicts. Investigate existence of federal or state, no access or limited access control line.
  10. Accident and Traffic Safety Analysis. Existing vs. as proposed develop.
  11. Design and Mitigation.  
Determine and document safe and efficient operational design needs based on site and study area data. Identify operational concerns and mitigation measures to ensure safe and efficient operation pursuant to appropriate state highway access category.

## STUDY AND REPORT FORMAT

The Traffic impact study should follow the recommended format below. Traffic impact studies shall be presented by a firm or individual recognized by the Department of Transportation as capable of performing a traffic analysis and when necessary, include engineered drawings based on Department standards drawings and specifications.

- (1) INTRODUCTION AND SUMMARY
- (2) PROPOSED PROJECT
- (3) STUDY AREA CONDITIONS
- (4) ANALYSIS OF EXISTING CONDITIONS
- (5) PROJECTED TRAFFIC
- (6) TRAFFIC ANALYSIS
- (7) CONCLUSIONS
- (8) RECOMMENDATIONS
- (9) APPENDICES
  - a) Traffic Counts
  - b) Traffic Capacity Analysis
  - c) Accident Summary
  - d) Request for change of access (if applicable)

### (10) FIGURES AND TABLES

The following items shall be documented in the study:

- a) Site location – showing area roadways
- b) Site Plan  
Identify geometric / physical concerns relating to area, site and specific access points. Include adjacent street and access points.
- c) Existing roadway and traffic control features (number of lanes, lane widths, alignment, location of traffic signals, signs) Include off-system features as related to site plan and access point(s).
- d) Existing daily volumes (directional if possible) and peak hour turning volumes. Discuss traffic characteristics (vehicle mix, % make-up and any special vehicle requirements).
- e) Collision diagram summary.
- f) Site generated trip summary. Discuss trip/vehicle make-up and any special vehicle requirements. Discuss trip reduction strategies if applicable.
- g) Directional distribution of site generated traffic.
- h) Assignment of Non-site related traffic (existing, background and future). Document both existing and committed development, and when appropriate other background planned development traffic. Assignment of total future non-site traffic for design year.
- i) Assignment of Site Traffic
- j) Traffic Capacity Analysis  
Projected levels of service without the project – coincide with development phase years.  
Projected levels of service with the project (by development phase years)  
Recommended mitigation / improvement

(Scaled schematic drawings illustrating alignment, number of lanes, lane widths, signing, pavement markings. If traffic signal modifications are proposed, signal phasing, signal head locations, lane marking shall be shown.)