CRITERIA FOR DEVELOPMENT OF TRANSPORTATION IMPACT STUDIES

JULY 2019

DEPARTMENT OF PUBLIC WORKS

TRANSPORTATION SERVICES DIVISION

CITY OF GREELEY, COLORADO

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1. INTRODUCTION

A. General

This document contains the policies and guidelines necessary for the preparation of Transportation Impact Studies (TIS) for development proposals in the City of Greeley. The policies exist to ensure consistent and proper transportation (vehicles, bikes, buses and pedestrians) planning and engineering practices when land use actions are being considered. These guidelines provide a standard process, set of assumptions, set of analytic techniques, and presentation format to be used in the preparation of the TIS.

Transportation Impact Studies provide the developer, consultant, City Council and city staff with the information necessary to provide a balance between land use and transportation infrastructure. A Transportation Impact Study must obtain approval from the Transportation Services Division before zoning can vest. With Planned Unit Developments (PUD), a Transportation Impact Study must be submitted before the design of a Master Street Plan.

The purpose of a Transportation Impact Study is to evaluate the impact of a proposed development on the surrounding transportation system. Based on the information provided in the Transportation Impact Study, city staff determines the adequacy of the existing or planned transportation improvements. City staff will stipulate that certain items be the responsibility of the developer as a condition of development approval. Such items include additional right-of-way, street improvements, traffic signals, bus stops/shelters or transportation demand management programs that are necessary to mitigate transportation deficiencies adjacent to or on the proposed development site.

B. Applicant Responsibility

The responsibility for assessing the transportation impacts associated with an application for development approval rests with the Applicant. The City serves in a review capacity. The assessment of these impacts shall be contained within a TIS report as specified herein. It shall be prepared under the supervision of, and sealed by, a Licensed Professional Engineer in the State of Colorado with experience in traffic engineering and transportation planning/engineering. For all State Highways within the study area, the Applicant is required to meet the requirements of the Colorado Department of Transportation in addition to City requirements.

C. Capacity and Safety Issues

Development of property has a direct impact on transportation, including vehicular, transit, bicycle, and pedestrian traffic. The goal of the TIS is to address the traffic related issues that result from the new development and to determine the improvements required such that appropriate levels of service are safely maintained. The various objectives of vehicular movement, pedestrians, bicyclists, and others must be balanced in the development review process. A combination of elements is needed to provide streets that serve all transportation modes. The TIS will provide information and guidance as plans are developed and decisions made for the approved plan.

i. Vehicular Improvements

Examples of capacity and safety improvements for vehicular traffic include: road widening, turn lanes acceleration and deceleration lanes, intersection through lanes, traffic signals, stop signs, design speed adjustments, and modifications to access points.

ii. Pedestrian Considerations and Improvements

New developments should incorporate traffic calming measures that promote pedestrian safety. Examples of safe, comfortable, and convenient pedestrian services are narrower roadways with fewer lanes, short blocks, low traffic speeds, tree-lined sidewalks, smaller corner radii, well-defined crosswalks, median refuges and channelized islands in large street crossings, on-street parking, and bicycle lanes. Underpasses or overhead structures are other examples of safety improvements if vehicular traffic causes unsafe conditions for pedestrians, space is available, and construction is feasible.

iii. Bicycle Improvements.

The addition of on-street bicycle lanes or off-street bicycle paths may be needed to achieve connectivity between the proposed project and the existing bikeway system.

iv. Transit Improvements.

Examples of Transit Traffic Improvements include accommodation of public transit facilities such as buses, bus stops, bus bays, shelters, stations, and transit stop facilities.

v. Adequate Public Facilities

It is essential that development occur only when adequate municipal or public facilities and services are available or will be available concurrent with development. For developments occurring on roads that are not identified within the 2 year budgetary process for improvement, developers will be responsible for ensuring safe and efficient vehicle travel. The traffic impact study to be provided by the developer and accepted by the City shall be required in order to make a final adequacy determination.

D. Traffic Coordination Meeting

i. Purpose

The purpose of the traffic coordination meeting is to determine and document the parameters for the study of traffic impacts for a specific development project. The parameters determined in the meeting represent general agreement between the City and the consulting engineer, but they may not be all-inclusive. The City retains the right to require any additional information and/or analysis to complete an evaluation of the proposed development project.

a. Meeting Setup and Content

The Applicant is strongly encouraged to coordinate a meeting through their identified Community Development representative with the Transportation Services Division to discuss the TIS requirements and determine the base assumptions. It is incumbent upon the Applicant to bring a completed or partially completed Transportation Impact Study Base Assumptions Form and be prepared to discuss the following:

1. Previous TIS prepared for the site, if any;
2. Exhibit showing the location of the site;
3. Proposed access and its relationship to adjacent properties and their existing/proposed;

4. Preliminary estimates of the site's trip generation and trip distribution at build-out;
5. Identification of proposed year of build-out;
6. Trip adjustment factors proposed, if any;
7. Approved and proposed developments in the study area, and the associated committed roadway improvements;
8. Anticipated multimodal (roadway, bike, pedestrian, transit) improvements to be provided by the Applicant;
9. Phasing plan if applicable;
10. Potential bicycle and pedestrian connections to the nearest existing or future attraction (ex. park, grocery store, bus stop), within 1320' of the site. This distance may be increased up to 1.5 miles for residential projects near existing or proposed school sites;
11. Description of Surrounding Land Use - Mention the existing and proposed land uses surrounding the proposed development;
12. Description of Surrounding Transportation System - Describe the existing streets, intersections, transit, bike and pedestrian facilities. Include information such as street classification, lane configuration and number, posted speed limits, offset intersections, existing traffic control, existing signal timing, and existing driveways across from or adjacent to the site;
13. Reference to applicable City planning documents (ex. Bicycle Master Plan, Transportation Plan etc.);
14. Depending on anticipated trip generation, the City may ask for recent crash history data.

b. Timeliness

If a coordination meeting was conducted more than six months prior to the submittal of the TIS, the City reserves the right to require another meeting.

c. Meeting Result

1. Study area for the impact analysis;
2. Coordination requirements with other developments/developers within the study area;
3. Existing intersection counts;
4. Intersections to be studied in detail;
5. Background traffic volume forecasts;
6. Location of the nearest bicycle, pedestrian and transit facilities;
7. Special analysis needs. (Non-traditional peak hour volumes for some uses, neighborhood impacts, access management plans, etc.); and
8. For studies involving signalized intersection analysis the local entity will provide detailed assumptions for evaluation methodology and/or software files to be utilized.

2. STUDY PARAMETERS

A. Types of Study

i. Master TIS

Where large complex projects are planned or a project is phased over a multi-year build-out, it may be appropriate to prepare a Master TIS for the initial land use

action followed by periodic updates for specific phases. For Use by Special Review (USR) submittals, a Master TIS may be required to include surrounding development.

The Master TIS must include overall phasing of improvements to coincide with project phasing. Updates to the Master TIS shall be submitted with the land use applications for the specific phases, and shall meet the requirements for the Individual site Transportation Impact Study. This type of study may also be required for annexations and zoning applications for large tracts of land.

ii. Individual Site Transportation Impact Study

An individual site TIS is prepared for a project that stands alone or is a phase of a master development. It can be for a new use in an existing or remodeled building, the construction of a new building (either single occupant or multi-user), construction of multiple buildings, or the construction of new residential or commercial development.

B. Levels of Analysis

For an individual site Transportation Impact Study, the following levels of analysis apply. These criteria are intended as guidelines and may be revised, when warranted, by the City Traffic Engineer:

i. Full TIS

- Site generated traffic exceeds 1,000 trips/day and/or 100 peak hour trips.
- A new high volume access is requested for an arterial street or State Highway.

ii. Intermediate TIS

- Daily vehicle trip-end generation is between 501 and 1,000 inclusive.
- The peak hour trip generation is between 51 and 100.
- No access onto Arterials or State Highways is being requested.
- The Level of Service (LOS) of the adjacent facility when the development is completed equals or exceeds the minimum allowable LOS standard established for that facility.

iii. Transportation Memorandum

- Daily vehicle trip-end generation is less than or equal to 500, and/or the peak hour trip generation is less than 20.
- Any new access requests are for local streets or minor collector streets only.

iv. No TIS Required

Upon submittal of a Transportation Base Assumptions Form by the Applicant and/or written acceptance by the Local Entity Engineer, the TIS requirement may be waived if all of the criteria below are satisfied:

a. Vehicular Traffic

- Daily vehicle trip-end generation is less than 200 and/or the peak hour trip generation is less than 20.

- There are no additional proposed minor or major street intersections on major collectors, arterials, or State Highways.
- If the property is being redeveloped, the increase in the number of vehicular trips for the proposed use does not exceed the trip generation from the existing use by more than 20 peak hour trips or 200 daily trip ends.
- Any change in the type of traffic to be generated (i.e. the addition of new truck traffic) does not adversely affect the traffic currently planned for and accommodated within, and adjacent to, the property.
- The scale or use of the proposed development or redevelopment is not likely to cause less than acceptable levels of service on the adjacent public streets, accesses, and intersections; and
- The proposed development or redevelopment is not in the vicinity of a street or intersection with a history of safety and/or accident problems.
- There is no change of land use with access on to a State Highway.
- Access points adhere to adopted City standards.

b. Pedestrian Traffic

Paved pedestrian facilities exist or will be constructed on, or adjacent to, the site; or, the proposed use will not generate any new pedestrian traffic.

c. Bicycle Traffic

Paved bike lanes or paths exist or will be constructed on, or adjacent to, the site; or, the proposed use will not generate any new bicycle traffic.

d. Transit

A transit stop exists or will be constructed on, or adjacent to, the site; or the proposed used will not generate the need for additional transit connections.

v. Revisions and Updates

A revision or update to an approved TIS may be required when a previously approved land use action proposes an expansion, a change to access, or a change in use where new trip generation estimates exceed the original trip-end generation estimates. If the currently approved study was prepared within the last three years, an amendment letter addressing the changes may be accepted and satisfy the requirements of this guideline. If an existing TIS is more than three years old, a new TIS is likely to be required.

C. Project Description

A description of the proposed project will be prepared and include the type of land use and size of the proposed project (number of dwelling units or building square footage). Any proposed phasing will be discussed and the anticipated completion date established. A figure depicting the proposed site plan will also be included and the proposed vehicular access locations will be described. This section will also include a description of how pedestrian, transit and bicycle travel will be accommodated within the proposed site plan. This will include a discussion of types of sidewalks (attached/detached), pathways, bus stops and connections to local and perimeter destinations.

The project description shall also include a description of existing and proposed land uses surrounding the proposed development and any anticipated transportation connections between the developments.

Discussion of the surrounding transportation system including existing streets, intersections, transit, bike and pedestrian facilities, street classifications, lane configurations, posted speed limits, offset intersections, existing traffic control, existing signal timing, and existing driveways across from or adjacent to the site. Also include information regarding planned improvements in the area that are not part of the proposed development.

D. Analysis Horizons

Three study horizons or study timeframes are required for a Master or Full TIS analysis: existing, short range, and long range. It may be acceptable for the short range and long range horizons to be identical for some large projects. See Table 1 for more detail.

Table 1. Analysis Horizons

Existing Condition Single Phase Development < 1500 daily trips	Build-out Year Only Site generated trips
Short Range Horizon Single Phase Development >= 1500 daily trips	Build-out Year Five (5) Years after Build-out Year
Long Range Horizon Multi-Phase Developments (such as PUDs)	Determined by the Transportation Services Division based on project size, location and surrounding traffic conditions. Typically, each major phase of development is analyzed along with a 20-year projection after opening year.

i. Long Range Horizon

The intent of the long range planning horizon is to evaluate the implications of the fully developed proposed project on the long range traffic condition. Data from the current official North Front Range Transportation (MPO) regional computer model is available by contacting the MPO directly. This study horizon is for the City's use as an indicator of traffic for planning purposes and the determination of the necessary Right-of-Way. The City may elect to disallow use of the regional model when the data is deemed unreliable.

E. Study Area

The limits of the transportation network study area shall be defined for all levels of TIS analysis. The limits of the transportation network to be studied shall be based on the size and extent of the application for development approval, the existing and future land uses, and traffic conditions on and near the site.

The limits of the study area shall be agreed upon at the coordination meeting. The following criteria in Table 2 are used to determine the limits of the study area:

Table 2. Study Area Limits

Single Phase Development < 500 daily trips	• All Site Access Drives • Signalized and/or potential signalized intersections adjacent to development.
Single Phase Development 500 >=daily trips <=1500	• All Site Access Drives • Signalized and/or potentially signalized Intersections within ¼ mile of development.
Single Phase Development daily trips >1500	• All Site Access Drives • Signalized and/or potentially signalized intersections within ½ mile of development.
Multi-Phase Developments (such as PUDs)	Determined by the Transportation Services Division based on project size, location and surrounding traffic conditions. Typically within one (1) mile of the proposed development is analyzed.

F. Evaluation Elements

i. Master TIS

The purpose of the Master Transportation Impact Study is to provide a general sense of the overall impacts to the transportation system and to identify the larger scale improvement needs necessitated by the proposed zoning (i.e. widening of arterials, connecting key gaps in the street system, etc.).

The Master Transportation Impact Study does not need to include intersection analyses, although it may, at the Applicant's discretion, if the Applicant intends to proceed with a specific phase of the project immediately following approval of the Overall Development Plan. Also, in cases where a developer seeks vesting with an Overall Development Plan, the Master Transportation Impact Study is required to present all the detailed information required in an Individual Site Transportation Impact Study.

For example, for a large General Development Plan or Overall Development Plan with a multi-phase build-out, the Master TIS would not only address the overall project, but also identify key measurable criteria that would trigger the construction of some incremental portion of the overall infrastructure improvement plan. Typically at the Preliminary Planned Unit Development (PUD) or Preliminary Subdivision stage, with each phase of the project a new individual site TIS specific to that phase would be

prepared. This new study would verify the accuracy of the original traffic projections, both on-site and background, and check the criteria identified for infrastructure improvements, and other pertinent information.

The key elements of a Master TIS shall include the following:

a. Figures

Site Location – Clear area map showing site location and surrounding area of influence.
Conceptual Plan of Proposed Development – Detailed figure showing conceptual plan of proposed development including access points, circulation, and land use components.
Surrounding Transportation System – Include all major streets, minor streets adjacent to site, planned improvements not part of proposed development, and site boundary. Also show transit, bicycle, and major pedestrian routes, if applicable, along with right-of-way widths and signal locations.
Existing and Anticipated Area Development – Figure showing existing and future land uses in area.
Existing Traffic Volumes – Include daily traffic volumes and peak hour traffic volumes. Turning movements are required for the peak hours. Nontraditional peak times must be identified and analyzed.
Distribution – Figure showing portion (by percentages) of site traffic approaching and departing proposed development.
Site Traffic – Include daily traffic volumes and peak hour traffic volumes for each horizon year (if separate phasing is expected). Turning movements are required for the peak hours. Show circled "blow-ups" of each study intersection on the same figure.
Off-site Future Traffic - Include daily traffic volumes and peak hour traffic volumes for each scenario (horizon year). Turning movements are required for the peak hours. Show circled "blow-ups" of each study intersection on the same figure.
Total Traffic - Include daily traffic volumes and peak hour traffic volumes for each scenario (horizon year). Turning movements are required for the peak hours. Show circled "blow-ups" of each study intersection on the same figure.

b. Assessment Information

1. Conformity with the adopted Transportation Master Plan including any adopted access control plans.
2. Appropriateness of access locations;
3. Multi-modal and Traffic Demand Management (TDM) opportunities;
4. Pedestrian/bike requirements and/or improvements;
5. Safety and accident analysis. Other items as requested by the Traffic Engineer and agreed to in the coordination meeting; and
6. Neighborhood and public input issues.

c. Improvement Analysis

The anticipated results of any proposed or planned transportation improvements must be given in the study. The consultant may also recommend changes to planned improvements that may result in improved operating characteristics of the transportation system.

d. Conclusions and Recommendations

Recommended improvements for safe and efficient operation of the transportation system such as:

- Street/intersection/driveway geometrics and alignment
- Auxiliary turn lanes
- Traffic control devices-signalized or unsignalized
- Traffic signal operation such as timing and coordination
- Pedestrian and bicycle facilities and/or safety measures
- Traffic mitigation measures
- Transit stop additions or improvements

ii. Full TIS

The elements of a Full TIS are included below.

a. Figures

- Site Location – Area map showing site location and area of influence.
- Conceptual Plan of Proposed Development – Detailed figure showing conceptual plan of proposed development including access points, circulation, and land use components.
- Surrounding Transportation System – Include all major streets, minor streets adjacent to site, planned improvements not part of proposed development, and site boundary. Also show transit, bicycle, and major pedestrian routes, if applicable, along with right-of-way widths and signal locations.
- Existing and Anticipated Area Development – Figure showing existing and future land uses in area.
- Existing Traffic Volumes – Include daily traffic volumes and peak hour traffic volumes. Turning movements are required for the peak hours.
- Distribution – Figure showing portion (by percentages) of site traffic approaching and departing proposed development.
- Site Traffic – Include daily traffic volumes and peak hour traffic volumes for each horizon year (if separate phasing is expected). Turning movements are required for the peak hours. Show circled "blow-ups" of each study intersection on the same figure.
- Off-site Future Traffic - Include daily traffic volumes and peak hour traffic volumes for each scenario (horizon year). Turning movements are required for the peak hours. Show circled "blow-ups" of each study intersection on the same figure.
- Total Traffic - Include daily traffic volumes and peak hour traffic volumes for each scenario (horizon year). Turning movements are

required for the peak hours. Show circled "blow-ups" of each study intersection on the same figure.

b. Assessment Information

- Conformity with the adopted Transportation Master Plan, including any adopted access plans;
- Trip generation;
- Intersection turn movement analysis;
- Peak hour intersection and driveway level of service;
- Appropriateness of access locations;
- Location and requirements for turn lanes or acceleration/deceleration lanes at accesses or intersections, including recommendations for taper lengths, storage length, acceleration/deceleration lengths, and other geometric design requirements per the City or CDOT requirements;
- Sight distance evaluations and recommendations (intersection, stopping, passing);
- Multi-modal and TDM opportunities;
- Continuity and adequacy of pedestrian and bike facilities to the nearest attraction (existing or imminent) within the study area;
- Traffic signal and stop sign warrants;
- Progression analysis for signalized intersections;
- Neighborhood and public input issues;
- Safety and accident analysis; and
- Other items as requested by the Local Entity Traffic Engineer and agreed to in the coordination meeting.

c. Improvement Analysis

The anticipated results of any proposed or planned transportation improvements must be given in the study. The consultant may also recommend changes to planned improvements that may result in improved operating characteristics of the transportation system.

d. Conclusions and Recommendations

Recommended improvements for safe and efficient operation of the transportation system such as:

- Street/intersection/driveway geometrics and alignment
- Auxiliary turn lanes
- Traffic control devices-signal or unsignalized
- Traffic signal operation such as timing and coordination
- Pedestrian and bicycle facilities and/or safety measures
- Traffic mitigation measures
- Transit improvements or incentives

iii. Intermediate TIS

The Intermediate TIS will contain all elements required for a Full TIS, excluding the Long Range Horizon Analysis.

iv. Transportation Memorandum

At a minimum, the following issues should be considered for submittal in a Transportation Memorandum.

1. Trip Generation;
2. Appropriateness of access locations;
3. Location and requirements for turn lanes or acceleration/deceleration lanes at the access, including recommendations for taper lengths, storage length, acceleration/deceleration lengths, and other geometric design requirements per City or DOT requirements;
4. Sight distance evaluations and recommendations (intersection, stopping, passing);
5. Continuity and adequacy of pedestrian, transit and bike facilities within the study area;
6. Appropriateness of the existing roadway signing and striping.
7. Neighborhood and public input issues; and
8. Other items as requested by the Local Entity Traffic Engineer.

3. TRAFFIC VOLUMES

A. Existing Traffic

i. Roadway Traffic Volumes/Traffic Counts

Current peak hour traffic counts, as specified by the Local Entity Engineer, shall be obtained for the roadways within the study area for one, non-holiday Tuesday, Wednesday, or Thursday. The "peak hours" shall be determined based on a 24-hour traffic count. Each peak hour count shall include fifteen (15) minute count data to clearly identify the peak hours. Nontraditional peak hours must be identified for projects near schools. The City may ask for this information to verify accurate peak hour information.

Average daily counts on local streets are required. All data shall be collected in accordance with latest edition of the ITE Manual of Traffic Engineering Studies or as directed by the Traffic Services Division. The data used in the study should have been collected within the past two years. Adjust counts for average conditions due to seasonal differences when necessary. Existing daily traffic volumes may be obtained from the Traffic Services Division if available.

When applicable to the project, pedestrian and bicycle counts will be required. Vehicle classification counts may be required.

Volumes shall be no more than one year old (from the date of application submittal). The source(s) of each of the existing traffic volumes shall be explicitly stated (CDOT counts, new counts by Applicant, City counts, etc.) Summaries of current traffic

counts shall be provided. The City may require the use of seasonal adjustment factors depending on when data was collected and if the project is considered to be in an affected area.

ii. Intersection Level of Service

Peak hour intersection levels of service shall be determined for existing signalized and unsignalized intersections within the study area. Locations to be analyzed will normally be set in the coordination meeting. The analysis shall use procedures described in the latest edition of the Highway Capacity Manual. Any roundabout analysis must use RODEL for the capacity analysis.

iii. Traffic Signal Needs

Traffic signals are only accepted when they are located to provide efficient progression. Typical spacing is at ½ mile intervals. In unique situations, the Transportation Services Division may approve signals at other spacing.

Traffic signals may only be installed when they satisfy warrants in the Manual of Uniform Traffic Control Devices and are approved by the Traffic Services Division. The applicant may be responsible for a percentage of the cost for traffic signal installations warranted by their development that is not covered under the transportation impact fee.

B. Background Traffic

i. Short Range Volume Projections

The traffic forecast for the short range planning horizon shall be the sum of existing traffic volumes plus cumulative development traffic from approved land use actions, plus background growth (as adjusted to avoid duplicative consideration of the identified development traffic from the approved land uses already considered). The cumulative development traffic shall be based, in part, on the A.M. and P.M. peak hour and Average Daily Traffic (ADT) data established and accepted from planned and approved land use actions within and near the study area.

In Greeley, 100% of the committed trips from the build-out of planned and approved projects in the study area must be included in the short range volume projection. The assumed baseline surface transportation network should reflect existing facilities (without the proposed project improvements) plus any committed improvements by the Local Entity, other public agencies, and/or other approved land uses within the study area.

ii. Long Range Volume Projections

Long range peak hour planning horizon traffic volume projections shall be based on one or more of the following as determined in the coordination meeting:

1. Straight line projection for the build-out year between the existing traffic volumes and the twenty year North Front Range Transportation and Air Quality Planning Council's (MPO) regional model forecast, CDOT rates; or
2. Historical traffic counts projected to the build-out year (at least three years of traffic data should be used for this); or

3. Area-wide traffic count analysis which considers traffic volume trends in the study area's circulation system and uses proportion/extrapolation methods; or
4. Growth rate agreed upon with the Local Entity Engineer.

C. Project Traffic

i. Trip Generation Rate

Trip generation should be calculated from the latest data contained within the Institute of Transportation Engineers' (ITE) Trip Generation Manual or be based on local data approved by the Local Entity Engineer. Other industry publications (such as the ITE Journal or other sources) may be approved by the Local Entity. Data limitations, data age, choice of peak hours (for the land use or adjacent street traffic), choice of independent variables, and choice of average rate versus statistically significant modification should be discussed in the study when appropriate. When data is not available for a proposed land use or a modification is proposed, the Applicant must conduct a local trip generation study following procedures prescribed in the ITE Trip Generation Manual and provide sufficient justification for the proposed generation rate. This rate must be approved by the Local Entity prior to its use in the written study.

ii. Trip Generation Table

The Applicant shall prepare a Trip Generation Table, listing each type of land use within the site at build-out, the size and unit of measure for each land use, trip generation rates (total daily traffic, A.M. and P.M. peaks), directional splits for each in/out driveway, the resultant total trips generated. The data source shall be stated (state ITE land use code, if used). Build-out land uses and trip generation shall be used for both the short range and long range planning horizons. Land use action proposed that is of a type that build-out in the short-range is not feasible due to the size of development (as agreed upon by the Local Entity at the coordination meeting), may propose phases (such as 2-year increments) for the development.

iii. Preliminary Land Use Assumptions

The trip generation values contained in studies submitted prior to the establishment of a site-specific development plan shall be based on the maximum number of dwelling units permitted for the approved or proposed land us or zoning, and/or the maximum trip generation rates for the non-residential development proposed land use action per ITE 10th Edition Trip Generation Manual. When a TIS is being developed for a project with an established site-specific development plan, trip generation shall be based on actual dwelling unit counts and square footage(s) proposed on the final plan.

iv. Committed Trips/Capacity

To assure the public and the Local Entity that the traffic impact analysis adequately addresses the full impact of the development, the trip generation stated in the TIS will establish the maximum number of trips permitted entering and exiting the development. If the amount of committed trips is reached prior to full occupancy, the Local Entity reserves the right to request from the owner, at the owner's expense, supplemental traffic analyses prior to the issuance of additional building permits. This information shall demonstrate that uncommitted capacity is available on the transportation network to serve the excessive trips.

v. Adjustments to Trip Generation

Trip-making reduction factors may be used after first generating trips at full ITE rates or pre-approved rates from other sources. These factors fall into two categories: those that reassign some portion of generated trips to the background stream of traffic, and those that remove or move generated trips. In all cases, the underlying assumptions of the ITE trip generation rates must be recognized and considered before any reductions are used in the TIS. Several situations will be closely reviewed. One is when the traffic study assumes rates where the collection of mixed uses, such as at a shopping center, result in lower peak hour trips than when applying individual rates to each land use. Another is when reductions in the trip generation rates are assumed based on reductions due to travel demand management. Finally, adjustments may be considered for higher than typical mode split. Adjustments to trip generation must be agreed to by the Local Entity Engineer during TIS scoping.

1. Pass-by Trips

This first category may be considered when trips to the proposed development currently exist as part of the background traffic stream, referred to as a pass-by trip. Pass-by percentages identified in the ITE Trip Generation report or other industry publications may be considered with appropriate explanation and documentation. Pass-by traffic must remain assigned to driveways and access points. They are not additive to the background traffic stream. A technical appendix, table or map that illustrates the re-diversion of pass-by trips is required.

2. Internal Site Trips/TDM

Analytic support documentation of internal site trips, transit use, and TDM (Transportation Demand Management) actions shall be provided to show how trip adjustments are derived. Optimistic assumptions regarding transit use and TDM actions will not be accepted unless accompanied by specific implementation proposals that will become a condition of approval. Such implementation proposals must have a high expectation of realization within a 5-year period after project initiation.

3. Mode Split

Mode split assumptions and subsequent reduction in vehicular trips may be considered with appropriate explanation and documentation.

vi. Trip Distribution

Trip distribution must be documented in the TIS. It may be based on the professional engineer's judgment applied to one or more of the following: regional MPO traffic volume projections, gravity model, market analysis, existing traffic flows, or applied census data. Regardless of the basis of the estimates, the procedures and rationale used in determining the trip distributions must be fully explained and documented.

vii. Trip Assignment

The project traffic will be assigned to the roadway system according to the trip distribution established above. The resulting project site generated traffic and total site traffic will be depicted on figures for each analysis horizon. These figures will include peak hour traffic volume information, plus daily traffic volume information for

the City of Greeley. Separate maps or values are required when the trip distribution differs by more than 10% between the short and long range analysis horizons.

viii. Driveway Access

The design, number, and location of access points to collector and arterial roadways must be submitted for approval by the Local Entity Engineer. State Highway accesses require the issuance of an Access Permit from CDOT. The number of access points must be kept to a minimum and be designed to be consistent with the type of roadway facility. If multiple adjacent roadways are available for access, access should be taken from the lowest classified roadway available. Access points will be reviewed and approved by the Local Entity Engineer based on the following information:

1. Access location(s) as shown on the site plan.
2. Proposed traffic turning movements.
3. Analysis of on-site (driveway) stacking/queuing and impacts to adjacent streets.
4. Signalization requirements and design in accordance with these guidelines.
5. Geometric design of the access and proposed improvements to the Local Entity facilities in accordance with these standards.
6. Compliance with the CDOT State Highway Access Code and any adopted access management plans if access is requested to a State Highway.

4. PROJECT IMPACTS

A. Significant Negative Impacts

This section applies primarily to vehicular related impacts associated with the proposed project. A project is defined as significantly impacting a study intersection when one of the following criteria are satisfied:

i. Signalized/Major Intersections

1. When the added project traffic causes movements, approaches or the overall intersection to fail the minimum acceptable level of service standards in Table 1.27.1; or
2. When the background traffic conditions (without project traffic) causes an intersection to fail the minimum acceptable level of service standards; and when the project traffic causes more than a two (2) percent increase in the overall intersection delay; or
3. When added project traffic is determined to create potential safety problems.

ii. Unsignalized/Minor Intersections

1. When the added project traffic causes movements at an intersection or the overall intersection to fail the minimum acceptable level of service standards; or
2. When queuing would create impeded traffic flows and/or excessive congestion; or
3. When added project traffic is determined to create potential safety problems.

iii. Level of Service Standards

a. Intersection Delay

The principal objective of the intersection level of service traffic impact analysis is to identify whether the traffic from the proposed project when added to the short

range planning horizon traffic will result in a significant impact and an unacceptable level of service. For definition purposes, the thresholds for acceptable level of service are as shown in Table 1.27.1 on the following page.

Table 3. Acceptable Level of Service Standards

Intersection Component	Major Intersection[1]	Minor Intersection[2]
Overall (City Limits)	LOS C	LOS C
Overall (LREGA)[3]	LOS D	LOS C
Any Leg	LOS D	LOS E
Any Movement	LOS E	LOS F

[1] Includes all signalized and unsignalized arterial/arterial and arterial/major collector intersections.
[2] Includes all unsignalized intersections and high volume driveways.
[3] Long Range Expected Growth Area

*On State and US Highways overall LOS D is acceptable.

Transportation Impact Study

Base Assumptions Form

Project Information					
Project Name:					
Project Location:					
TIS Assumptions					
Type of Study	Master:	Full:	Intermediate:	Memo:	No TIS Req:
Study Area Boundaries	North:	South:	East:	West:	
Study Years	Short Range:		Long Range:		
Future Traffic Growth Rate					
Study Intersections	1.		5.		
	2.		6.		
	3.		7.		
	4.		8.		
Time Period For Study	Peak Hour:				
Trip Generation Rates					
Trip Adjustment Factors	Passby:		Captive Market:		
Overall Trip Distribution	See attached sketch				
Mode Split Assumptions					
Committed Roadway Improvements					
Other Traffic Studies					
Areas Requiring Special Study					
Is the project within 1 mile of a State Highway?	**Yes**_____ **No**_____				

Date: _____

Traffic Engineer: _____

Local Entity Staff: _____

Transportation Impact Study

Pedestrian Analysis Form

INSTRUCTIONS: Identify the pedestrian destinations within 1320' (1.5 miles for schools) of the project boundary in the spaces below. The pedestrian analysis for the facility/corridor linking these destinations to the project site will be based on the directness, continuity, types of street crossings, walkway surface condition, visual interest/amenity, and security of the selected route(s).

	Name	Distance from Project
Recreation		
Residential		
Institution (school, church, etc.)		
Office/Business		
Commercial		
Industrial		
Other		