APPENDIX D
2001 CASA GRANDE MULTIMODAL TRANSPORTATION STUDY TRAFFIC IMPACT ANALYSIS PROCEDURES

9. TRAFFIC IMPACT ANALYSIS PROCEDURES

This chapter has been established to provide uniform guidelines for preparing Traffic Impact Analysis (TIA) for new developments or additions to existing developments within the City of Casa Grande. These procedures will provide the developer, the developer's consultant, City Council and staff with information necessary to provide a balance between land use and transportation infrastructure needs. The procedures presented are based on those from the 2000 Pinal County Transportation Plan.

PURPOSE

In general, the purposes of the TIA procedures are to:

- Provide information to the permit applicant on specific requirement of the analysis
- Ensure consistency in the preparation and review of TIA reports

REQUIREMENT

A TIA for City streets will be required for all new developments, or additions to existing developments, where the ultimate development of the site generates 100 or more trips per average weekday. A more detailed analysis will be required for sites generating 500 or more trips per day (see Table 9-1). The specific level of detail for a particular impact statement may vary according to the density of the proposed development, existing and planned development, and the existing roadway conditions. Those who prepare the analysis must obtain agreement from the Department of Public Works on the specific requirements. Traffic analysis for developments on State highways must be performed in accordance with ADOT's *Traffic Impact Analysis for Proposed Development*.

TABLE 9-1. TRAFFIC IMPACT ANALYSIS REPORT REQUIREMENTS

	Standard Report (500 or more trips per day)	**Limited Report (100 or more trips per day)**
Proposed Development	X	X
Study Area	X	
Analysis of Existing Conditions	X	X
Future Traffic Forecasts	X	
Traffic and Improvement Analysis	X	
Site Access	X	X
Level of Service	X	
Improvement Analysis	X	X
Traffic Control Needs	X	X
Traffic Safety	X	X
Improvement Costs	X	X

The analysis of roadway improvements in the TIA will also follow the access management guidelines as discussed in Chapter 8, Access Management.

The City makes the final decision on the requirements for a TIA. A developer will first estimate the number of vehicle trips generated by the development to determine if a TIA is required. The developer must obtain concurrence from the Department of Public Works on the number of trips generated by the development.

COORDINATION

The preparer of a TIA must coordinate with the Department of Public Works and, where appropriate, Pinal County and ADOT. At least one meeting must be held with the Department of Public Works to review the scope of the analysis and to agree on specific requirements.

TIA REPORT CONTENTS

Proposed Development

The Traffic Impact Analysis report should include a description of the following:

- Proposed site location and site plan
- Land use
- Development phasing

A map of the study site is required. The description of the proposed development should provide as much detail as possible including:

- Specific tenants, if known
- Specific types of uses such as banks, fast food restaurants, etc.
- Intensity of each land use in terms of number of dwelling units or square foot of gross building area

The projected opening date for the proposed development must be included. In the case of a large phased development, the specific project completion dates for each phase must also be included.

Study Area

A description of the existing and future land uses in the study area must be described in the TIA report. The study area will vary according to the extent of the proposed development. A large development will generate more traffic and influence a larger geographical area

than a smaller development. The project type and size in accordance with the criteria in Table 9-2 will determine the minimum study area. The preparer of the TIA must contact the Department of Public Works to obtain agreement on the study map. A map of the study area is required.

TABLE 9-2. CASA GRANDE TIA STUDY AREA REQUIREMENTS

Ultimate Development Characteristics	Study Horizons[a]	Minimum Study Area On the City Road(s)[c]
Small Development	– Opening year	– Site access drive – Adjacent signalized intersections and/or major unsignalized street intersections
Moderate, single phase 500 – 1,000	– Opening year – 2-5 years after opening	– Site access drive – All signalized intersections and/or major unsignalized street intersections within ½ mile
Large, single phase >1,000 peak hour trips	– Opening year – 5 years after opening[b] – 3-10 years after opening	– Site access drives – All signalized intersections and/or major unsignalized street intersections within one mile
Moderate or Large Multi-phase	– Opening year – 5 years after opening[b] – 3-10 years after opening	– Site access drives. – All signalized intersections and major unsignalized street intersections within ½ mile

(a) Assume full occupancy and build-out.
(b) Not required if the traffic impacts of the project are fully mitigated 10 to 15 years after opening with existing conditions plus 5-year programmed improvements.
(c) An enlarged study area may be required for certain projects.

Analysis of Existing Conditions

The report must include an analysis of the existing roadway and traffic conditions including a discussion of:

- Physical roadway conditions
- Traffic volumes

- Traffic control of roadways and intersections (stop signs, traffic signals, etc.)
- Roadway and intersection level of service
- Safety conditions

The description of existing roadway conditions should include:

- Roadways serving the site
- Roadway cross-section and lane configuration
- Lane configuration of intersection approaches
- Posted speed limits
- Location of existing driveways
- Existing traffic signal timing and phasing

Information on 24-hour traffic volumes on the major roads in the study area should be provided. With the approval of the Department of Public Works, estimated 24-hour traffic volumes can be used in the case of low volume roads. Recent and available traffic counts can be used if they are less than two years old. Several factors may be used to adjust the traffic volumes. There should be peak-hour turning-movement counts taken at all major intersections within the study area. At the discretion of the Department of Public Works the requirement for turning movement counts at low volume intersections may be waived.

Capacity analysis will be conducted for all required locations using the procedures prescribed in the latest edition of the Highway Capacity Manual (HCM).

The existing roadway system should be reviewed from a safety perspective. The three-year accident history should be analyzed to identify accident problems and patterns.

Future Traffic Forecasts

Future traffic volumes will be estimated for the roadways in the study area for both site and non-site traffic. The estimation of future traffic volumes will include:

- Generation of site traffic
- Estimation of non-site traffic (including pass-by trips, if applicable to the type of land use)
- Distribution of site traffic to other land uses and activity centers
- Assignment of site traffic to the study area roadways

Site traffic estimation will be done for each horizon year to be analyzed. Traffic volumes for the site will be estimated using the trip generation rates or equations published in the latest edition of ITEs' *Trip Generation*. Local or other trip generation rates may be used if approved by the Department of Public Works.

The distribution of site traffic to and from potential origins and destinations must be estimated. The distribution should be indicated in a tabular form or illustrated in a figure as percentages of total site traffic.

The projected site traffic volumes will be assigned to the roadways using the distributions previously discussed and added to the non-site traffic. The non-site or background traffic is the traffic that would be on the roadways if the site were not developed. The non-site traffic may be estimated using:

- Trends and growth rates
- Combination of trends and the estimation of other proposed land uses
- Application of the Casa Grande traffic forecast model

The site and non-site traffic volumes will be combined to give the total estimated traffic volumes on the roadways.

Traffic and Improvement Analysis

The roadways in the study area will be analyzed using the projected total traffic volumes. The analysis of the roadways and intersections will include:

- Site access
- Level of service of the roadways and intersections
- Traffic control needs
- Improvement analysis
- Traffic safety
- Improvement costs

Site Access

The access drives should be analyzed with respect to capacity, traffic operations, and safety considerations. Access drives should be designed and located in accordance with the Department of Public Works guidelines.

Level of Service

Level of service analysis will be conducted for the major intersections for the following conditions:

- Base roadway conditions without site traffic for the horizon year(s)
- Base roadway conditions with total traffic (non-site plus site traffic) for the horizon years(s)
- Roadway and intersection improvements, if required, for horizon year(s)

The base roadway conditions include the existing conditions plus any programmed improvements that will be completed by the horizon year(s).

The level of service analysis for signalized and unsignalized intersections will be conducted in accordance with the procedures in the latest edition of the HCM.

Improvement Analysis

The roadways and intersections within the study area will be analyzed with and without the proposed development to identify any projected impacts concerning level of service and safety. The following conditions need to be noted:

- Where the roadway will operate at LOS D or better without the development, the traffic impact of the development on the highway will be mitigated to LOS D.

- Where the highway will operate below LOS D in the horizon year(s) without the development, the traffic impact of the development will be mitigated to provide the same LOS at the horizon year(s).

Roadway improvements will be required if the roadway or intersections will operate at LOS D or better without the improvement, but will operate at LOS D or worse with the improvement. For a limited TIA, the improvement analysis should focus on whether the existing surface type/condition is appropriate for the proposed development.

Traffic Control Needs

The analysis will indicate the appropriate type and location of traffic control such as stop signs or traffic signals. If a traffic signal is proposed the signal must meet traffic signal warrants. Also, if a signal is proposed the analysis will discuss the following:

- location of the signal in relation to intersections and access drives
- traffic signal actuation and phasing
- traffic signal progression, if appropriate

Traffic Safety

The TIA will include a review of roadways and site access for safety including the following considerations:

- Access drives designed to permit vehicles to enter the site without impeding traffic
- The need for auxiliary speed-change lanes
- Adequate storage length for turning vehicles
- Adequate sight distance at intersections and access drives

- Alignment of intersections and driveways opposite the site's access drives where possible
- Analysis of three years of accident data

Improvement Costs

The TIA will include estimated costs of the proposed improvements and will recommend the allocation of these costs among the developer, City, County, State, and other jurisdictions, if appropriate.

Certification

The TIA will be prepared under the supervision of a Professional Engineer (Civil) registered in the State of Arizona. The report must be sealed and signed.