ACCESS MANAGEMENT GUIDELINES

TOWN OF SAHUARITA

May 2004

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EXECUTIVE SUMMARY

Access Management is a process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding system in terms of safety, capacity, and speed. This document provides a policy for access management in the Town of Sahuarita. It is the responsibility of the Town Engineer to administer, coordinate and enforce the provisions and standards in this document.

The lack of a sound access management policy generally results in high crash-rates, increased user delays, excessive emissions and neighborhood cut-through traffic, among others. By adopting this policy, it is the intent of the Town of Sahuarita to provide for the safe and efficient operation of all modes of traffic within the Town roadway system, and to maximize the service life of roadway investments by limiting or delaying the need for costly capital improvements. Specific benefits of effective access management policies are:

- Lower crash rates.
- Reduction of collisions involving pedestrians or bicyclists.
- Improved roadway efficiency
- Better accessibility to developments.
- Elimination of cut-through traffic in residential areas.
- Shorter traffic delays.

The first part of this document introduces the concept of functional classification. The following roadways are classified as principal arterials in Sahuarita: Nogales Highway, Old Nogales Highway, Sahuarita Road and Duval Mine Road. Pima Mine Road and La Cañada Drive are classified as minor arterials.

The following section discusses spacing of access points and their impacts on the operational efficiency and safety performance of the roadway. In general, signalized intersections and full-access median openings should be spaced approximately every 2,640 feet (1/2 mile), but no less than 1,320 feet (1/4 mile). Guidelines for the spacing of unsignalized intersections and other access points are also provided.

The last two sections of the policy present the requirements of the Town for Traffic Impact Analyses (TIA) and dedicated turning lanes. For TIAs the Town has adopted ADOT's policy, which requires a TIA for any development that generates over 100 gross trips during the peak-hour. Turning lanes expedite the movement of through traffic, increase intersection capacity and promote the safety of all traffic. The warrants for turning lanes are based on through volumes, turning volumes and posted speed.

This policy becomes effective immediately. Please refer any suggestions or questions to the Town of Sahuarita Public Works department.

Martin Roush, P.E.
Town Engineer & Public Works Director

5/14/4
Date

1. INTRODUCTION

1.1. PURPOSE

This document provides a policy for access management in the Town of Sahuarita, based on nationally recognized guidelines. A key reference source was the Access Management Manual[1], published by the Transportation Research Board (TRB) in 2003.

The Federal Highway Administration's official definition of access management is "the process that provides access to land development while simultaneously preserving the flow of traffic on the surrounding system in terms of safety, capacity, and speed." The purpose of managing access to roadways is to improve safety, increase the efficiency of traffic operations, and to maximize the benefit-cost ratio of improvements to roadways that are intended to provide high levels of mobility.

1.2. AUTHORITY

It is the responsibility of the Town Engineer to administer, coordinate and enforce the provisions and standards in this document, and to act and decide on all interpretations and requests for modifications.

The Town of Sahuarita understands that, in some cases, strict compliance with this policy may not be feasible. In those cases, the Town Engineer may grant a modification from these standards. The petitioner must be able to show, the satisfaction of the Town Engineer, that the strict application of the provision(s) in question would create an extraordinary and unnecessary hardship, and that the change would not be in conflict with the principles of traffic safety and operational efficiency.

2. FUNCTIONAL CLASSIFICATION

Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the character of service they are intended to provide. The major street functional categories are freeways, arterial, collectors and local streets. Each of these categories have different characteristics in two areas: the amount of mobility they provide and how restrictive or permissive they are in terms of providing access to land, as shown in Exhibit 2-1.

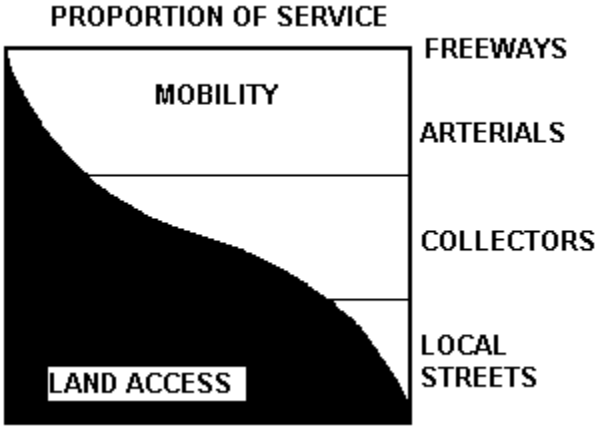


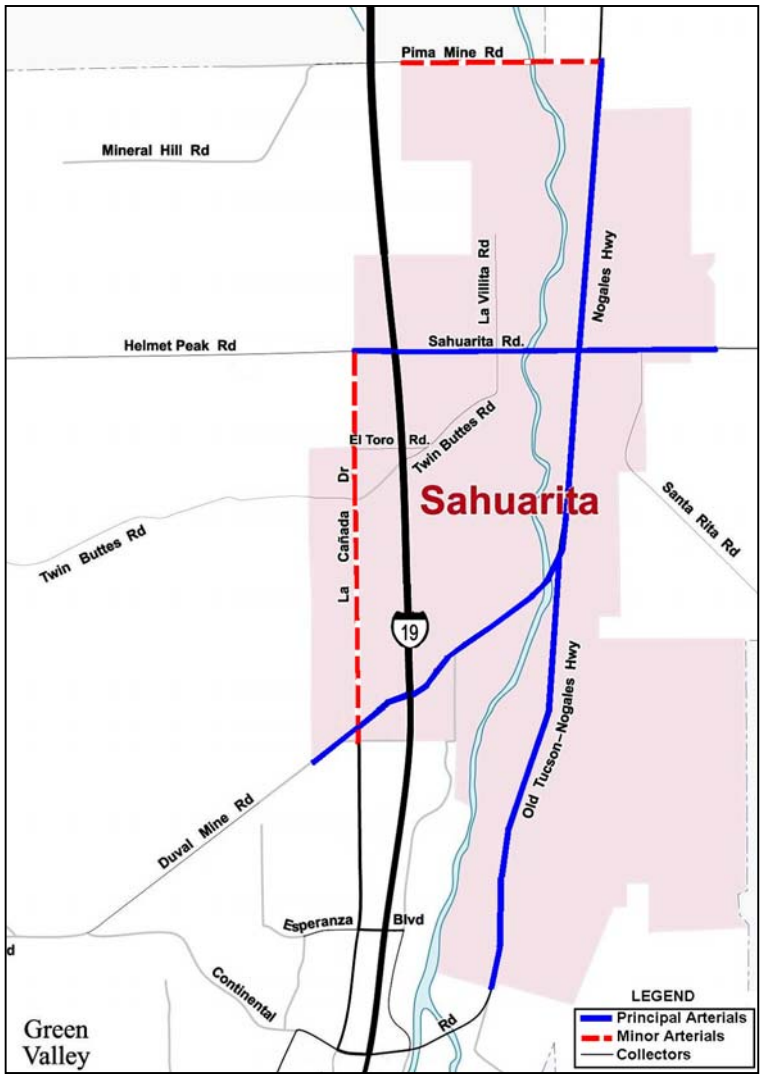
Exhibit 2-1 Access - mobility relationship by functional class[2]

Freeways provide mobility for large traffic volumes at high speeds but have limited access points. Arterial streets also accommodate large traffic volumes but have more points of access than freeways. Collector roadways normally offer a balanced combination of mobility and access, while local roads emphasize the access to land but handle low traffic volumes.

This policy is concerned primarily with Arterial roadways. Arterial roadways are designed for the safe and efficient movement of high volumes of people and goods at a reasonable level of service. Their major function is to provide mobility. Arterials can be further classified as principal arterials and minor arterials. Principal arterials primarily serve regional traffic movements. Minor arterials serve inter and intra-city traffic movements. Exhibit 2-2 presents the arterial roadways in the Town of Sahuarita:

Exhibit 2-2 Arterial roadways in the Town of Sahuarita

Principal Arterials	**Minor Arterials**
Nogales Highway (US 89) Old Nogales Highway Sahuarita Road Duval Mine Road	La Cañada Drive Pima Mine Road



3. OBJECTIVES OF ACCESS MANAGEMENT IN THE TOWN OF SAHUARITA

By implementing this policy, it is the goal of the Town of Sahuarita to provide safe and efficient operation of the arterial roadway network while providing sufficient access to land development within the town. The specific objectives of this policy are to:

1. Provide a Specialized Roadway System – Different types of roadway serve different functions. It is important to design and manage roadways according to the primary function that they are expected to serve.

2. Limit Direct Access to Major Roadways – Arterial roadways that serve high volumes of through traffic need more access control to preserve their traffic function.

3. Promote Intersection Hierarchy – An efficient transportation network provides appropriate transition from one classification to another.

4. Locate Signals to Favor Through Movements – Long, uniform spacing of intersections and signals on major roadways enhances the ability to coordinate signals and ensure continuous movement of traffic at the desired speed.

5. Preserve the Functional Area of Intersections and Interchanges – The functional area of an intersection or interchange is the area that is critical to its operation. Access connections too close to intersections or interchange ramps can cause serious traffic conflicts that impair the function of the affected facilities.

6. Limit the Number of Conflict Points at Driveways and Intersections – Traffic conflicts occur when the paths of vehicles intersect and may involve merging, diverging, weaving, crossing, and stopping. Simplifying the number of traffic conflicts improves traffic operations and results in fewer collisions.

7. Separate Conflict Areas – Intersections and driveways represent conflict areas. Drivers need sufficient time to address one potential set of conflicts before facing another. Separating conflict areas helps to simplify the driving task and contributes to improved vehicle safety.

8. Remove Turning Vehicles From Through Traffic Lanes – Turning lanes allow drivers to decelerate gradually out of the through lane and wait in a protected area for an opportunity to complete a turn, thereby reducing the severity and duration of conflict between turning vehicles and through traffic. They also improve the safety and efficiency of roadway intersections.

9. Non-Traversable Medians to Manage Left-Turn Movements – Medians channel turning movements on major roadways to designated locations.

10. Provide a Supporting Street and Circulation System – Well planned communities provide a supporting network of local and collector streets to accommodate development, as well as unified property access and circulation systems. Interconnected streets and circulation systems provide alternative routes for bicyclists, pedestrians, and drivers alike.

4. ACCESS SPACING

4.1. INTRODUCTION

Access spacing is an important aspect of access management. Spacing standards vary by roadway category, with the higher through traffic category of roadways being more restrictive. Spacing standards should also be established for signalized and unsignalized intersections as well as driveways and median openings. They should apply to new land developments and to significant changes in the nature and size of existing developments.

4.2. SIGNALIZED INTERSECTION SPACING

Closely spaced or irregularly spaced traffic signals on arterial roadways result in frequent stops, unnecessary delays, increased fuel consumption, excessive vehicle emissions, and high crash rates. The desired and minimum spacing for signalized intersections are shown in Exhibit 4-1.

Exhibit 4-1 Spacing for Signalized intersections

Roadway Class	Desirable Spacing (ft)	Minimum Spacing (ft)
Principal Arterial	2,640	1,320
Minor Arterial	2,640	1,320

Spacing arterials at consistent intervals facilitates operations of the major intersections by maximizing traffic flow and minimizing delay. The implementation of traffic signals with inconsistent spacing may significantly impair traffic progression, increasing stops, delay, and rear end crashes. However, sometimes efficiency of signal operation may be outweighed by concerns warranting signal installation, such as specific safety and access considerations.

4.3. UNSIGNALIZED INTERSECTION SPACING

Frequent driveways and lack of separate turn lanes adversely impact traffic operations by creating side friction from turning vehicles, primarily in the outside traffic lane. This friction reduces the capacity of the roadway, since through traffic is slowed and may avoid that lane. Frequent driveways increase weaving and merging activities, which introduces increased potential for vehicular crashes. The desired and minimum spacing for unsignalized intersections and other access points are shown in Exhibit 4-2.

Exhibit 4-2 Spacing for unsignalized intersections and other access points.

	Undivided Roadway		Divided Roadway					
	Unsignalized intersections		Full median opening		Directional median opening		Right In/Out only	
Roadway Class	Desirable Spacing (ft)	Minimum Spacing (ft)	Desirable Spacing (ft)	Minimum Spacing (ft)	Desirable Spacing (ft)	Minimum Spacing (ft)	Desirable Spacing (ft)	Minimum Spacing (ft)
Principal Arterial	1,320	660	2,640	1,320	1,320	660	660	330
Minor Arterial	1,320	330	1,320	660	660	660	660	330

Other criteria for locating access points include[3]:

- Where signalization is imminent or likely, the signal spacing guidelines should govern activity.
- There should be no direct residential lot access to arterial and collector roadways.
- The spacing of right-turn access on each side of a divided roadway can be treated separately. However, where left turns at median breaks are involved, the access on both sides should line up or be offset from the median break by at least 300 feet.
- On undivided roadways, access on both sides of the road should be aligned. Where this is not possible, driveways should be offset by at least 150 to 200 feet when two minor traffic generators are involved, and 300 to 400 feet when two major traffic generators are involved.

5. TRAFFIC IMPACT ANALYSES

In order for the Town of Sahuarita to maintain the roadway network operating as safely and efficiently as possible, it is necessary to evaluate the impact of all development-generated traffic. Such impacts shall be established by following section 240 (Traffic Impact Analysis) of the Traffic Engineering Policies, Guides and Procedures (PGP) of the Arizona Department of Transportation (ADOT)[4]. For applicability to the Town of Sahuarita, the title "Regional Traffic Engineer" shall be replaced by "Town Engineer" throughout the document.

A TIA prepared by a registered Professional Engineer is required for any subdivision or development that generates 100 or more gross trips during the morning or afternoon peak hour of the generator. The size of the study area and the study horizon shall be determined using the criteria presented in Exhibit 5-1. The number of trips generated shall be calculated using the latest edition of *Trip Generation*[5], from the Institute of Transportation Engineers. Section 240 of ADOT's Traffic Engineering PGP is included in the appendix for reference.

Exhibit 5-1 Study area and study horizon for Traffic Impact Analyses

Study Category	Development/Subdivision Characteristics	Study Horizons (a)	Minimum Study Area (b)
I	Small development 100-499 peak hour trips	1. Opening year	1. Site access driveways 2. Adjacent signalized intersections and/or major unsignalized intersections
II a	Moderate development 500-1000 peak hour trips	1. Opening year 2. 5 years after opening	1. Site access drives 2. All arterials, signalized intersections and/or major unsignalized intersections within 1/2 mile
II b	Large, single-phase development >1000 peak hour trips	1. Opening year 2. 5 years after opening 3. 10 years after opening	1. Site access drives 2. All arterials, signalized intersections and/or major unsignalized intersections within 1 mile
II c	Moderate or large, multi-phase development	1. Opening year of each phase 2. 5 years after opening 3. 15 years after opening	1. Site access drives 2. All arterials, signalized intersections and/or major unsignalized intersections within 1 mile

6. TURN LANE WARRANTS

Dedicated turning lanes may be necessary from a safety and/or operational standpoint at locations where speeds or traffic volumes are high, or if there are substantial turning volumes. Turning lanes expedite the movement of through traffic, increase intersection capacity and promote the safety of all traffic. Turn lanes remove the speed differences in the main travel lanes, thereby reducing the frequency and severity of rear-end collisions. They also increase capacity of signalized intersections and may allow more efficient traffic signal phasing. In general, turn lanes should be considered wherever it is reasonable and feasible to do so. A condition where a turn lane may not be applicable is if the addition of a turn lane results in three or more lanes on an approach that is controlled by a stop sign(s) at a major street.

Exhibit 6-1 presents the guideline adopted by the Town of Sahuarita to determine the need for an exclusive left-turn lane. Combinations of volumes and posted speed that fall above the applicable line require a dedicated left-turn lane. Combinations that fall below the applicable line may require a left-turn lane depending upon the circumstances of the site, the variance of the speed and the predictability of the future traffic.

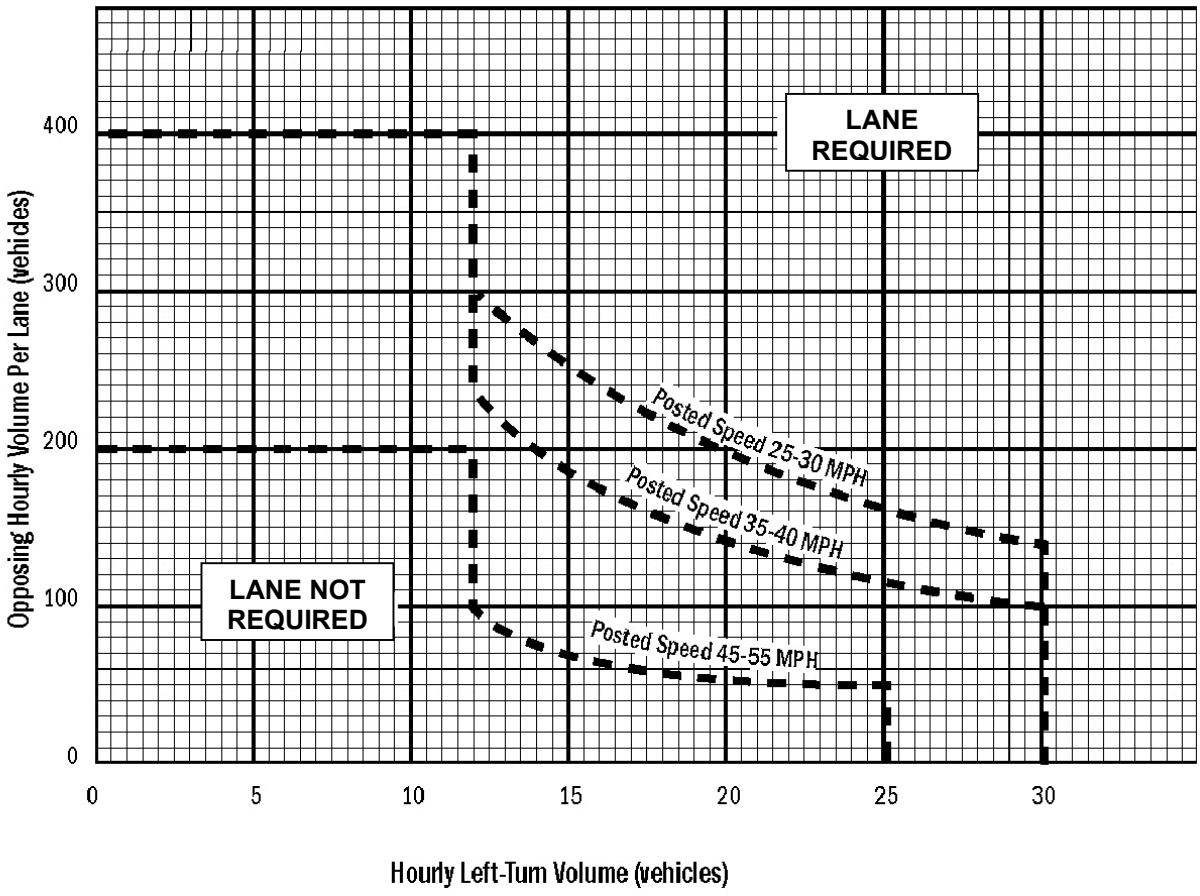


Exhibit 6-1 Left Turn Lane Warrant6

Exhibit 6-2 presents the guideline adopted by the Town of Sahuarita to determine the need for an exclusive right-turn lane. Combinations of volumes and posted speed that fall above the applicable line require a dedicated right-turn lane. Combinations that fall below the applicable

line may require a right-turn lane depending upon the circumstances of the site, the variance of the speed and the predictability of the future traffic.

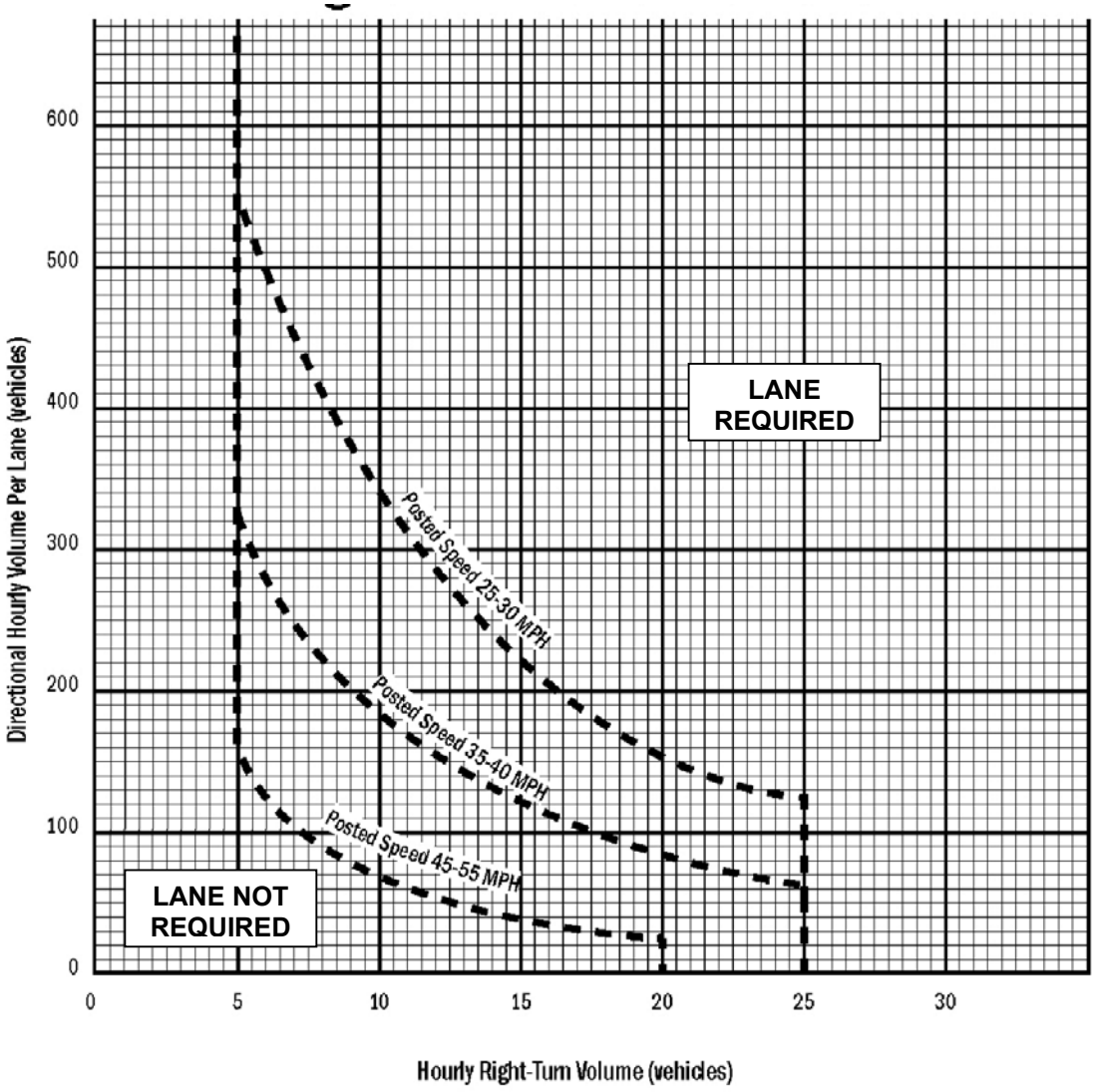


Exhibit 6-2 Right Turn Lane Warrant6

REFERENCES

[1] Access Management Manual. Transportation Research Board, 2003.

[2] A Policy on Geometric Design of Highways and Streets. American Association of State Highway and Transportation Officials, 2001.

[3] Transportation Access Management Guidelines for the City of Tucson, Arizona, 2003.

[4] Traffic Impact Analysis. Traffic Engineering Policies, Guides and Procedures, Arizona Department of Transportation, 2000.

[5] Trip Generation. Institute of Transportation Engineers, 7th edition, 2003.

[6] Access Management Guidelines for Activity Centers. NCHRP Report 348, Transportation Research Board, 1992.

APPENDIX A

ADOT TRAFFIC IMPACT ANALYSIS POLICY

240 TRAFFIC IMPACT ANALYSES

The purpose of this document is to establish uniform guidelines for conducting traffic impact analyses for a proposed new or an expansion of an existing development requesting access, direct or indirect, or modification of access to the State highway system.

A package which includes these guidelines, a Traffic Impact Analysis Study and Report Format Procedural Guidelines, and an Example Traffic Impact Analysis is available from Engineering Records (publication # 35-209).

240.1 IMPLEMENTING STATEMENT

ADOT desires to operate a safe and efficient State highway system. The management of access to the system in an effective manner is vital to maintain the overall safety and efficiency of this system. Access to the State highway system is managed through the encroachment permit process. This permit process requires those desiring access to the State highway system to apply for an encroachment permit. Since access to a State highway for a development may impact traffic on the highway, a Traffic Impact Analysis **shall** be prepared for developments which desire a permit and meet the specific requirement stated below.

The purposes of the Traffic Impact Analysis procedures presented herein are to:

- Provide information to the permit applicant and/or his representatives on specific requirements of the analysis, and

- Ensure consistency in the preparation and review of Traffic Impact Analyses.

The procedures outlined herein present the minimum information required when conducting a Traffic Impact Analysis. The preparer of the Traffic Impact Analysis **shall** contact the appropriate ADOT Regional Traffic Engineer to discuss the scope of the analysis, methodology, and level of detail required for his specific project prior to beginning the analysis.

240.2 REFERENCES

ADOT: Traffic Manual section on Traffic Signal Needs Study
Roadway Engineering Group's "Roadway Design Guidelines", May 1996

Institute of Transportation Engineers:
Draft. Recommended Practice. Traffic Access and Impact Studies for Site Development, September 1989
Manual of Transportation Engineering Studies, 1st Edition, 1994
Trip Generation, 6th Edition, 1997
Transportation and Land Development, 1988

Transportation Research Board, Special Report 209, Third Edition: Highway Capacity Manual, 1994

240.3 DEFINITIONS

Traffic Impact - The effect of site traffic on highway operations and safety.

Traffic Impact Analysis - A traffic engineering study which determines the potential traffic impacts of a proposed traffic generator. A complete analysis includes an estimation of future traffic with and without the proposed generator, analysis of the traffic impacts, and recommended roadway improvements which may be necessary to accommodate the expected traffic.

Traffic Generator - A designated land use (residential, commercial, office, industrial, etc.) or change in land use that generates vehicular and/or pedestrian traffic to and from the site.

Traffic Mitigation - The reduction of traffic impacts on roadways and/or intersections to an acceptable level of service by way of roadway construction improvements, the upgrade of existing traffic control devices, or the modification of the site plan.

Traffic Generation - The estimation of the number of origins from and destinations to a site resulting from the land use activity on that site.

Mode Split - The estimation of the number of trips made by each mode (automobiles, pedestrian, transit, etc.)

Trip Distribution - The allocation of the site-generated traffic among all possible approach and departure routes.

Trip Assignment - The assignment of site plus non-site traffic to specific streets and highways.

Influence Area - The geographic area surrounding the site from which the development is likely to draw a high percentage (80% or more) of the total site traffic.

Area of Significant Traffic Impact - The geographic area which includes the facilities significantly impacted by the site traffic.

Peak Hour - The single hour of a representative day when the traffic volume on the highway represents the most critical period for operation and the highest typical capacity requirements.

Peak Hour of Generator - The single hour of highest volume of traffic entering and exiting a site.

240.4 REQUIREMENT

A traffic impact analysis **shall** be required for all new developments or additions to existing developments which generate 100 or more trips during any one hour of a day. The specific analysis requirements and level of detail are determined by the following categories:

(1) Category I - Developments which generate 100 or more peak hour trips but less than 500 trips during the morning or afternoon peak hour of the highway or during the peak hour of the generator.

A Category I Traffic Impact Analysis may also be required for any of the following reasons:

a. The existence of any current traffic problems or concerns in the local area such as an offset intersection, a high number of traffic accidents, etc., or

b. The sensitivity of the adjacent neighborhoods or other areas where the public may perceive an adverse impact, or

c. The proximity of proposed site driveways to existing driveways or intersections, or

d. Other specific problems or safety concerns that may be aggravated by the proposed development.

(2) Category II - Developments which generate more than 500 trips during the morning or afternoon peak hour of the highway or during the peak hour of the generator.

The Regional Traffic Engineer makes the final decision on requiring a Traffic Impact Analysis and determining whether the Analysis falls within Category I or II. A developer **shall** first estimate the number of vehicle trips generated by the development to determine if a Traffic Impact Analysis is required and the applicable category. The developer **shall** obtain concurrence from the Regional Traffic

Engineer on the number of trips generated by the development. The developer may request that the Regional Traffic Engineer assist him in estimating the number of trips for the purpose of determining whether a Traffic Impact Analysis is required for the proposed development.

If a developer agrees to perform mitigation improvements as outlined by the Regional Traffic Engineer, preparation of a Traffic Impact Analysis may be waived.

240.5 ANALYSIS APPROACH AND METHODS

The following diagrams shall illustrate the roadway network accurately and shall be included in each Traffic Impact Analysis report:

a. Site location
b. Site plan
c. Existing peak hour turning volumes
d. Estimated site traffic generation (a table may be substituted)
e. Directional distribution of site traffic
f. Site traffic assignment (For each horizon year/Build out)
g. Future traffic assignment without development for each horizon year
h. LOS for future traffic without development for each horizon year
i. Total future traffic, i.e. future traffic with development, for each horizon year
j. LOS for total future traffic for each horizon year

The following items should be documented:

a. Existing transportation system
b. Anticipated transportation system
c. Collision diagram(s)
d. Recommended improvements

For Category I, many of the items may be documented within the text. For Category II, the items should be included in figures and/or tables. All figures and tables **shall** be legible.

Additional diagrams may be required to illustrate development construction phases and proposed alternatives when applicable.

When transportation planning models are used to generate present and/or future traffic conditions, it is the responsibility of the submitter to illustrate the diagrams above to provide a clear, step-by-step analysis.

The traffic analysis approach and methods are presented below.

(1) Study Area

The minimum study area **shall** be determined by project type and size in accordance with the criteria in Table 240-1. The extent of the study area may be enlarged or decreased depending on special conditions as determined by the Regional Traffic Engineer.

(2) Study Horizon Years

The study horizon years **shall** be determined by project type and size in accordance with the criteria in Table 240-1.

TABLE 240-1

CRITERIA FOR DETERMINING STUDY REQUIREMENTS

Analysis Category	Development Characteristic (d)	Study Horizons (a)	Minimum Study Area On the State Highway(s) (c)
I	Small Development < 500 peak hour trips	1. Opening year	1. Site access driveways 2. Adjacent signalized intersections and/or major unsignalized street intersections
II a	Moderate, single phase 500 - 1000 peak hour trips	1. Opening year 2. 5 years after opening	1. Site access driveways 2. All State highways, signalized intersections, and/or major unsignalized street intersections within 1/2 mile
II b	Large, single phase > 1000 peak hour trips	1. Opening year 2. 5 years after opening (b) 3. 10 years after opening	1. Site access driveways 2. All State highways, signalized intersections, and/or major unsignalized street intersections within 1 mile
II c	Moderate or large, multi-phase	1. Opening year of each phase	1. Site access driveways

		2. 5 years after opening (b) 3. 15 years after opening	2. All State highways, signalized intersections, and major unsignalized street intersections within 1 mile

(a) Assume full occupancy and build-out.

(b) Not required if the traffic impacts of the project are fully mitigated 10 or 15 years after opening with existing conditions plus 5-year programmed improvements.

(c) An enlarged study area may be required by the Region for certain projects.

(d) The number of trips shall include all trips made to the site, i.e. pass-by and diverted link trips.

(3) Analysis Time Period

Both the morning and afternoon weekday peak hours **shall** be analyzed except:

a. If the proposed project is expected to generate no trips or a very low number of trips during either the morning or evening peak periods, then the requirement to analyze one or both of these periods may be waived by the Regional Traffic Engineer, or

b. Where the peak traffic hour in the study area occurs during a different time period than the normal morning or afternoon peak travel periods (for example midday), or occurs on a weekend, or if the proposed project has unusual peaking characteristics, these additional peak hours **shall** also be analyzed.

The peak hour of generator also shall be analyzed where its value exceeds the number of trips generated by the development during the peak hour of the adjacent highway.

(4) Seasonal Adjustments

The traffic volumes for the analysis hours **shall** be adjusted for the peak season, if appropriate, in cases where seasonal traffic data are available and approved by the Regional Traffic Engineer.

(5) Data Collection Requirements

All data **shall** be collected in accordance with the latest edition of the Institute of Transportation Engineers **"**Manual of Transportation Engineering Studies" or as directed by the Regional Traffic Engineer.

a. Turning Movement Counts

Turning movement counts **shall** be obtained for all existing cross-street intersections to be analyzed during the morning and afternoon peak periods and the peak hour of the generator. Turning movement counts may be required during other periods as directed by the Regional Traffic Engineer.

Available turning movement counts may be extrapolated a maximum of two years with the concurrence of the Regional Traffic Engineer.

b. Daily Traffic Volumes

The current and projected daily traffic volumes **shall** be presented in the report. Available daily count data may be obtained from ADOT and extrapolated a maximum of two years with the concurrence of the Regional Traffic Engineer.

Traffic volume estimates from other approved developments within the study area which are expected to occur during the study horizon years should be obtained from ADOT and presented in the report.

Where daily count data are not available, mechanical counts may be required at the Regional Traffic Engineer's discretion for rural highways where the closest intersection is 1/2 mile or further from the site.

c. Accident Data

Traffic accident data **shall** be obtained from ADOT for the most current three-year period available.

d. Roadway and Intersection Geometrics

Roadway geometric information **shall** be obtained including roadway width, number of lanes, turning lanes, vertical grade, location of nearby driveways, and lane configuration at intersections.

e. Traffic Control Devices

The location and type of traffic controls **shall** be identified.

(6) Trip Generation

a. The latest edition of the Institute of Transportation Engineers' "Trip Generation" **shall** be used for selecting trip generation rates.

b. Other rates may be used with the prior approval of the Regional Traffic Engineer in cases where "Trip Generation" does not include trip rates for a specific land use category, or includes only limited data, or where local trip rates have shown to differ from the "Trip Generation" rates.

(7) Trip Distribution and Assignment

a. Projected trips **shall** be distributed and added to the projected non-site traffic on the State highway(s).

b. The specific assumptions and data sources used in deriving trip distribution and assignment **shall** be documented in the report.

(8) Capacity Analysis

a. Level of service **shall** be computed for signalized and unsignalized intersections in accordance with the latest edition of the "Highway Capacity Manual".

b. For signalized intersections, operational analyses **shall** be performed for time horizons up to five years. The planning method will be acceptable for time horizons beyond five years. Analyses may include modifications to the existing signal timing if the study area is within a coordinated signal system; Highway Capacity Manual signal timing methods should not be used for generating signal timing.

c. Analyses may include an arterial analysis in accordance with the latest edition of the "Highway Capacity Manual".

d. Peak hour factors used for future conditions shall not exceed 0.90. The following peak hour factors shall be used unless otherwise directed by the Regional Traffic Engineer:

PHF = 0.80 for < 75 vph per lane
PHF = 0.85 for 75 - 300 vph per lane
PHF = 0.90 for > 300 vph per lane

(9) Traffic Signal Needs

a. A traffic signal needs study **shall** be conducted for all new proposed signals for the base year. If the warrants are not met for the base year, they should be evaluated for each year in the five-year horizon.

b. Traffic signal needs studies **shall** be conducted per ADOT Traffic Manual section on the Traffic Signal Needs Study.

c. Existing signals adjacent to the development's access to the State highway shall be evaluated for continued signal warrants, phasing, timing, and coordination for each year in the five-year horizon.

(10) Accident Analysis

An analysis of three-years of accident data **shall** be conducted to determine if the level of safety will deteriorate due to the addition of site traffic.

(11) Queuing Analysis (Category II Only)

A queuing analysis **shall** be conducted for all turn lanes and ramp termini under stop or signal control within the study area.

(12) Speed Considerations

Vehicle speed is used to estimate safe stopping and cross corner sight distances. In general, the posted speed limit is representative of the 85th percentile speed on the highway and may be used to estimate safe stopping and cross corner sight distances. However, the 85th percentile speeds for some highways are commonly higher than the posted speed limit. Therefore, a speed of 5 MPH over the posted speed limit or the 85th percentile speed, as directed by the Regional Traffic Engineer, should be used to estimate safe stopping and cross corner sight distances for highways with posted speeds of 55 MPH or greater.

(13) Improvement Analysis

The roadways and intersections within the study area **shall** be analyzed with and without the proposed development to identify any projected impacts in regard to level of service and safety.

a. Where the highway will operate at arterial level of service C or better without the development, the traffic impact of the development on the

highway **shall** be mitigated to arterial level of service C. Mitigation to level of service D may be acceptable in urban areas of over 50,000 population at the discretion of the Regional Traffic Engineer and with the concurrence of the affected municipality.

b. Where the highway will operate below arterial level of service C in the horizon year(s) without the development, the traffic impact of the development **shall** be mitigated to provide the same level of service at the horizon year(s).

(14) Certification

The Traffic Impact Analysis **shall** be prepared under the supervision of a registered Professional Engineer (Civil). For analyses prepared by persons external to ADOT, the report **shall** be sealed and signed.

240.6 STUDY AND REPORT FORMAT

(1) Introduction and Summary

a. Purpose of report and study objectives
b. Executive summary
   - Site location and study area
   - Development description
   - Principal findings
   - Conclusions
   - Recommendations

(2) Proposed Development

a. Site location
b. Land use and intensity
c. Site plan (readable version shall be provided)
   - Access geometrics
d. Development phasing and timing

(3) Study Area Conditions

a. Study area
   - Area of significant traffic impact
   - Influence area

b. Land use
   - Existing land use
   - Anticipated future development

c. Site accessibility
   - Existing and future area roadway system

(4) Analysis of Existing Conditions

a. Physical characteristics
   - Roadway characteristics
   - Traffic control devices
   - Transit service
   - Pedestrian/bicycle facilities
   - Existing transportation demand management

b. Traffic volumes
   - Daily, morning, and afternoon peak periods (two hours), and others as required

c. Level of service
   - Morning peak hour, afternoon peak hour, and other as required

d. Safety

e. Data sources

(5) Projected Traffic

a. Site traffic forecasting (each horizon year)
   - Trip generation
   - Mode split
   - Pass-by traffic (if applicable)
   - Trip distribution
   - Trip assignment

b. Non-site traffic forecasting (each horizon year)
   - Projections of non-site traffic by ADOT may be used. For larger developments and study areas, a more comprehensive method may be required which includes: trip generation, trip distribution, modal split, and trip assignment.

c. Total traffic (each horizon year)

(6) Traffic and Improvement Analysis

a. Site access

b. Level of service analysis
   - Without project including programmed improvements (each horizon year)
   - With project including programmed improvements (each horizon year)
c. Roadway improvements
   - Improvements programmed by ADOT or others to accommodate non-site traffic
   - Additional alternative improvements to accommodate site traffic
d. Traffic safety
   - Sight distance
   - Acceleration/deceleration lanes, left-turn lanes
   - Adequacy of location and design of driveway access
e. Pedestrian considerations
f. Speed considerations
g. Traffic control needs
h. Traffic signal needs (base plus each year in five-year horizon)
i. Transportation demand management

(7) Conclusions

(8) Recommendations

a. Site access
b. Roadway improvements
   - Phasing
c. Transportation demand management actions if appropriate
d. Other

(9) Appendices

a. Traffic counts
b. Capacity analyses worksheets
c. Traffic signal needs studies
d. Accident data and summaries

240.7 APPROVALS

The traffic impact analysis **shall** be submitted to the Regional Traffic Engineer for approval.

The Regional Traffic Engineer or his designated representative **shall** approve or disapprove the Traffic Impact Analysis.

240.8 DESIGN STANDARD REFERENCE

A. Designs **shall** be in accordance with or exceed current ADOT Design, Construction, and Traffic Engineering policies, procedures, and standards.

B. Capacity analyses **shall** be in accordance with the latest edition of the "Highway Capacity Manual".

C. Traffic signal needs studies **shall** be in accordance with the ADOT Traffic Manual section on the Traffic Signal Needs Study.

APPENDIX B

OVERVIEW OF EXISTING ACCESS MANAGEMENT OPTIONS FOR EXISTING ROADWAYS

OVERVIEW OF ACCESS MANAGEMENT OPTIONS FOR EXISTING ROADWAYS

This section provides a brief overview of strategies that can be used to solve existing access management problems.

4.1 DRIVEWAY CONSOLIDATION

Driveways are consolidated in order to limit the number of access points along a roadway and to provide adequate access spacing. An example of this is provided in Exhibit 4-1. Retrofit strategies include:

- Selectively relocate or reconstruct substandard driveways.
- Negotiate driveway closure, reconstruction, or relocation during roadway resurfacing or improvement projects.
- Require improvement of access during redevelopment or expansion of an existing use, including joint and cross access with abutting properties.
- Negotiate redesign of driveway access during sidewalk maintenance, reconstruction, or additions.
- Consolidate access when adjacent properties come under common ownership.
- Improve the traffic signal system through longer, more uniform intervals with advance traffic monitoring and control capabilities.
- Use raised medians or other traffic barriers at hazardous intersections or along certain roadway segments to control mid-block turning movements and improve safety.
- Develop special corridor overlay zoning districts that are tailored to the circumstances of build-up areas.

4.1.1 Joint Use Driveways/Cross-Access

Joint use driveways/cross-access provides for a unified on-site circulation plan serving several properties on a commercial corridor. Cross access connects adjacent parcels and allows for circulation between the parcels without using the arterial street system. In the case that lot frontage is inadequate, joint access/cross access can achieve adequate driveway spacing. The method requires that joint-use driveways and cross access easements need to be established between the adjacent properties. Additionally building sites must reflect the circulation system. The jurisdiction with the zoning authority would need to adopt cross access standards.

4.2 MEDIANS

4.2.1 Raised Medians at Intersections

Raised medians at intersections, as shown in Exhibit 4-2, provide a center barrier to prevent certain turning movements, such as left turn-in only/no left turn-out which allows greater access to the adjacent property and leaves right turns unrestricted. Right-in/right-out driveways

Exhibit 4-1
DRIVEWAY TREATMENTS

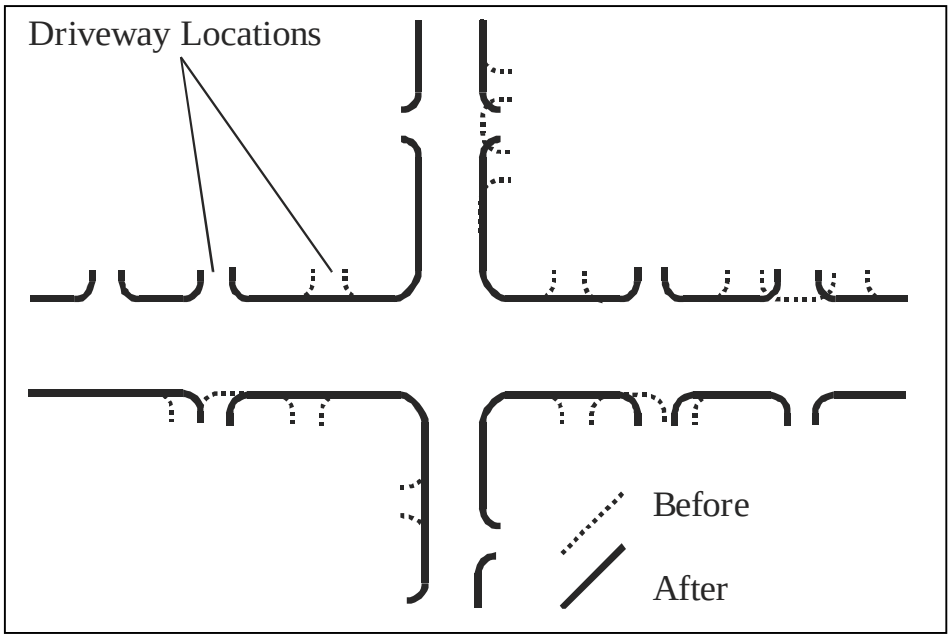
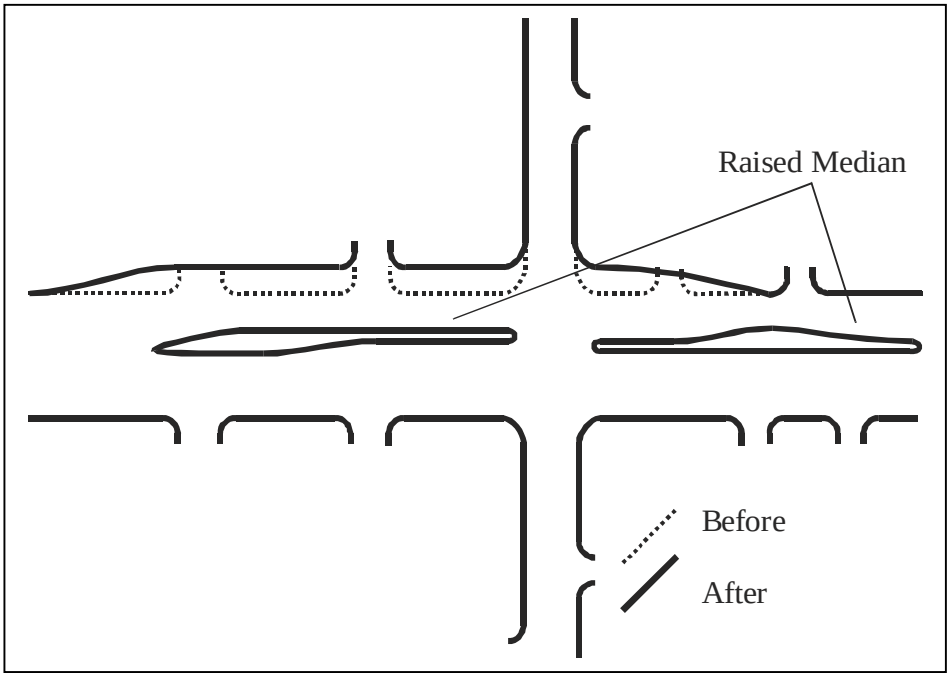


Exhibit 4-2
RAISED MEDIAN AT INTERSECTIONS



are also commonly used. The overall advantage of raised medians at intersections is the ability to define allowed movements while eliminating undesirable ones.

4.2.2 Full Raised Medians

Medians are effective for the control and management of left turns and crossing movements – they may be located at intersection approaches or along the full length of a road between intersections (Exhibit 4-3). A variety of designs allows for full or restricted turning movements. The presence or absence of a median barrier has a substantial effect on the safety and operations of major roadways. The main advantage of a raised median is that it reduces

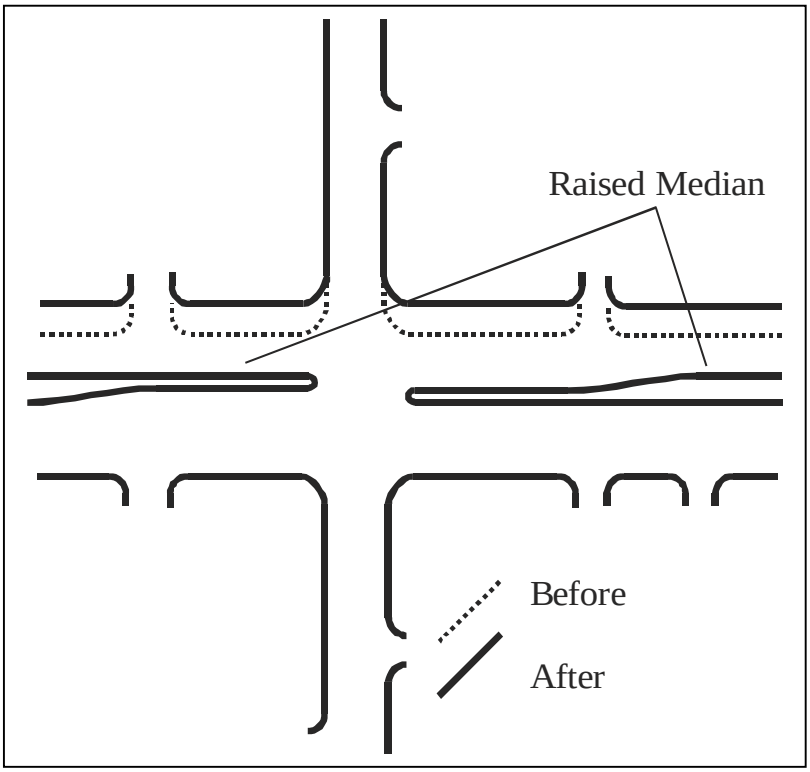
conflict points by restricting turn movements to right-in and right-out movements. In addition it provides a means of controlling highway crossings to specific locations where sight distance and vehicle storage can be provided**.**

A sufficiently wide median can provide shelter for vehicles or pedestrians crossing the roadway. The disadvantage of a raised median is that the number of U-turns will most likely increase at median openings which might lead to an increase in rear-end crashes.

4.3 ALTERNATIVE ACCESS WAYS

A long-term planning objective for major corridors should be to develop a system of side streets, parallel roads, and traffic control features to support existing and planned development. Main components of such a system are frontage or reverse access roads which together with connections between parcels provide alternative routes for short local trips; thereby, helping reduce local traffic on the arterial.

Exhibit 4-3
RAISED MEDIAN TREATMENT

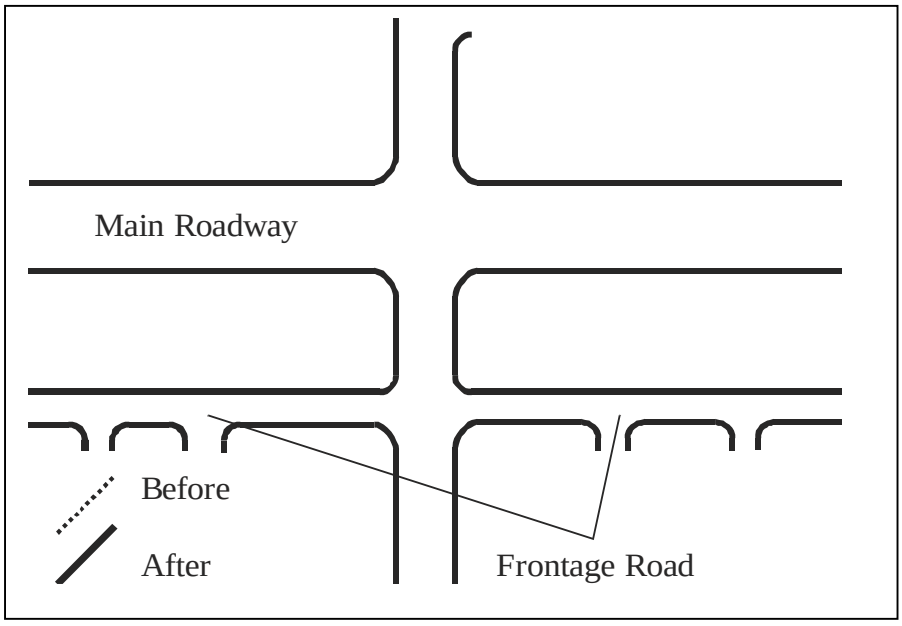


Frontage roads are typically constructed adjacent to the main corridor highway, but out side the highway right-of-way, and funneling local traffic to a common point providing access to the main highway. An example is shown in Exhibit 4-4. Reverse access roads or "backage" roads are also paralleling the highway but are off-set from the right-of-way to provide site access at the back of the property rather than the highway side. Both concepts help to provide access to local properties while preserving the safety and capacity of the highway. One issue to consider is the provision for adequate separation between the highway and the frontage road especially in areas where cross streets intersect with the highway at at-grade intersections. If not properly designed, traffic might backup into the intersection of the frontage road.

Whenever feasible, the parking facilities of adjacent developments should be connected via an internal connection. This will reduce traffic conflicts on the arterial and act to preserve the arterial primary function. Introducing access management techniques into corridors which currently are developed is sometimes difficult and controversial. Unique solutions often need to be used in this reactive process to achieve corridor objectives. Most likely, the consolidation or removal of existing access will be sought in conjunction with roadway reconstruction or urban redevelopment projects.

Access management is easier to preplan as part of a proactive comprehensive planning process which carefully integrates land use and access elements of an adopted sub-area plan. It is primarily on the urban fringes and beyond where it is possible to coordinate transportation system improvements with land development in order to protect the functional integrity of the roadway.

Exhibit 4-4
FRONTAGE ROAD



4.4 RETROFIT STRATEGIES

As mentioned, the application of "retrofit" programs to manage access to an existing roadway is often difficult. The Access Management Guidelines for the City of Tucson identify the following conditions possibly warranting an access management retrofit program:

- **Safety:** Increased congestion and crashes along a given section of road exists which can be attributed to random or inadequate access.
- **Major Reconstruction:** Major reconstruction or design plans make access management and control essential
- **Street expansion:** Improvements make it practical to reorient access to a cross street an remove (or reduce) arterial access;
- **Coordinating Driveways:** Planned new driveways on one side of the street lead to coordination of existing driveways on the other side.

The following Exhibits 4-5 through 4-8 outline retrofit techniques identified in the City of Tucson *Access Management Guidelines*.

Exhibit 4-5
RETROFIT TECHNIQUES
CATEGORY A: LIMIT NUMBER OF CONFLICT POINTS

No.	Description
A-1	Install median barrier with no direct left-turn access.
A-2	Install raised median divider with left-turn deceleration lanes.
A-3	Install one-way operations on the roadway.
A-4	Install traffic signal at high-volume driveways.
A-5	Channelize median openings to prevent left-turn ingress and/or egress maneuvers.
A-6	Widen right through lane to limit right-turn encroachment onto the adjacent lane to the left.
A-7	Install channelizing islands to prevent left-turn deceleration lane vehicles from returning to the through lanes.
A-8	Install physical barrier to prevent uncontrolled access along property frontages.
A-9	Install median channelization to control the merge of left-turn egress vehicles.
A-l0	Offset opposing driveways.
A-11	Locate driveway opposite a three-leg intersection or driveway and install traffic-signals where warranted.
A-12	Install two one-way driveways in lieu of one two-way driveway.
A-13	Install two two-way driveways with limited turns in lieu of one standard two-way driveway.
A-14	Install two one-way driveways in lieu of two two-way driveways.
A-15	Install two two-way driveways with limited turns in lieu of two standard two-way driveways.
A-16	Install driveway channelizing island to prevent left-turn maneuvers.
A-17	Install driveway channelizing island to prevent driveway encroachment conflicts.
A-18	Install channelizing island to prevent right-turn deceleration lane vehicles from returning to the through lanes.
A-19	Install channelizing island to control the merge area of right-turn egress vehicles.
A-20	Regulate the maximum width of driveways.

Source: *Access Management Guidelines for the City of Tucson,* 2002, p.47

Exhibit 4-6
RETROFIT TECHNIQUES
CATEGORY B: SEPARATE BASIC CONFLICT AREAS

No.	Description
B-1*	Regulate minimum spacing of driveways
B-2	Regulate minimum corner clearance
B-3	Regulate minimum property clearance
B-4*	Optimize driveway spacing in the permit authorization stage.
B-5*	Regulate maximum number of driveways per property frontage.
B-6	Consolidate access for adjacent properties.
B-7	Require roadway damages for extra driveways.
B-8	Purchase abutting properties.
B-9	Deny access to small frontage.
B-10	Consolidate existing access whenever separate parcels are assembled under one purpose, plan, entity or usage.
B-11*	Designate the number of driveways regardless of future subdivision of that property.
B-12	Require access on collector street (when available) in lieu of additional driveway on arterial.

* Not directly applicable for retrofit
Source: *Access Management Guidelines for the City of Tucson,* 2002, p.48

Exhibit 4-7
RETROFIT TECHNIQUES
CATEGORY C: LIMIT SPEED-ADJUSTMENT PROBLEMS

No.	Description
C-1	Install traffic signals to slow roadway speeds and meter traffic for larger gaps.
C-2	Restrict parking on the roadway next to driveways to increase driveway turning speeds.
C-3	Install visual cues of the driveway.
C-4	Improve driveway sight distance.
C-5	Regulate minimum sight distance.
C-6*	Optimize sight distance in the permit authorization stage.
C-7	Increase the effective approach width of the driveway (horizontal geometrics).
C-8	Improve the driveway profile (vertical geometrics).
C-9	Require driveway paving.
C-10	Regulate driveway construction (performance bond) and maintenance.
C-11	Install right-turn acceleration lane.
C-12	Install channelizing islands to prevent driveway vehicles from backing onto the arterial.
C-13	Install channelizing islands to move ingress merge point laterally away from the arterial.
C- 14	Move sidewalk-driveway crossing laterally away from the arterial.

* Not directly applicable for retrofit
Source: *Access Management Guidelines for the City of Tucson,* 2002, p.48

Exhibit 4-8
RETROFIT TECHNIQUE
CATEGORY D: REMOVE TURNING VEHICLES FROM THROUGH LANES

No.	Description
D-l	Install two-way left-turn lane.
D-2	Install continuous left-turn lane.
D-3	Install alternating left-turn lane.
D-4	Install isolated median and deceleration lane to shadow and store left-turning vehicles.
D-5	Install left-turn deceleration lane in lieu of right-angle crossover.
D-6	Install median storage for left-turn egress vehicles.
D-7	Increase storage capacity of existing left-turn deceleration lane.
D-8	Increase the turning speed of right-angle median crossovers by increasing the effective approach width.
D-9	Install continuous right-turn lane.
D-10	Construct a local service road.
D-11*	Construct a bypass road.
D-12*	Reroute through traffic.
D-13	Install supplementary one-way right-turn driveways to divided roadway (non-capacity warrant).
D- 14	Install supplementary access on collector streets when available (noncapacity warrant).
D-15	Install additional driveway when total driveway demand exceeds capacity.
D-16	Install right-turn deceleration lanes.
D-17	Install additional exit lane on driveway.
D-18	Encourage connections between adjacent properties (even when each has arterial access).
D-19	Require two-way driveway operation where internal circulation is not available.
D-20	Require adequate internal design and circulation plan.

* = not directly applicable for retrofit
Source: *Access Management Guidelines for the City of Tucson*, 2002, p.49.

APPENDIX C

ACCESS POLICIES FOR ADOT AND LOCAL MUNICIPALITIES

ACCESS POLICIES FOR ADOT AND LOCAL MUNICIPALITIES

OVERVIEW

In 2003 the Arizona State Transportation Board approved a revised set of *Arizona State Transportation Board Policies (Arizona State Transportation Board, August, 2003).* Policy 12 provides the following guidance in respect to access management:

It is the policy of the Board to preserve the functional integrity of the State Highway System through the development and implementation of a comprehensive access management program by:

- Directing ADOT to develop an access management classification system for the State Highways with appropriate access management standards for each access management classification.
- Directing ADOT to develop a comprehensive access management manual to guide the uniform application of access management throughout the state.
- The Board and ADOT shall work closely with regional planning agencies and local governments to encourage early notification to ADOT of zoning and other land use decisions such as large developments and major traffic generators that will impact the State Highway System in order to coordinate system planning.
- Purchasing access rights to highways, where appropriate and feasible.
- Maintaining that the approximate minimum spacing between interchanges on the limited access State and Interstate Highway Systems be three (3) miles in rural areas, two (2) miles in suburban or transitional areas, and one (1) mile in urban areas.
- Considering ramifications to the corridor, and its future use, when access is granted to the State and Interstate Highway Systems.
- Reassessing road segments as demand changes over time.

The policy is supported by several action items strengthening access management in general as well as on a corridor level. In addition, the *Governor's Vision 21 Recommendation (Task Force Final Report to the Governor, December, 2001)* contains the following provisions in regard to access management:

> "*The State should establish strict access control standards on all future roadway development projects. In particular, access along rural community bypasses (and other new routes) should be protected from gradual land use changes that increase local traffic and entering and exiting traffic*."

CITY AND COUNTY AUTHORITY TO REGULATE ACCESS THROUGH PLANNING AND ZONING CONTROLS

Access to roadway facilities can be regulated through the use of planning and regulatory measures including the following: land division, subdivision regulation, and zoning regulations. The authority to implement these tools is given to Counties through ARS 11-802 and ARS 11-806.01 and to Cities through Title 9, Chapter 1, Article 6: Municipal Planning in the *Arizona Revised Statutes* (as amended).

State legislation gives counties and cities the authority to regulate subdivisions. Subdivisions can be regulated in regard to the following access management techniques:

- Control number of access points in relation to road deceleration and acceleration lanes to void conflict points.
- Provide adequate design of driveway throat length to avoid a conflict with the flow of off-site traffic.
- Provide adequate driveway spacing requirements, corner clearance, and joint and cross access configurations.
- Orient lots and access points to local streets and not to the high traffic volume arterials.
- Reverse frontage requirements to ensure that lots abutting the roadway obtain access from a local road.

In addition, counties and cities have police powers similar to the state for roads under their jurisdictions. The *Arizona Revised Statutes* provide the Board of Supervisors with the authority over county roadways in several areas. Under Title 11, Counties, Section 11-251, Powers of Board, Paragraph 4 empowers the Board of Supervisors to "Lay out, maintain, control and manage public roads, ferries and bridges within the county and levy such tax therefore as may be authorized by law." Title 28, Transportation, Section 28-6701, *Establishing, altering or abandoning local highway*, states in Paragraph A that "The board of supervisors may establish, alter or abandon a highway in the county and other legal subdivisions and acquire real property for these purposes by purchase, donation, dedication, condemnation or other lawful means." Thus empowered, the Board of Supervisors, in turn, can then authorize the County Department of Transportation to implement specific policies and procedures with respect to the design, right-of-way acquisition, construction, and maintenance of County roadways. The Board of Supervisors can also implement roadway-related policies directly by resolution.

JURISDICTIONAL RULES, POLICIES, AND ORDINANCES

The various jurisdictions and agencies impacted by the study have to varying degrees guidelines, rules or policies outlining access management procedures. The following section reports on the documents addressing access management.

ARIZONA DEPARTMENT OF TRANSPORTATION

Arizona Administrative Code, Title 17 Transportation, as amended
State of Arizona

ADOT regulates access on state highways, which do not have access-control by administrative rule. *Rule R17-3-712, Encroachments in Highway Rights-Of-Way* guides the granting of encroachment permits. Permits for driveways onto a state highway are granted by ADOT's Engineering Districts in accordance with Rule R17-3-712.

The following are the major points of the rule in regard to access control:

- No access will be granted where access control rights have been legally established unless waived by the State Engineer in accordance with Federal Highway Administration Standards.
- Access to abutting property from within Interstate or other freeway rights-of-way where permitted will be limited to:

– Frontage roads, except the merging entrance and exit ramp areas that will be subject to traffic engineering evaluation.

– Intersecting or nearby public roads and streets within Interstate rights-of-way. At interchanges control for connections to the crossroad is normally affected beyond the ramp terminals by purchasing of access rights. Such control should extend along the crossroads beyond the ramp terminal 100 feet or more in urban areas and 300 feet or more in rural areas subject to traffic engineering evaluation.

- Access from within primary, secondary or other conventional highway rights-of-way will be permitted in accordance with appropriate standards.
- Median openings may be allowed on divided highways except Interstate or other freeways provided they conform to ADOT policy regarding the design and spacing of such openings. This policy will be provided to applicants upon request.
- Permits shall be only for the construction of new turnouts and driveways or changing the location of an existing driveway. They shall not be issued for the purpose of providing a parking area or for servicing of vehicles on highway right-of-way.
- Landowners of adjacent properties may require a joint driveway to serve both properties. Only one of the two adjacent landowners needs to apply for the access permit, but a notarized written mutual agreement—signed by all parties involved—must accompany the application form.

Access Permit Approval Process

The following is the general process for approving permits for access to State highways:

- The property owner requests access.
- Prior to submission of the application for access, the property owner meets with the District Permit Coordinator.
- The property owner submits the application.

- The District reviews the application and related site plans, studies, and other information.
- The District requires a Traffic Impact Analysis (TIA) if needed.
- The District reviews the site plans and TIA if applicable.
- If appropriate, recommendations are made to the property owner concerning access location and design.
- The District approves or rejects the access permit.

Responsibility for Issuing Permits

The ADOT Districts have the responsibility for issuing and enforcing access permits. Currently, there is no central position coordinating the permitting activity of the Districts. The Department of Transportation does not have a separate access management section to administer access management practices.

Arizona Department of Transportation Traffic Engineering Policies, Guidelines, and Procedures
Section 200 - Traffic Studies: 240 Traffic Impact Analysis
January 2000
Arizona Department of Transportation
Phoenix, Arizona

The ADOT Traffic Engineering Section provides the following approach to the statewide and Tucson District's access management, permitting, and traffic impact analysis:

> *"The safe and efficient operation of the State Highway System is a primary goal of the Arizona Department of Transportation. A key element in meeting this goal is the effective management of access to the highway system. Those desiring access to the State highway system from adjacent property shall apply for an encroachment permit. Since access to a State Highway from a development may impact traffic on the highway, a Traffic Impact Analysis shall be required for a development which generates 100 or more trips during any one hour of the day. In some cases, a Traffic Impact Analysis may be required based on considerations other than the traffic generated by the development."*

The traffic impact analysis procedures are guided by *ADOT's Traffic Engineering Policies, Guidelines, and Procedures Section 200 - Traffic Studies: 240 Traffic Impact Analysis (January 2000).* The purpose of this document is to establish uniform guidelines for conducting traffic impact analyses for a proposed new or an expansion of an existing development requesting access, direct or indirect, or modification of access to the State highway system. Exhibit A-1, on the following page, lists the major traffic impact analysis categories and their characteristics.

Exhibit A-1
ADOT'S MAJOR TRAFFIC IMPACT ANALYSIS
CATEGORIES AND THEIR CHARACTERISTICS

Analysis Category	Development Characteristic (d)	Study Horizons (a)	Minimum Study Area On the State Highway(s) (c)
I	Small Development < 500 peak hour trips	1. Opening year	1. Site access driveways 2. Adjacent signalized intersections and/or major unsignalized street intersections
II a	Moderate, single phase 500 - 1000 peak hour trips	1. Opening year 2. 5 years after opening	1. Site access driveways 2. All State highways**,** signalized intersections, and/or major unsignalized street intersections within 1/2 mile
II b	Large, single phase > 1000 peak hour trips	1. Opening year 2. 5 years after opening (b) 3. 10 years after opening	1. Site access driveways 2. All State highways**,** signalized intersections, and/or major unsignalized street intersections within 1 mile
II c	Moderate or large, multi-phase	1. Opening year of each phase 2. 5 years after opening (b) 3. 15 years after opening	1. Site access driveways 2. All State highways**,** signalized intersections, and major unsignalized street intersections within 1 mile

a) Assume full occupancy and build-out
b) Not required if the traffic impacts of the projects are fully mitigated 10 or 15 years after opening with exiting conditions plus 5-year programmed improvements.
c) An enlarged study area may be required by the region for certain projects.
d) The number of trips shall include all trips made to the site, i.e. pass-by and diverted link trips
Source: Arizona Department of Transportation Traffic Engineering Policies, Guidelines, and Procedures, January 2000.

Additional information about the Tucson district permitting procedures, application and forms are provided at http://www.dot.state.az.us/ROADS/tucson/permits.htm the District's Website. The site also contains links to other pertinent ADOT standards.

CITY OF TUCSON

Access Management Guidelines for the City of Tucson, Arizona
Tucson, Arizona
November, 2002

In November 2002 the City of Tucson issued the *Access Management Guidelines for the City of Tucson* defining the overall concept of access management and providing basic policy, planning, and design guidelines. The guidelines were approved as Mayor and

City Council policy in March 2003 and are applicable to all new public and private developments. The guidelines are based on the basic concept that:

> *"…through movement of traffic and direct access to property are in mutual conflict" and congestion and crashes are oftentimes the result of street operations attempting to serve both mobility and access the at the same time."*

The guidelines outline the following main goals of an access management program:

- Limit the number of conflict points at driveway locations
- Separate conflict areas
- Reduce interference of through traffic
- Provide sufficient spacing for at-grade, signalized intersections
- Provide adequate on-site circulation and storage

Based on the functional classification of roadways the guidelines then provide typical access characteristics and spacing standards. Next, the application of medians is discussed and standards provided. Guidance is also given in regard to when grade separations are needed and when to provide pedestrian and crossing devices. Another section of the document provides detailed design standards for street cross sections, sight distance, deceleration and turning lanes, driveways, truck loading areas, median openings, pedestrian, bicycle and transit facilities. The document also provides methods of application including traffic impact analysis, variances, and site design. The methods of application culminate in a series of tables outlining techniques for the implementation of access management under various conditions. Further detail in this report on proposed standards are provided in the section "access management tools and strategies" of this chapter.

<u>City of Tucson, Planning Department, Major Streets and Routes Plan</u>
Ordinance 9340
Tucson, Arizona
January 10, 2000

The City of Tucson's Major Streets and Routes (MS&R) Plan main purpose is to identify street classifications, the width of public rights-of-way, to designate special routes, and to guide land use decisions. The MS&R provides the planning framework for the implementation of improvement plans for arterial and collector streets.

In a first step, roadways are classified by their importance in order to identify those roads which are the main traffic carriers, serve as guide for future street improvements, and determine cost sharing agreements. The MS&R displays for each street the needed right-of-way to accommodate future year traffic. Zoning set-backs are established so that building construction does not occur within the future MS&R right-of-way area. Another element of the MS&R is the designation of scenic and gateway routes.

City of Tucson Land Use Code
Chapter 23, of the *Tucson Code*
Tucson, Arizona
July 1, 1995

The City of Tucson *Land Use Code*, Article II. Zones, Division 8 provides overlay zoning for a variety of City of Tucson *Major Streets and Routes Plan* categories. The Scenic Corridor Zone, for example, is intended to protect the city's unique visual setting and promote its economic well being. The zone extends to any portion of real properties or parcels which are four hundred feet of the future right-of-way line of any Scenic Route on the *Major Streets and Routes Plan* (MS&R). Major provisions include a thirty feet buffer area, structure heights, parking areas, utilities, and design considerations. The MS&R right of-way line locations are established using the future right-of-way width for those streets identified in the MS&R. The land use code defines the usage of the MS&R right-of-way area and specifies temporary usage. The purpose of the gateway corridor zone is to implement the city's policies outlining future arterial and collector streets.

PIMA COUNTY

Pima County Roadway Design Manual
Pima County, Arizona
September, 1998, with October, 2002 Update

The Pima County Roadway Design Manual was revised October of 2002 and is intended to be used as a development guide for new or upgraded major arterials and collector roadways within Pima County. The manual is intended to standardize roadway elements and provides an overall design process. The standards established in the manual are supported by nationally accepted design criteria which are referenced.

The manual does not have a separate section on access management or control, however it provides basic standards in regard to median openings and driveway spacing and location. In regard to median openings and driveways the manual states:

> "*Median openings along Pima County arterials and collectors should be spaced one-quarter mile apart, but generally no closer than 660 feet to other median openings and major intersections. Median openings shall not be allowed within the functional limits of an intersection without prior Pima County Approval"*
>
> *"The location and spacing of driveways that provide access along major arterials and collectors have an impact on both safety and capacity of the roadway. A minimum of 150 feet, measured at the curb line, should separate the nearest pavement edge of any entrance or exit driveway and the curb line of the nearest intersecting street. Driveways near median openings should be centered with the center of the median opening or should be a minimum of 100 feet from the center of the median opening."*

Pima County Code, Chapter 18.69, Subdivision Standards
A Codification of the General Ordinances of the County of Pima, Arizona
Pima County, Arizona
December, 2003

The *Pima County Code, Chapter 18.69, Subdivision Standards* regulate subdivision approval. The street design standards under 18.69.040 addresses the need for a hierarchical street system to provide for through movement on principal streets and the discouragement of through traffic in residential districts. The standards contain provisions for right-of-way preservation, identification of future grade separations, right-of-way width in compliance with county cross-sections. The standards specifically address access to major arterial and collector highways. Major standards include:

- The county engineer shall approve the number and location of intersections of major arterial and collector highways with internal access streets.
- Individual direct access for residential units fronting on the highway shall not be permitted in single detached residential subdivisions
- Multifamily residential subdivisions and commercial and industrial developments shall have no more than two access streets intersecting with a highway.
- Prior to approval of final plats the county engineer shall determine the need for and approve the number and location of: access of an uncurbed highway, curb depressions, median openings, and center two-way left turn lanes.
- Signalized intersections must have a minimum spacing of one-half mile on any major arterial or collector highway;
- The county engineer shall have the authority to designate major high-traffic-volume intersections which have a potential for grade-separated facilities.
- When a frontage road is determined necessary by the county engineer, a major commercial or industrial development fronting on a major arterial shall be required to construct the frontage road contiguous to and generally paralleling the highway, to intercept, collect, and distribute the traffic desiring to cross, enter or leave the highway.
- Other standards address traffic intrusion, alleys, easements and blocks.

Pima County Ordinance No. 1982 – 7: An Ordinance of the Board of Supervisors of Pima County, Arizona Declaring Certain Facilities as Controlled Access Highways
Pima County Code, as amended
Pima County, Arizona
1982

This Pima County ordinance uses the authority vested with the County Board of Supervisors *to layout, maintain, control and manage public* roads, and its mandate to *promote and protect the public health, safety and welfare to* control access on roadway facilities.

ORO VALLEY

Although the Town of Oro Valley does not have formal access management guidelines, planning and engineering staff review proposed developments on a case by case basis. Traffic impact studies for proposed developments are reviewed in regard to access spacing, access design, and alignment of driveways and intersections.

Oro Valley Zoning Code, as amended
Town of Oro Valley
Oro Valley, Arizona

The Town has addressed access management issues on Oracle Road through the adoption of the Oracle Road Scenic Corridor District, an overlay zoning district consistent with the *Oracle Road Scenic Corridor Specific Plan*. Article 10-4 of the *Oro Valley Zoning Code* (as amended) designates regulations for the district including access, density, site development, and landscaping. The following are access regulations for the District:

- **Residential Development**. Direct access to Oracle Road is permitted only for preexisting, residentially-zoned lots of record as of the effective date of the ordinance. After the date of adoption of the ordinance, subdivisions or residential clusters containing a minimum of forty residential lots or dwelling units shall have access points spaced a minimum of 660' on center, except modified by Specific Plan variance. Indirect access to Oracle Road, by way of a dedicated public street or by private street is required as feasible, to any residence or residential development from a point not less than 200' from the Oracle Road right-of-way.
- **Resort Development.** Access to Oracle Road requires a minimum frontage of 660' on Oracle Road, with a single roadway access (unless frontage exceeds 2000' or as may be required for emergency access). The entry drive or street is to be a minimum of 200' in length from the Oracle Road right-of-way to any intersecting interior drive.
- **Commercial Development.** Direct access to Oracle Road is to be spaced a minimum of 330' on center, except as modified by Specific Plan variance.

Another specific access requirement is a spacing of median breaks of not less than 1200 feet for Rancho Vistoso Boulevard.

PINAL COUNTY

Pinal County Zoning Ordinance, as amended
Pinal County, Arizona

Pinal County does not currently have formal access management regulations. Site access is reviewed for projects requiring a rezoning, development plan, or subdivision plot on an ad hoc basis. Building permits for these projects result from the approved site plan, typically with interdepartmental review. For other types of projects (existing zoning,

rezoning-exempt, wildcat subdivisions), access reviews may occur during building permit review or during approval of application for a permit to use County right-of-way. The County does require developers to attend a pre-application meeting with County staff prior to submitting their project for review. This format can be used to address access issues, traffic impact analysis requirements, and other traffic topics.

Pinal County's subdivision regulations and standards for subdivision streets provide limited guidance on access management by establishing (1) platting requirements, (2) right-of-way width, (3) intersection geometrics, and (4) definitions of functional classification of roadways. The zoning code is void of access regulations.