CITY OF LONG BEACH

ARTESIA BOULEVARD SENIOR HOUSING

TRAFFIC IMPACT ANALYSIS

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4439

Table of Contents

APPENDICES

List of Tables

List of Figures

Los Angeles County

Artesia Boulevard Senior Housing

Traffic Impact Analysis

This report contains the traffic impact analysis for the Artesia Boulevard Senior Housing project. The project site is located on the southwest corner of Indiana Avenue and Artesia Boulevard in the City of Long Beach. The project site is proposed to be developed with 60 senior attached housing dwelling units.

The traffic report contains documentation of existing traffic conditions, traffic generated by the project, distribution of the project traffic to roads outside the project, and an analysis of future traffic conditions. Each of these topics is contained in a separate section of the report. The first section is "Findings", and subsequent sections expand upon the findings. In this way, information on any particular aspect of the study can be easily located by the reader.

Although this is a technical report, every effort has been made to write the report clearly and concisely. To assist the reader with those terms unique to transportation engineering, a glossary of terms is provided within Appendix A.

I. Findings

This section summarizes the existing traffic conditions, project traffic impacts, and the proposed mitigation measures.

A. Existing Traffic Conditions

1. The project site is currently a drive-in bank and is generating significant traffic. This analysis has not removed the trip generation associated with this drive-in bank in order to provide for a "conservative" analysis.

2. The study area includes the following intersections:

   Project Access (NS) at:
   Artesia Boulevard (EW) - #1

   Indiana Avenue (NS) at:
   Artesia Boulevard (EW) - #2
   Alley (Project Access) (EW) - #3

3. The study area intersections currently operate at acceptable Levels of Service during the peak hours for Existing traffic conditions, except for the following study area intersection which currently operates at an unacceptable Level of Service during the evening peak hour (see Table 1):

   Indiana Avenue (NS) at:
   Artesia Boulevard (EW) - #2

B. Traffic Impacts

1. The project site is proposed to be developed with 60 senior attached housing dwelling units. The project site will have access to Indiana Avenue and Artesia Boulevard.

2. The proposed development is projected to generate approximately 209 daily vehicle trips, 5 vehicles per hour will occur during the morning peak hour and 7 vehicles per hour will occur during the evening peak hour.

4. The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for Existing Plus Ambient Growth traffic conditions, except for the following study area intersection which is projected

to operate at an unacceptable Level of Service during the evening peak hour (see Table 3):

Indiana Avenue (NS) at:
Artesia Boulevard (EW) - #2

5. The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for Existing Plus Ambient Growth Plus Project traffic conditions, except for the following study area intersection which is projected to operate at an unacceptable Level of Service during the evening peak hour (see Table 4):

   Indiana Avenue (NS) at:
   Artesia Boulevard (EW) - #2

6. The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for Year 2011 without project traffic conditions, except for the following study area intersection which is projected to operate at an unacceptable Level of Service during the evening peak hour (see Table 7):

   Indiana Avenue (NS) at:
   Artesia Boulevard (EW) - #2

7. The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for Year 2011 with project traffic conditions, except for the following study area intersection which is projected to operate at an unacceptable Level of Service during the evening peak hour (see Table 8):

   Indiana Avenue (NS) at:
   Artesia Boulevard (EW) - #2

C. Mitigation Measures

The following measures are recommended to mitigate the impact of the project on traffic circulation:

1. Site-specific circulation and access recommendations are depicted on Figure 33.

2. Construct Indiana Avenue from Artesia Boulevard to the Alley at its ultimate half-section width including landscaping and parkway improvements in conjunction with development.

3. Construct Artesia Boulevard from the west project boundary to Indiana Avenue at its ultimate half-section width as a Major Highway including landscaping and parkway improvements in conjunction with development.

4. The study area intersections are <u>not</u> significantly impacted by the project (see Tables 5 and 9).

5. Sufficient on-site parking shall be provided to meet City of Long Beach parking code requirements.

6. Sight distance at the project accesses should be reviewed with respect to California Department of Transportation/City of Long Beach standards in conjunction with the preparation of final grading, landscaping, and street improvement plans.

7. On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

8. As is the case for any roadway design, the City of Long Beach should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

II. Congestion Management Program Methodology

This section discusses the County Congestion Management Program. The purpose, prescribed methodology, and definition of a significant traffic impact are discussed.

A. County Congestion Management Program

The Congestion Management Program is a result of Proposition 111 which was a statewide initiative approved by the voters in June 1990. The proposition allowed for a nine cent per gallon state gasoline tax increase over a five year period.

Proposition 111 explicitly stated that the new gas tax revenues were to be used to fix existing traffic problems and was not to be used to promote future development. For a city to get its share of the Proposition 111 gas tax, it has to follow certain procedures specified by the State Legislature. The legislation requires that a Traffic Impact Analysis be prepared for new development. The Traffic Impact Analysis is prepared to monitor and fix traffic problems caused by new development.

The Legislature requires that adjacent jurisdictions use a standard methodology for conducting a Traffic Impact Analysis. To assure that adjacent jurisdictions use a standard methodology in preparing Traffic Impact Analyses, one common procedure is that all cities within a county, and the county agency itself, adopt and use one standard methodology for conducting Traffic Impact Analysies.

Although each county has developed standards for preparing Traffic Impact Analyses, Traffic Impact Analysis requirements do vary in detail from one county to another, but not in overall intent or concept. The general approach selected by each county for conducting Traffic Impact Analysies has common elements.

The general approach for conducting a Traffic Impact Analysis is that existing weekday peak hour traffic is counted and the percent of roadway capacity currently used is determined. Then growth in traffic is accounted for and added to existing traffic and the percent of roadway capacity used is again determined. Then the project traffic is added and the percent of roadway capacity used is again determined. If the new project adds traffic to an overcrowded facility, then the new project has to mitigate the traffic impact so that the facility operates at a level that is no worse than before the project traffic was added.

If the project size is below a certain minimum threshold level, then a project does not have to have a Traffic Impact Analysis prepared, once it is shown or agreed that the project is below the minimum threshold. If a project is bigger than the minimum threshold size, then a Traffic Impact Analysis is required.

B. Prescribed Methodology for A Traffic Impact Analysis

The Traffic Impact Analysis must include all monitored intersections to which the project adds traffic above a certain minimum amount. In Los Angeles County, the monitored intersections are contained in Appendix A of the Congestion Management Program for the County of Los Angeles.

In the City of Long Beach, the minimum project added traffic that is needed before an intersection has to be studied is if the project adds 50 two way trips in either the morning or evening weekday peak hour.

If a project adds more traffic than the minimum threshold amount to an intersection, then that intersection has to be analyzed for deficiencies.

If the intersection has to be analyzed for deficiencies, then mitigation is required if the existing traffic plus anticipated traffic growth plus project traffic does cause the Intersection Capacity Utilization to go above a certain point.

In the City of Long Beach, the impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below for signalized intersections:

Significant Impact Threshold for Signalized Intersections		
Level of Service	Volume/Capacity	Incremental Increase
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91 - more	0.01 or more

An intersection mitigation measure shall either fix the deficiency, or reduce the Intersection Capacity Utilization so that it is below the level that occurs without the project.

In the City of Long Beach, the technique used to calculate Intersection Capacity Utilization is as follows. Lane capacity is 1,600 vehicles per lane per hour of green time for through and turn lanes, except that a capacity of 2,880 vehicles per lane per hour of green time is used for dual turn lanes. A total yellow clearance time of 10 percent is added.

In the City of Long Beach, the impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below for unsignalized intersections:

Significant Impact Threshold for Unsignalized Intersections		
Level of Service	Delay	Incremental Increase
E/F	35.01 - more	2.0 or more

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

Project traffic is generated using rates and procedures contained in the Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008. To determine the traffic distribution for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed. The Traffic Impact Analysis has to be prepared by a licensed Traffic Engineer.

This traffic analysis has been prepared in accordance with the Traffic Impact Analysis requirements except as noted. The Traffic Impact Analysis not only examined the Congestion Management Program system of roads and intersections, but also other roads and intersections.

The project generated traffic was added to intersections, and a full intersection analysis was conducted, even when the project added traffic failed to meet the minimum thresholds that require an intersection analysis.

C. Mitigation Measures

If a project is large enough to require that a Traffic Impact Analysis be prepared, and if the project adds traffic to an intersection above a minimum threshold, and if the intersection is operating at above an acceptable level of operation, then the project must mitigate its traffic impact.

Traffic mitigation can be in many forms including adding lanes. Lanes can sometimes be obtained through restriping or elimination of parking, and sometimes require spot roadway widening.

III. Project Description

This section discusses the project's location and proposed development. Figure 1 shows the project location map and Figure 2 illustrates the site plan.

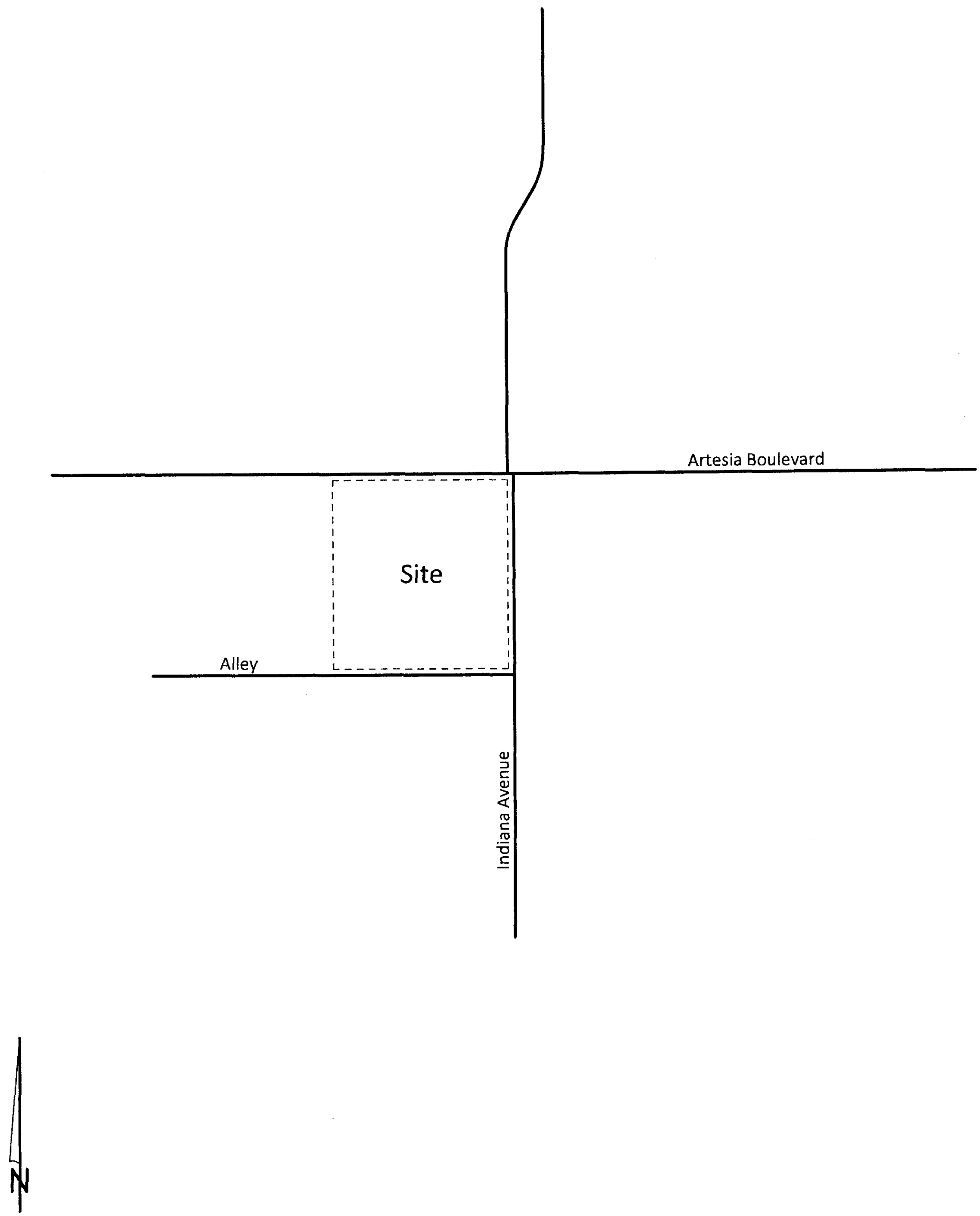
A. Location

The project site is located on the southwest corner of Indiana Avenue and Artesia Boulevard in the City of Long Beach.

B. Proposed Development

The project site is proposed to be developed with 60 senior attached housing dwelling units. The project site will have access to Indiana Avenue and Artesia Boulevard.

Figure 1
Project Location Map



4439/1

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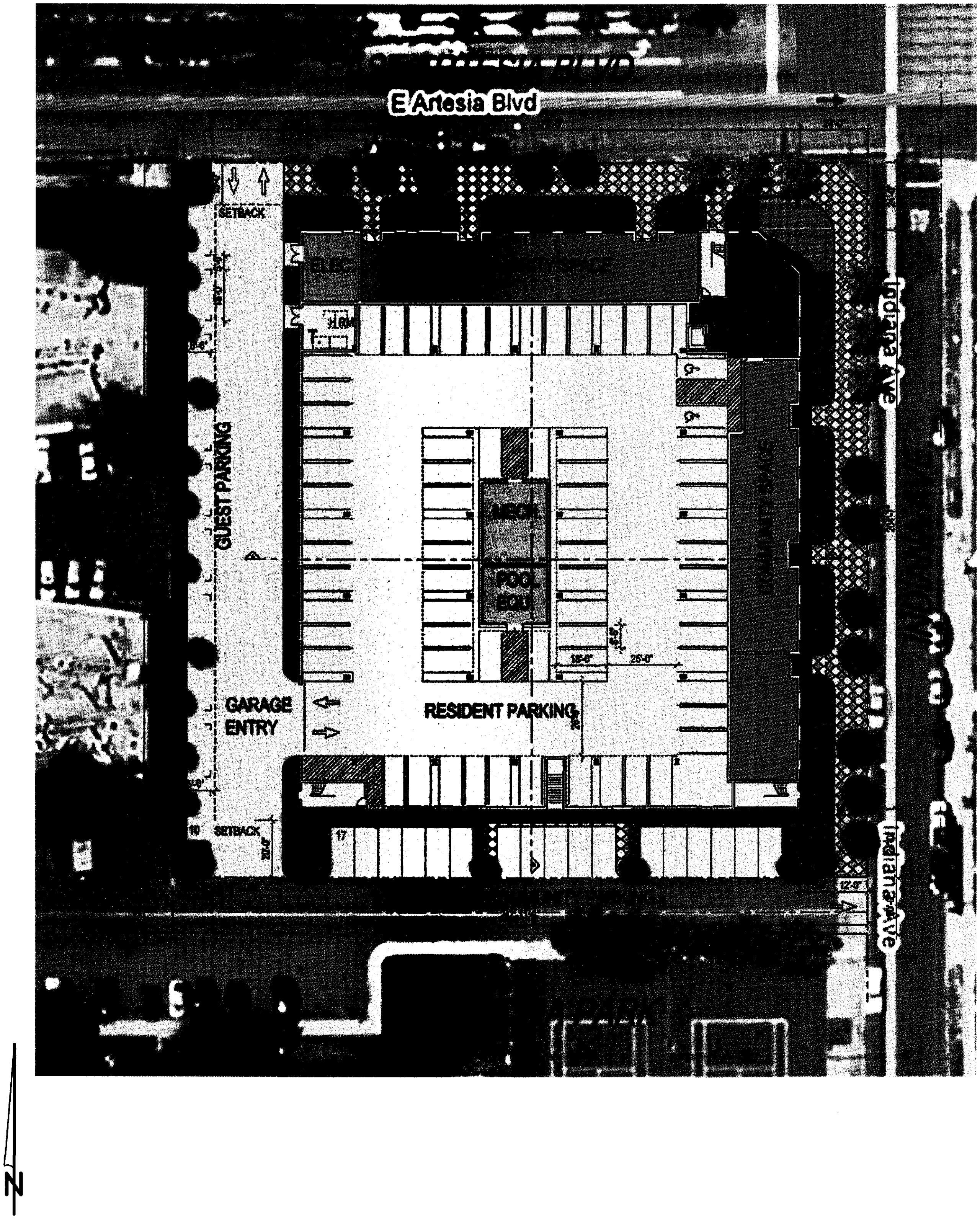
Figure 2
Site Plan



4439/2

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IV. Existing Traffic Conditions

The traffic conditions as they exist today are discussed below and illustrated on Figures 3 to 7.

A. Surrounding Street System

Roadways that will be utilized by the development include Indiana Avenue and Artesia Boulevard.

Indiana Avenue: This north-south roadway currently is two lanes undivided in the study area. Indiana Avenue is currently not classified on the City of Long Beach General Plan Circulation Element. It currently carries approximately 700 to 1,400 vehicles per day in the study area.

Artesia Boulevard: This east-west roadway currently is four lanes divided in the study area. Artesia Boulevard is classified as a Major Highway on the City of Long Beach General Plan Circulation Element. It currently carries approximately 18,000 to 18,300 vehicles per day in the study area.

B. Existing Travel Lanes and Intersection Controls

Figure 3 identifies the existing roadway conditions for study area roadways. The number of through lanes for existing roadways and the existing intersection controls are identified.

C. Existing Average Daily Traffic Volumes

Figure 4 depicts the existing average daily traffic volumes. The existing average daily traffic volumes have been obtained and factored from peak hour counts made for Kunzman Associates using the following formula for each intersection leg:

PM Peak Hour (Approach Volume + Exit Volume) x 10 = Leg Volume.

D. Existing Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix C. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a decimal. The decimal represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

All the study area intersections analyzed in this report are unsignalized intersections. The Intersection Delay Method for unsignalized intersections was calculated using the delay methodology in the 2000 Highway Capacity Manual throughout this traffic impact analysis.

The delay and Level of Service for the existing traffic conditions have been calculated and are shown in Table 1. Existing delay is based upon manual morning and evening peak hour intersection turning movement counts made for Kunzman Associates in May 2009 (see Figures 5 and 6). Traffic count worksheets are provided in Appendix B.

There are two peak hours in a weekday. The morning peak hour is between 7:00 AM and 9:00 AM, and the evening peak hour is between 4:00 PM and 6:00 PM. The actual peak hour within the two hour interval is the four consecutive 15 minute periods with the highest total volume when all movements are added together. Thus, the evening peak hour at one intersection may be 4:45 PM to 5:45 PM if those four consecutive 15 minute periods have the highest combined volume.

The study area intersections currently operate at acceptable Levels of Service during the peak hours for existing traffic conditions, except for the following study area intersection which currently operates at an unacceptable Level of Service during the evening peak hour (see Table 1):

Indiana Avenue (NS) at:
Artesia Boulevard (EW) - #2

Existing Intersection Delay worksheets are provided in Appendix C.

E. Existing General Plan Circulation Element

Figure 7 shows the current City of Long Beach General Plan Circulation Element. Both existing and future roadways are included in the Circulation Element of the General Plan and are graphically depicted on Figure 7. This figure shows the nature and extent of arterial highways that are needed to adequately serve the ultimate development depicted by the land use element of the General Plan.

F. Transit Service

Transit service is currently not provided in the study area by Long Beach Transit.

Table 1

Existing Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Indiana Avenue (NS) at:															
Artesia Boulevard (EW) - #2	CSS	0	1	0	0	1	0	1	2	1	1	2	1	17.3-C	43.9-E
Alley (Project Access) (EW) - #3	CSS	0	1	0	0	1	0	0	1	0	0	0	0	8.7-A	9.1-A

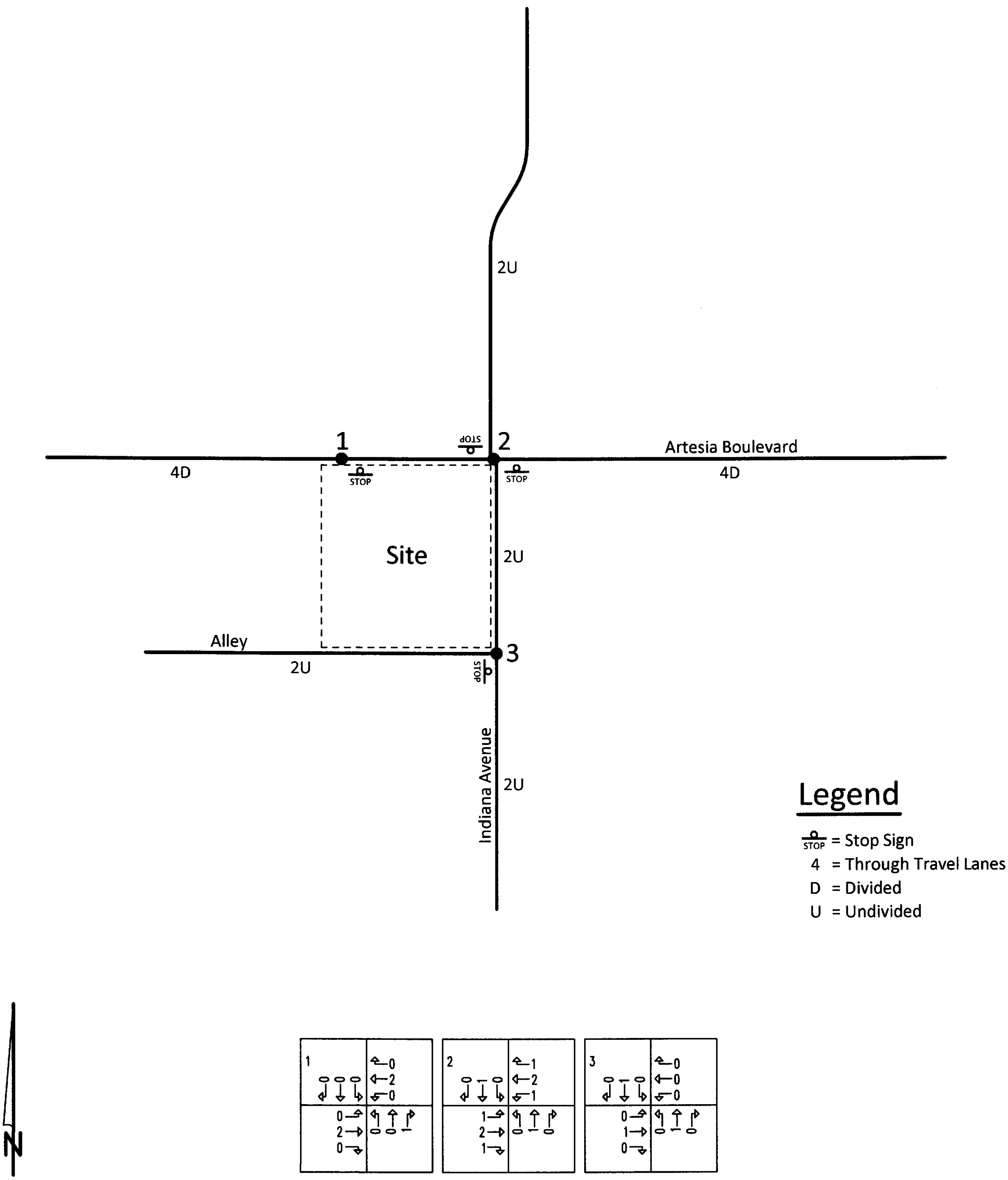
[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the 2000 Highway Capacity Manual. Overall average intersection delay and level of service are shown for intersections with all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] CSS = Cross Street Stop

Figure 3
Existing Through Travel Lanes and Intersection Controls



4439/3

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

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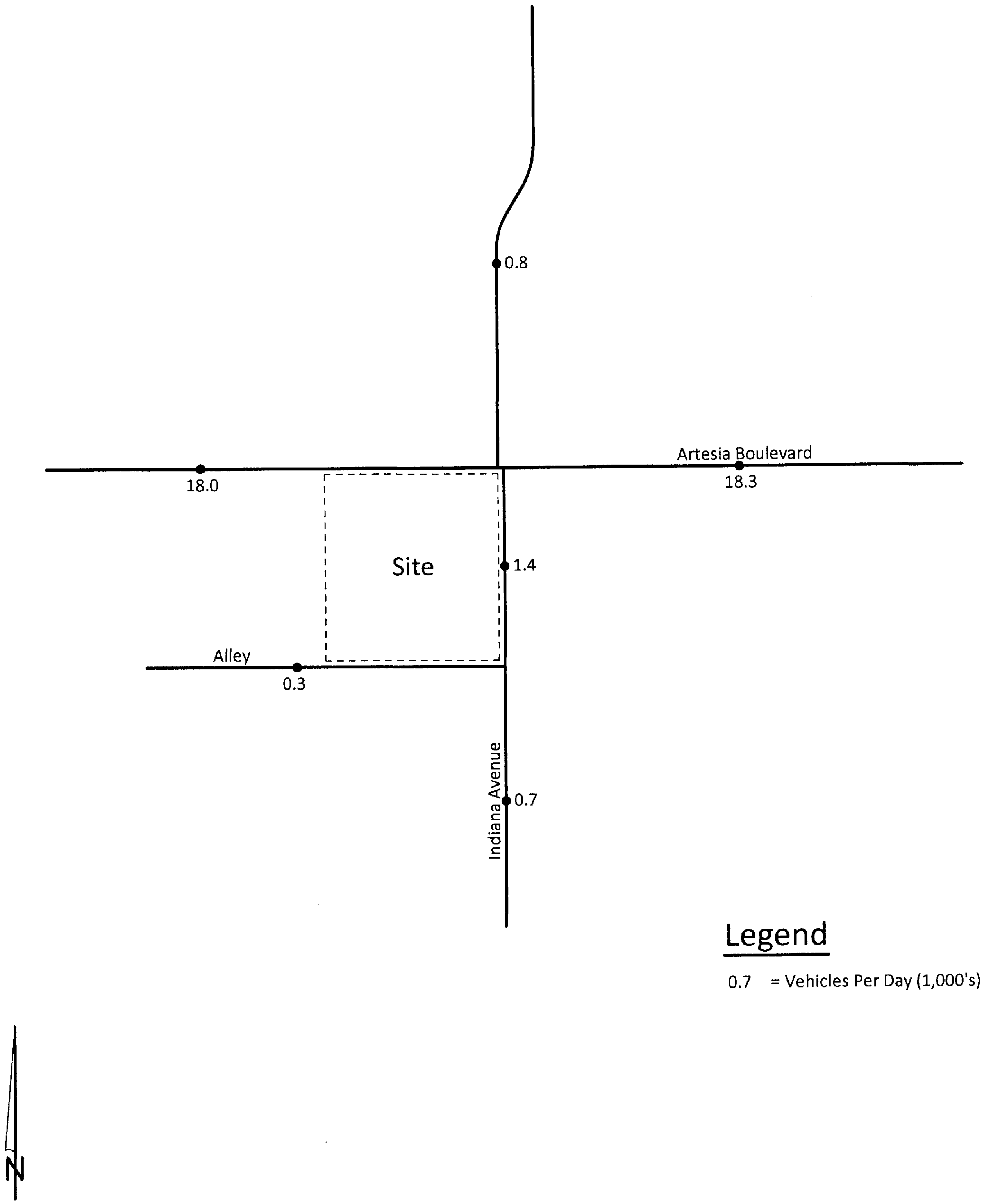
Figure 4
Existing Average Daily Traffic Volumes



4439/4

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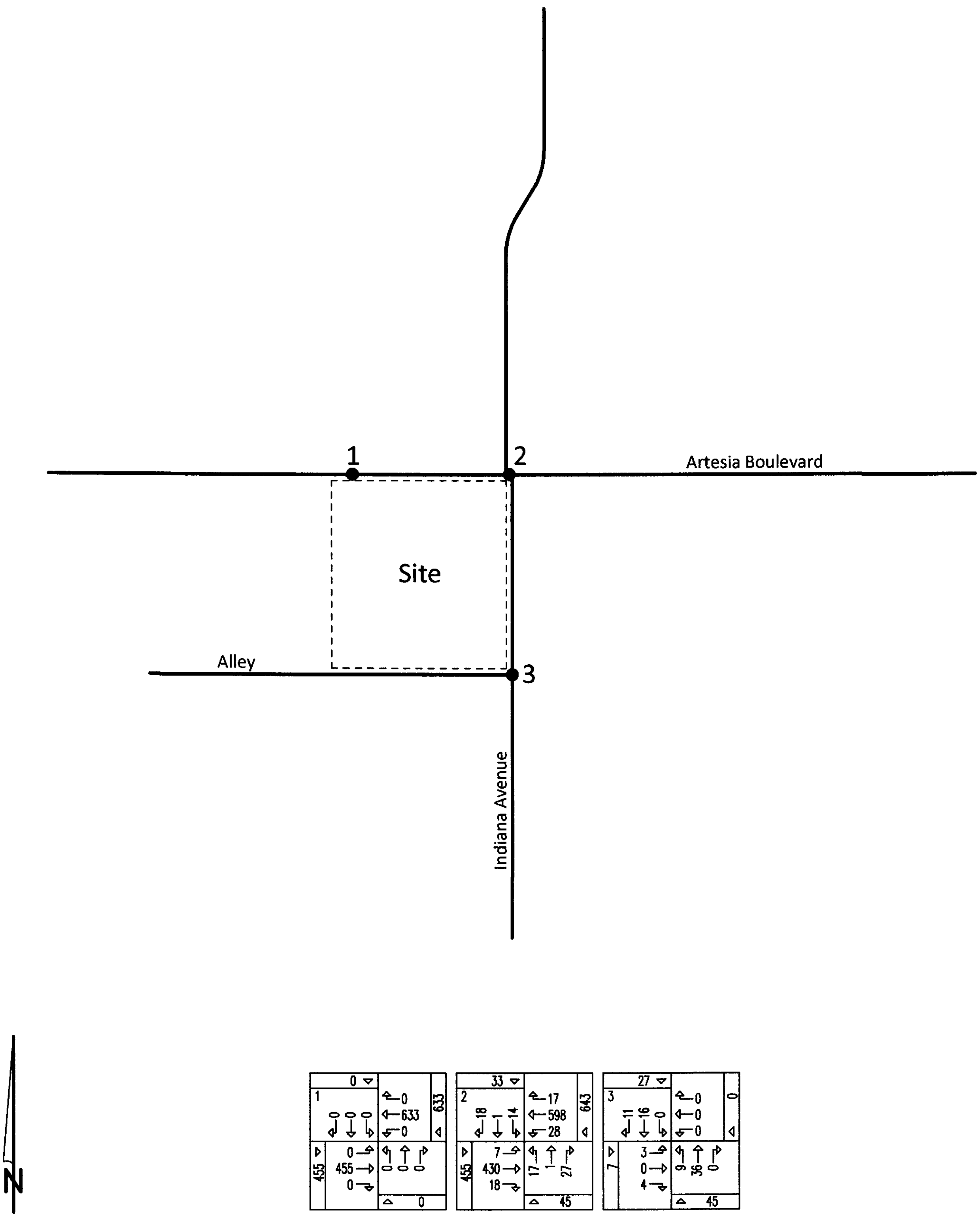
Figure 5
Existing Morning Peak Hour Intersection Turning Movement Volumes



Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

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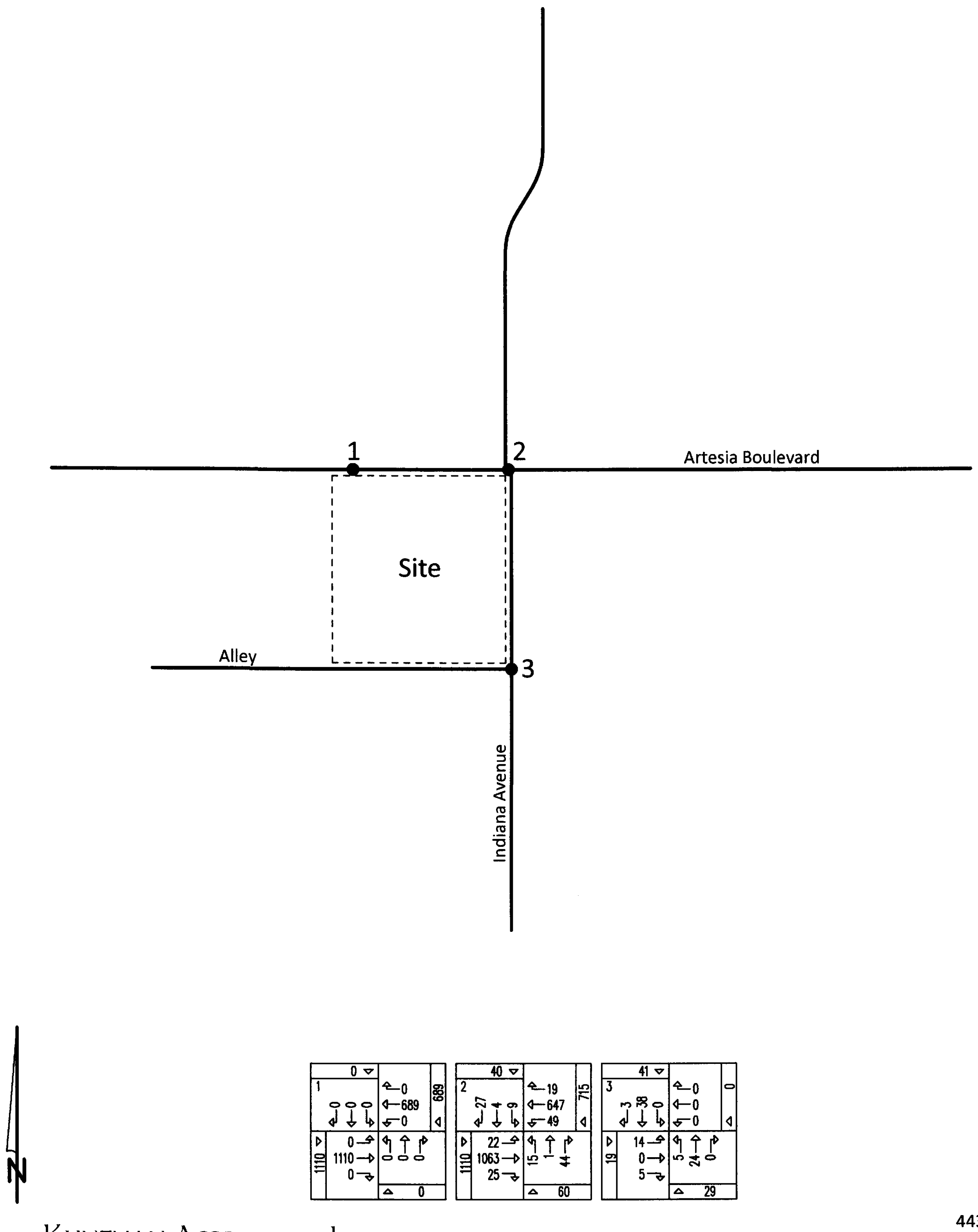
Figure 6
Existing Evening Peak Hour Intersection Turning Movement Volumes



KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

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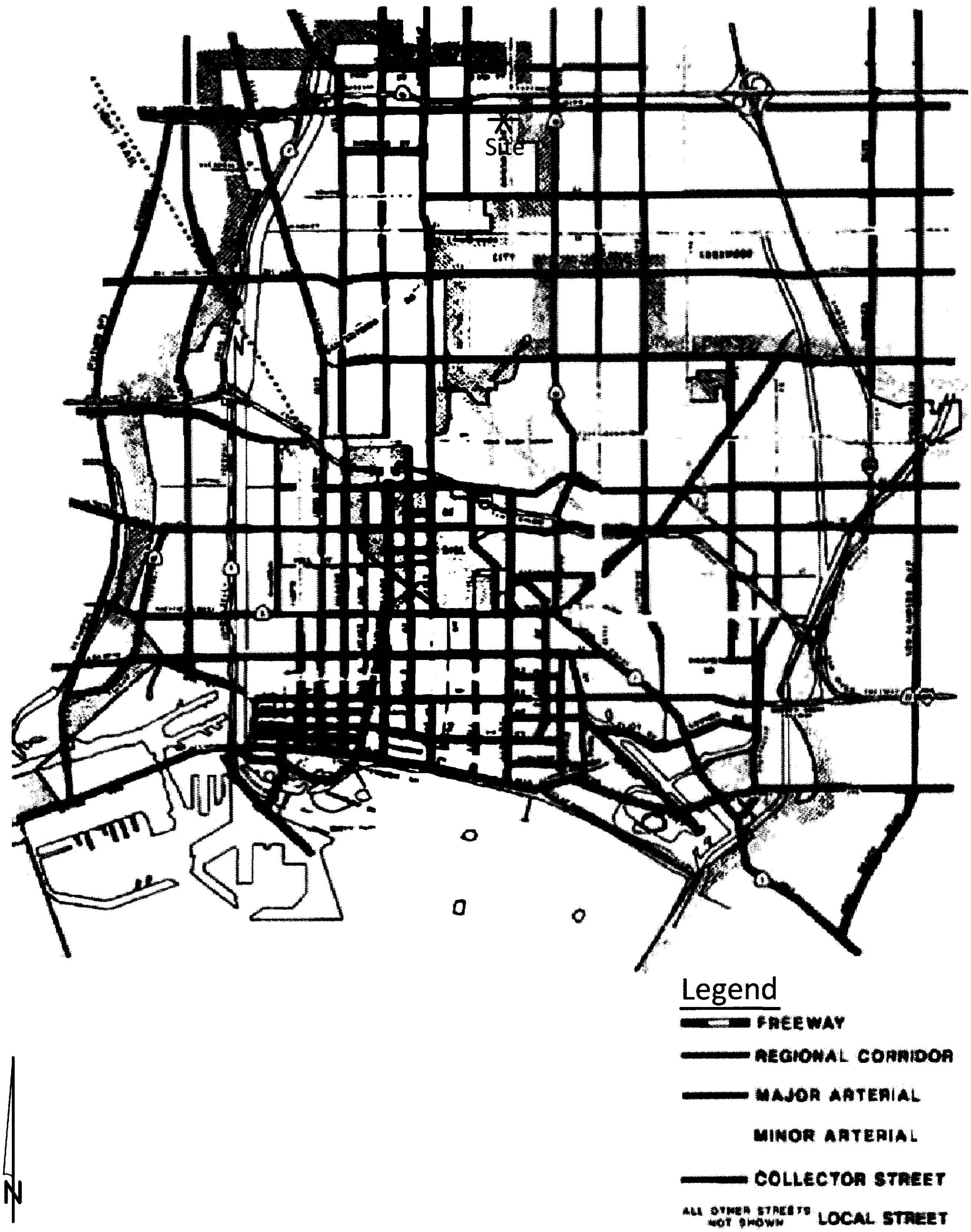
Figure 7
City of Long Beach General Plan Circulation Element



4439/7

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Source: City of Long Beach

V. Project Traffic

The project site is proposed to be developed with 60 senior attached housing dwelling units. The project site will have access to Indiana Avenue and Artesia Boulevard.

A. Trip Generation

The traffic generated by the project is determined by multiplying an appropriate trip generation rate by the quantity of land use. Trip generation rates are predicated on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and our life styles remain similar to what we know today. A major change in these variables may affect trip generation rates.

Trip generation rates were determined for daily traffic, morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the proposed land use. By multiplying the traffic generation rates by the land use quantity, the traffic volumes are determined. Table 2 exhibits the traffic generation rates, project peak hour volumes, and project daily traffic volumes for the project site. The traffic generation rates are from the Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008.

The proposed development is projected to generate approximately 209 daily vehicle trips, 5 vehicles per hour will occur during the morning peak hour and 7 vehicles per hour will occur during the evening peak hour.

B. Trip Distribution

Figures 8 and 9 contain the directional distributions of the project traffic for the proposed land use.

To determine the traffic distributions for the proposed project, peak hour traffic counts of the existing directional distribution of traffic for existing areas in the vicinity of the site, and other additional information on future development and traffic impacts in the area were reviewed.

C. Trip Assignment

Based on the identified traffic generation and distributions, project average daily traffic volumes have been calculated and shown on Figure 10. Morning and evening peak hour intersection turning movement volumes expected from the project are shown on Figures 11 and 12, respectively.

D. Modal Split

The traffic reducing potential of public transit has not been considered in this report. Essentially the traffic projections are conservative in that public transit might be able to reduce the traffic volumes.

Table 2

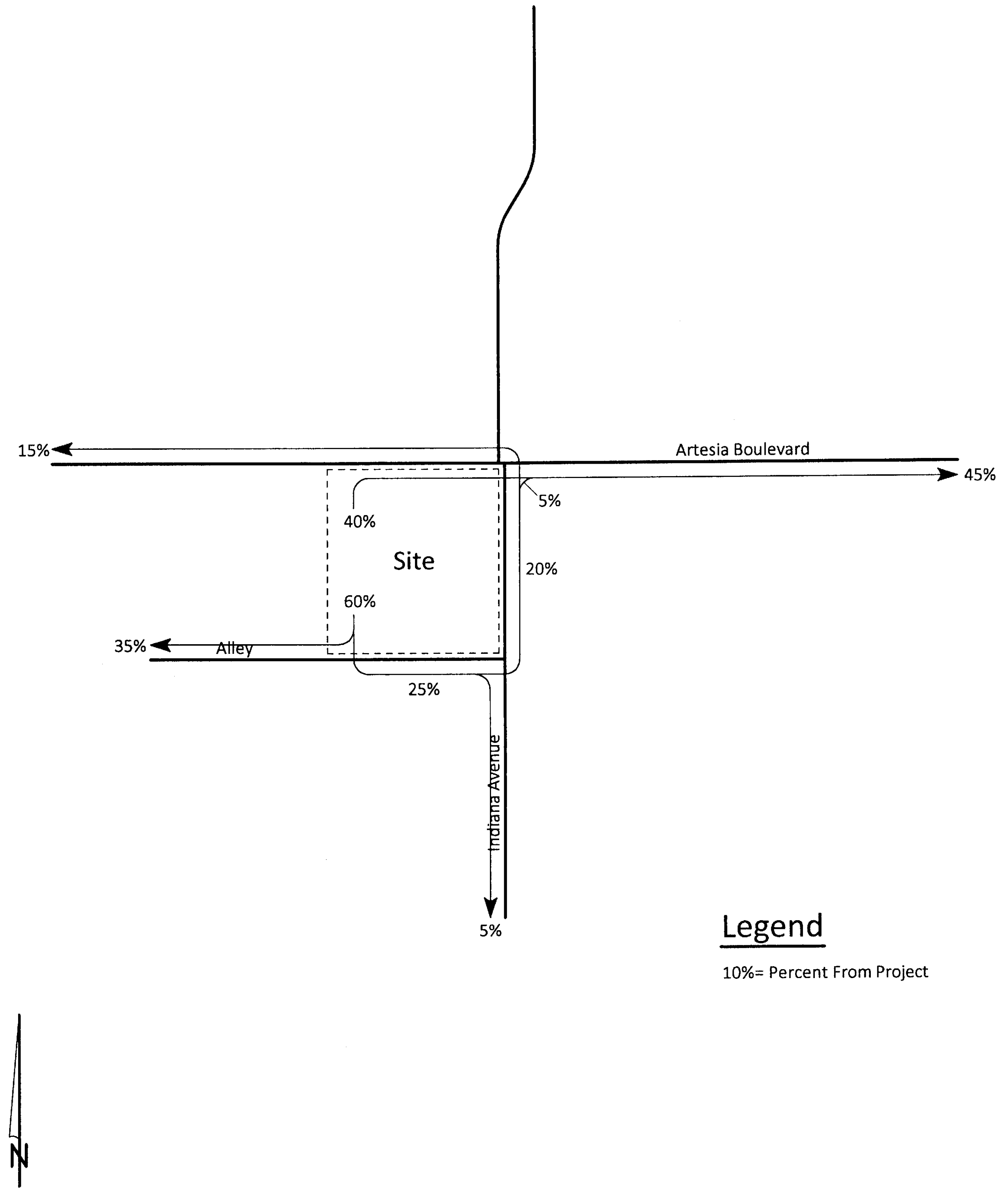
Project Traffic Generation[1]

Land Use	Quantity	Units[2]	Peak Hour						Daily
			Morning			Evening			
			Inbound	Outbound	Total	Inbound	Outbound	Total	
Trip Generation Rates									
Senior Attached Housing	60	DU	0.04	0.04	0.08	0.07	0.04	0.11	3.48
Trips Generated									
Senior Attached Housing	60	DU	2	3	5	4	3	7	209

[1] Source: Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008, Land Use Category 252.

[2] DU = Dwelling Units

Figure 8
Project Outbound Traffic Distribution



4439/8

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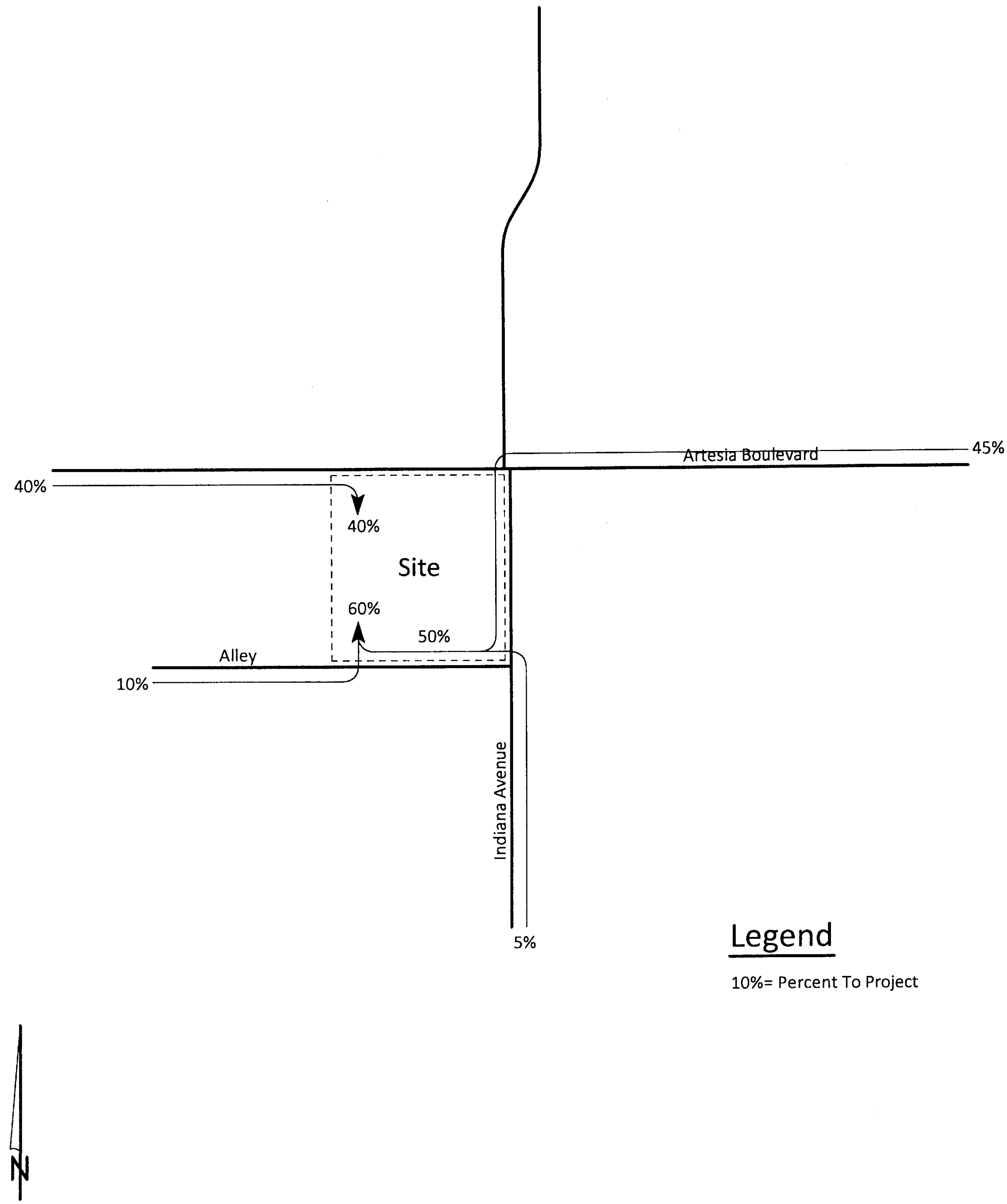
Figure 9
Project Inbound Traffic Distribution



4439/9

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Figure 10
Project Average Daily Traffic Volumes

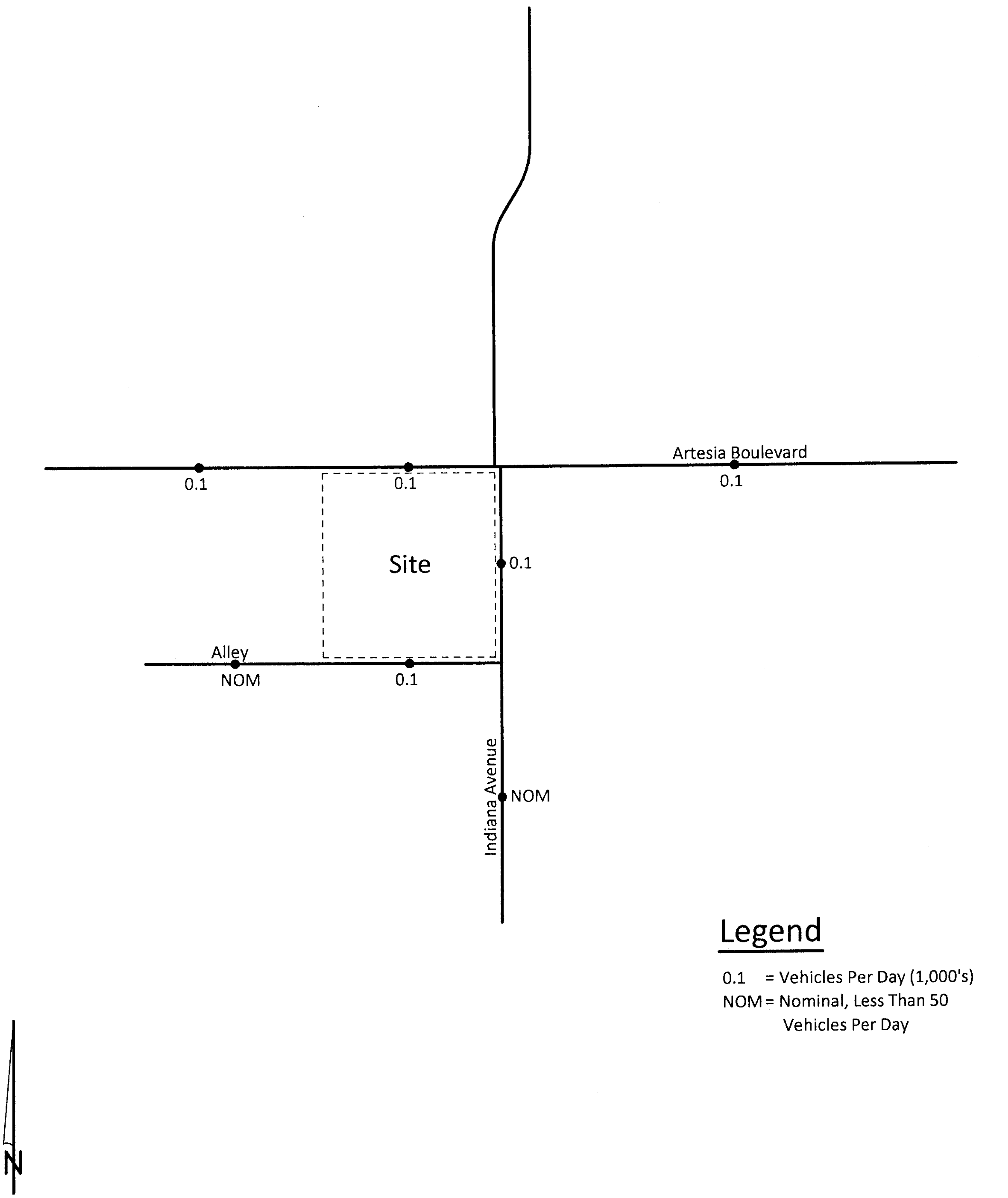

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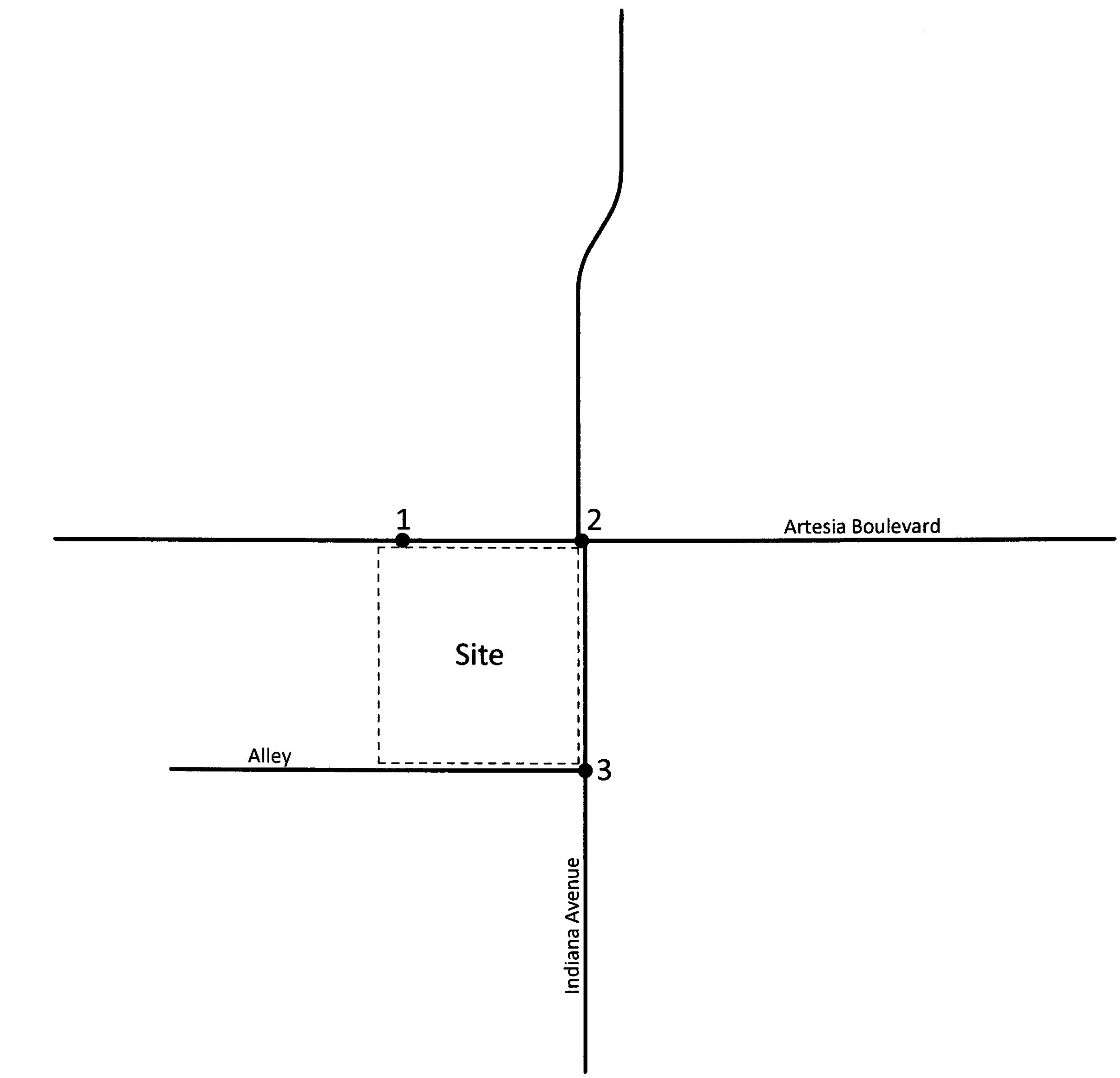
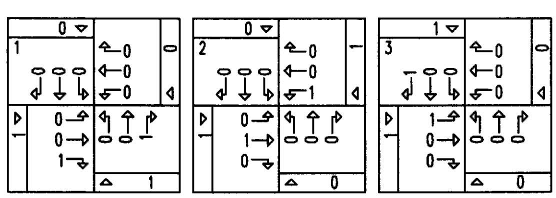
Figure 11
Project Morning Peak Hour Intersection Turning Movement Volumes





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KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

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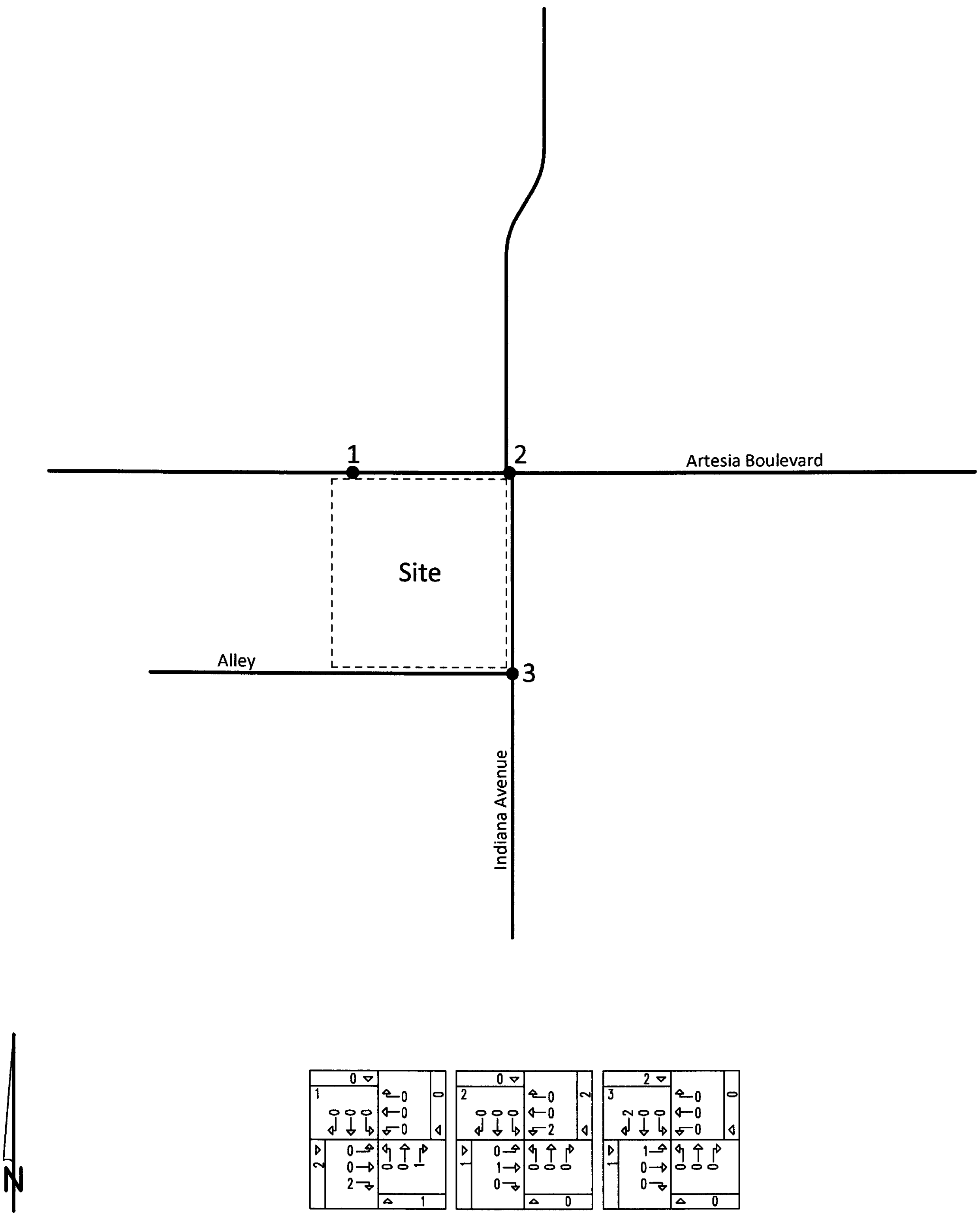
Figure 12
Project Evening Peak Hour Intersection Turning Movement Volumes



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VI. Existing Plus Ambient Growth Traffic Conditions

In this section, Existing Plus Ambient Growth traffic conditions are discussed. Figures 13 to 15 depict the Existing Plus Ambient Growth traffic conditions.

A. Method of Projection

For Existing Plus Ambient Growth traffic conditions, an areawide growth rate has been utilized to account for areawide growth on study area roadways. Existing Plus Ambient Growth traffic volumes have been calculated based on a 1.0 percent annual growth rate of existing traffic volumes over a two (2) year period. The areawide growth rate has been obtained from the City of Long Beach Department of Transportation.

Areawide growth has been added to daily and peak hour traffic volumes on surrounding roadways.

B. Existing Plus Ambient Growth Average Daily Traffic Volumes

Existing Plus Ambient Growth average daily traffic volumes are as illustrated on Figure 13.

C. Existing Plus Ambient Growth Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix C. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a decimal. The decimal represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

All the study area intersections analyzed in this report are unsignalized intersections. The Intersection Delay Method for unsignalized intersections was calculated using the delay methodology in the 2000 Highway Capacity Manual throughout this traffic impact analysis.

The delay and Level of Service for the Existing Plus Ambient Growth traffic conditions have been calculated and are shown in Table 3. Existing Plus Ambient Growth morning and evening peak hour intersection turning movement volumes are shown on Figures 14 and 15, respectively.

The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for Existing Plus Ambient Growth traffic conditions, except for the following study area intersection that is projected to operate at an unacceptable Level of Service during the evening peak hour (see Table 3):

Indiana Avenue (NS) at:
Artesia Boulevard (EW) - #2

Existing Plus Ambient Growth Intersection Delay worksheets are provided in Appendix C.

Table 3

Existing Plus Ambient Growth
Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Indiana Avenue (NS) at:															
Artesia Boulevard (EW) - #2	CSS	0	1	0	0	1	0	1	2	1	1	2	1	17.8-C	48.5-E
Alley (Project Access) (EW) - #3	CSS	0	1	0	0	1	0	0	1	0	0	0	0	8.7-A	9.2-A

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the 2000 Highway Capacity Manual. Overall average intersection delay and level of service are shown for intersections with all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] CSS = Cross Street Stop

Figure 13
Existing Plus Ambient Growth Average Daily Traffic Volumes

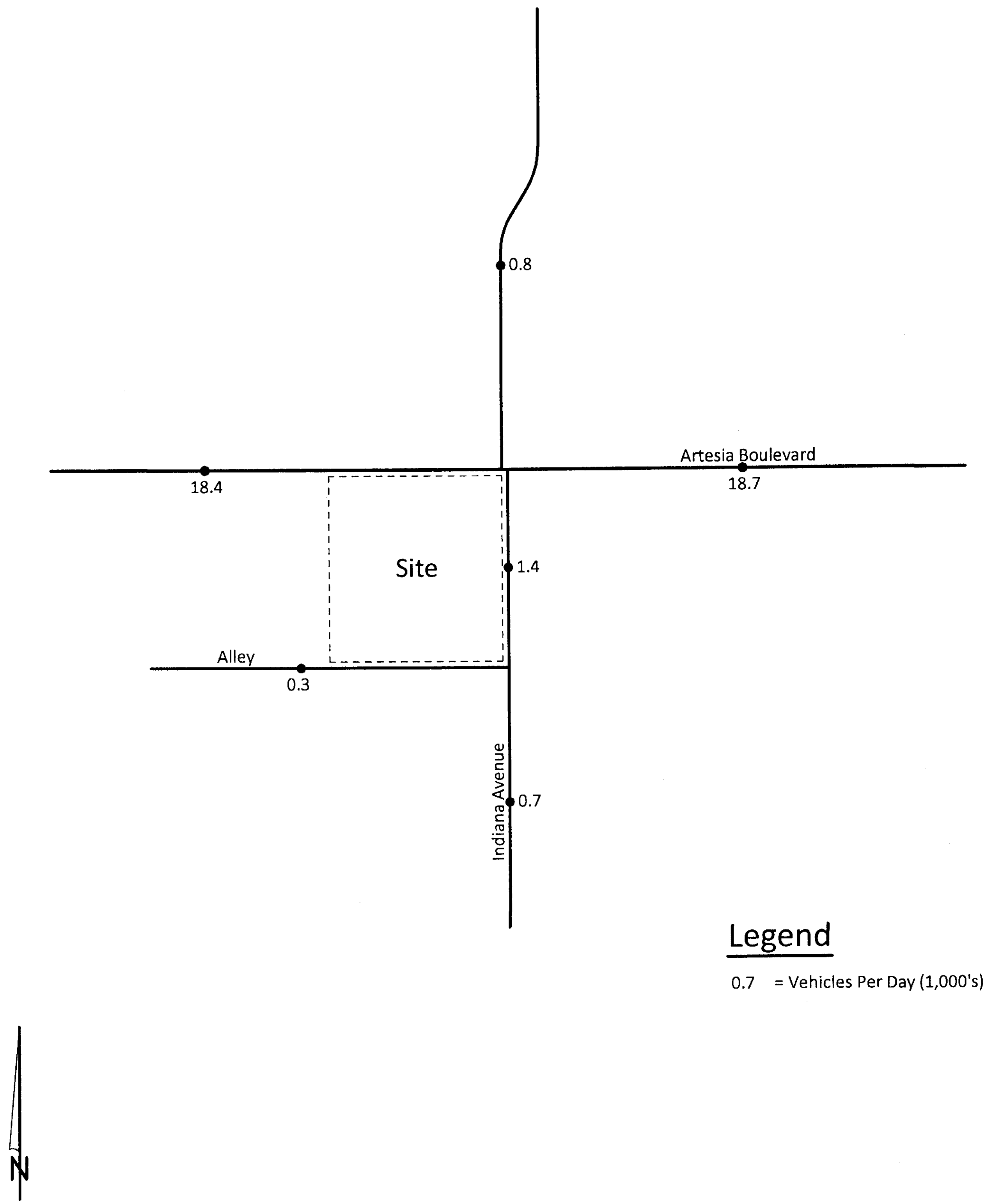

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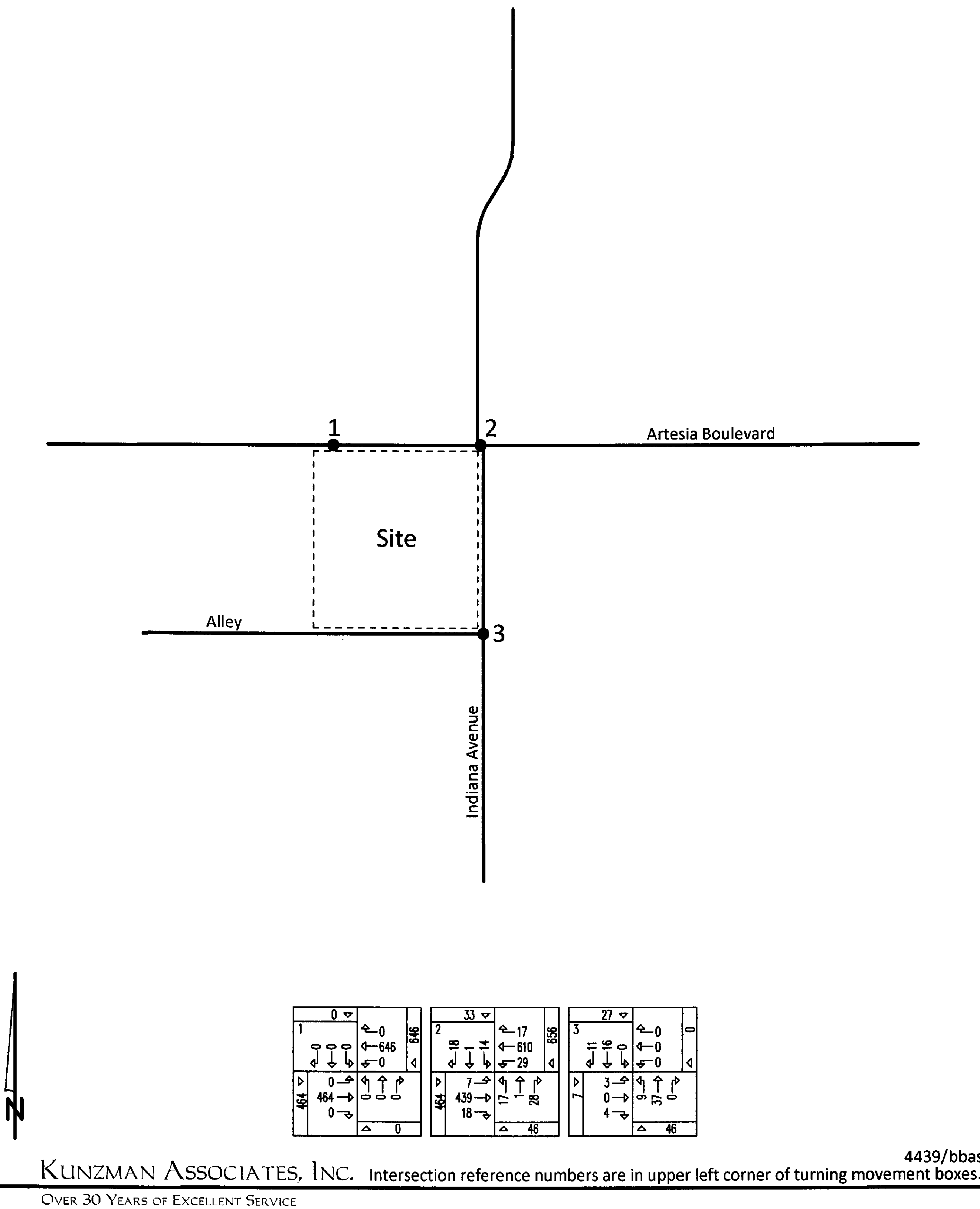
Figure 14
Existing Plus Ambient Growth
Morning Peak Hour Intersection Turning Movement Volumes



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Intersection reference numbers are in upper left corner of turning movement boxes.

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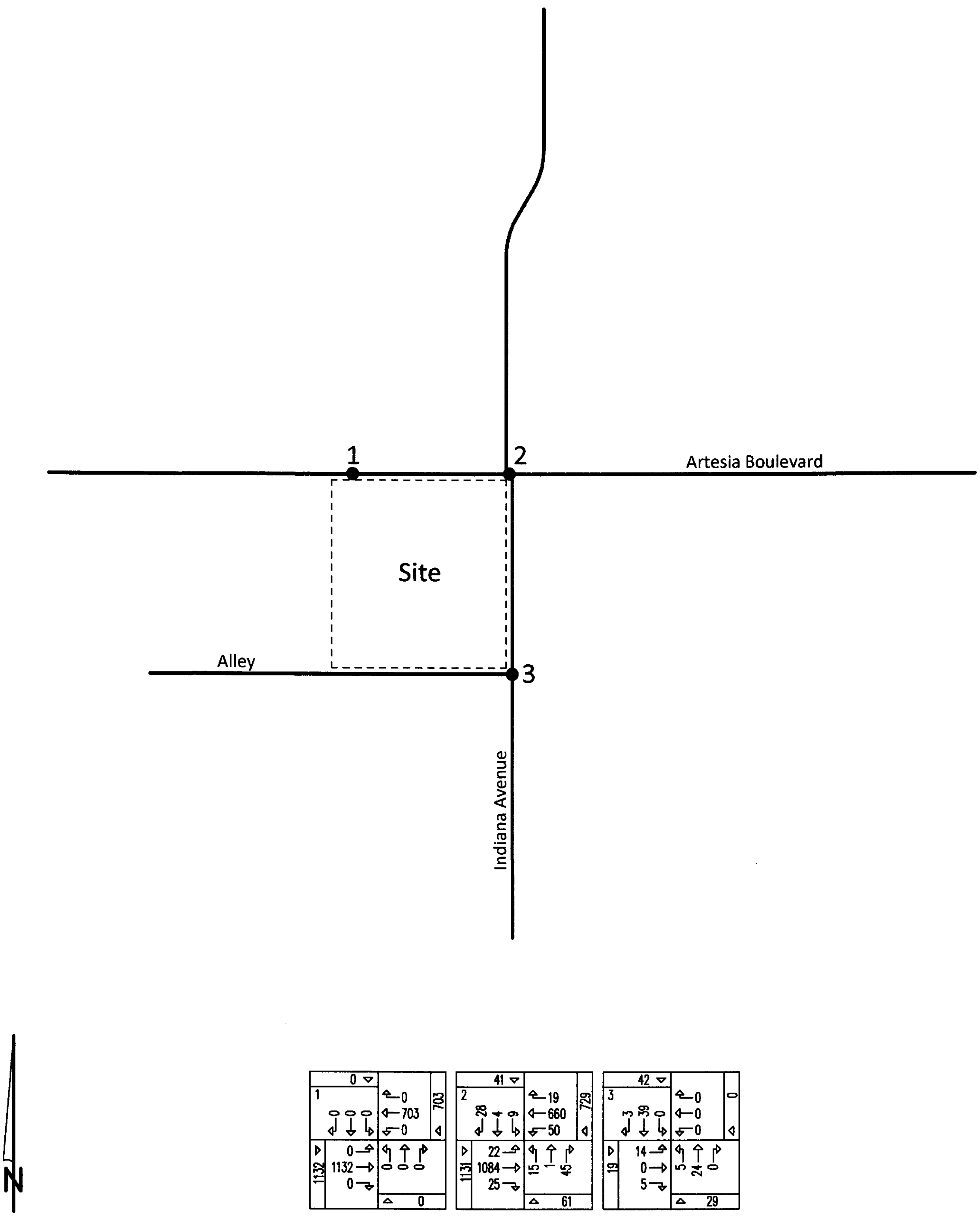
Figure 15
Existing Plus Ambient Growth
Evening Peak Hour Intersection Turning Movement Volumes



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Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

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VII. Existing Plus Ambient Growth Plus Project Traffic Conditions

In this section, Existing Plus Ambient Growth Plus Project traffic conditions are discussed. Figures 16 to 18 depict the Existing Plus Ambient Growth Plus Project traffic conditions.

A. Method of Projection

For Existing Plus Ambient Growth Plus Project traffic conditions, an areawide growth rate has been utilized to account for areawide growth on study area roadways. Existing Plus Ambient Growth Plus Project traffic volumes have been calculated based on a 1.0 percent annual growth rate of existing traffic volumes over a two (2) year period. The areawide growth rate has been obtained from the City of Long Beach Department of Transportation.

Areawide growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the project.

B. Existing Plus Ambient Growth Plus Project Average Daily Traffic Volumes

Existing Plus Ambient Growth Plus Project average daily traffic volumes are as illustrated on Figure 16.

C. Existing Plus Ambient Growth Plus Project Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix C. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a decimal. The decimal represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

All the study area intersections analyzed in this report are unsignalized intersections. The Intersection Delay Method for unsignalized intersections was calculated using the delay methodology in the 2000 Highway Capacity Manual throughout this traffic impact analysis.

The delay and Level of Service for the Existing Plus Ambient Growth Plus Project traffic conditions have been calculated and are shown in Table 4. Existing Plus Ambient Growth morning and evening peak hour intersection turning movement volumes are shown on Figures 17 and 18, respectively.

The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for Existing Plus Ambient Growth Plus Project traffic conditions, except for the following study area intersection that is projected to operate at an unacceptable Level of Service during the evening peak hour (see Table 4):

Indiana Avenue (NS) at:
Artesia Boulevard (EW) - #2

Existing Plus Ambient Growth Plus Project Intersection Delay worksheets are provided in Appendix C.

D. Significant Transportation Impact

In the City of Long Beach, the impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below for signalized intersections:

Significant Impact Threshold for Signalized Intersections		
Level of Service	Volume/Capacity	Incremental Increase
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91 - more	0.01 or more

In the City of Long Beach, the impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below for unsignalized intersections:

Significant Impact Threshold for Unsignalized Intersections		
Level of Service	Delay	Incremental Increase
E/F	35.01 - more	2.0 or more

Table 5 depicts the Existing Plus Ambient Growth Plus Project traffic contribution at the study area intersections. The study area intersections are not significantly impacted by the project (see Table 5).

Table 4

Existing Plus Ambient Growth Plus Project
Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Project Access (NS) - #1															
Artesia Boulevard (EW) - #1	**CSS**	0	0	**1**	0	0	0	0	2	0	0	2	0	9.7-A	13.0-B
Indiana Avenue (NS) at:															
Artesia Boulevard (EW) - #1	CSS	0	1	0	0	1	0	1	2	1	1	2	1	17.8-C	49.3-E
Alley (Project Access) (EW) - #2	CSS	0	1	0	0	1	0	0	1	0	0	0	0	8.8-A	9.2-A

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the 2000 Highway Capacity Manual. Overall average intersection delay and level of service are shown for intersections with all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] CSS = Cross Street Stop

Table 5

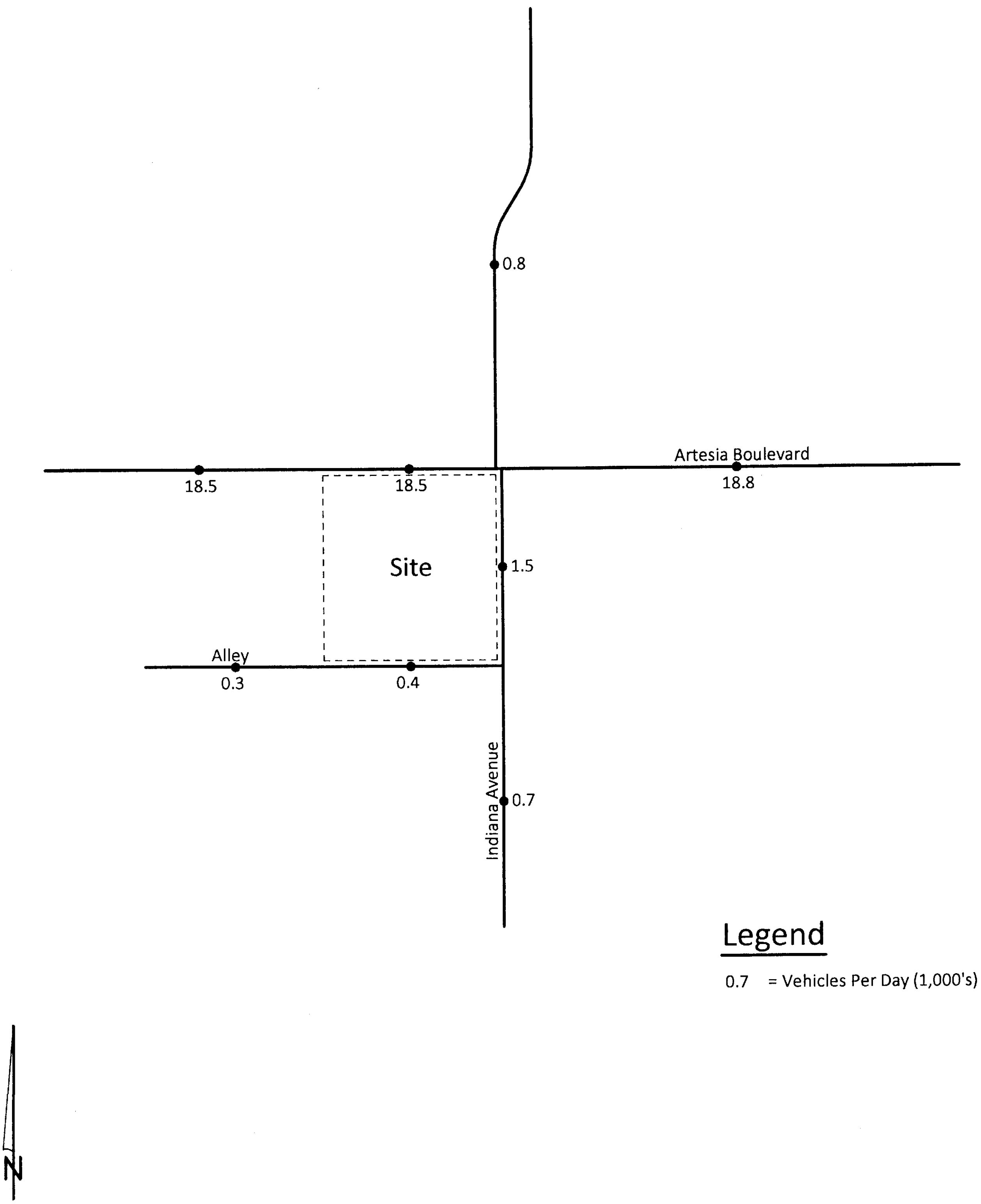
Existing Plus Ambient Growth Plus Project Traffic Contribution

Intersection	Peak Hour	Existing Plus Ambient Growth		Existing Plus Ambient Growth Plus Project							
				Without Mitigation				With Mitigation			
		Delay	Level of Service	Delay	Level of Service	Project Impact	Significant Impact[1]	Delay	Level of Service	Project Impact	Significant Impact
Indiana Avenue (NS) at:											
Artesia Boulevard (EW) - #2	Morning	17.8	C	17.8	C	0.0	No				
	Evening	48.5	E	49.3	F	0.8	No				
Alley (Project Access) (EW) - #3	Morning	8.7	A	8.8	A	0.1	No				
	Evening	9.2	A	9.2	A	0.0	No				

[1] In the City of Long Beach, impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below:

Significant Impact Threshold for Unsignalized Intersections		
Level of Service	Volume/Capacity	Incremental Increase
E/F	35.01-more	2.0 or more

Figure 16
Existing Plus Ambient Growth Plus Project Average Daily Traffic Volumes



4439/16

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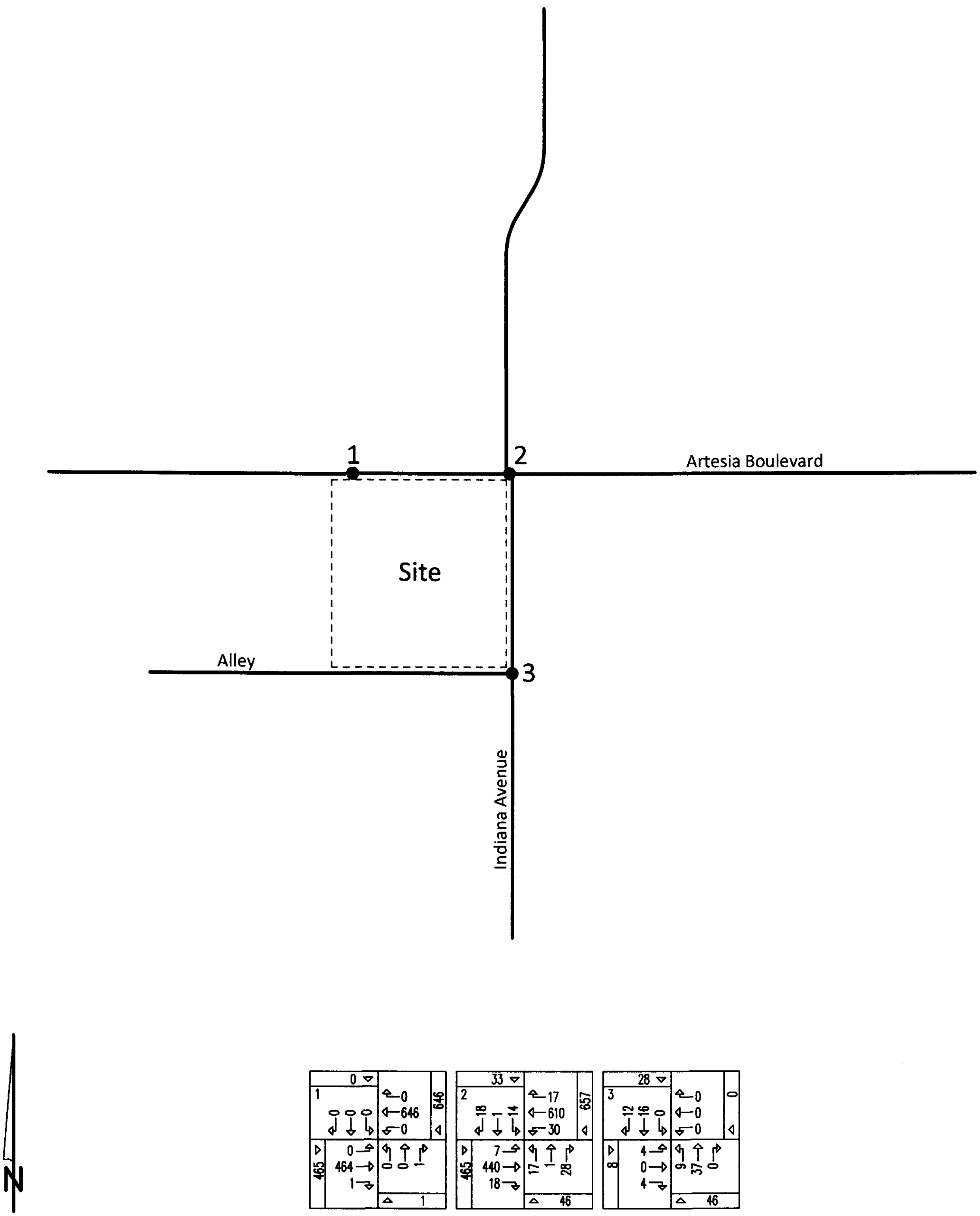
Figure 17
Existing Plus Ambient Growth Plus Project
Morning Peak Hour Intersection Turning Movement Volumes

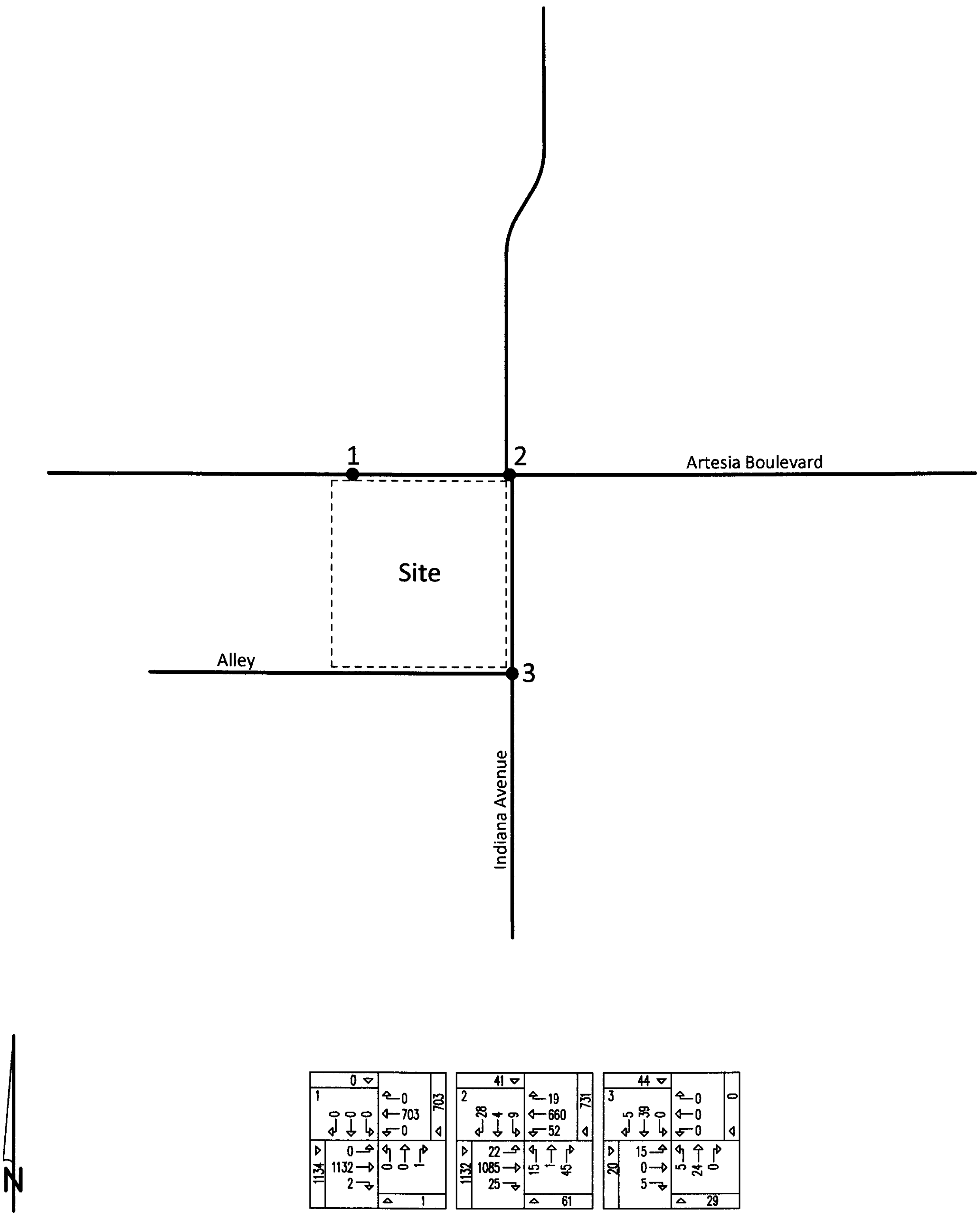


4439/bbas

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

Over 30 Years of Excellent Service

Figure 18
Existing Plus Ambient Growth Plus Project
Evening Peak Hour Intersection Turning Movement Volumes



4439/bbas

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 30 YEARS OF EXCELLENT SERVICE

VIII. Year 2011 Without Project Traffic Conditions

In this section, Year 2011 Without Project traffic conditions are discussed. Figures 19 to 29 depict the Year 2011 Without Project traffic conditions.

A. Method of Projection

To assess Year 2011 Without Project traffic conditions, existing traffic is combined with other development and areawide growth. Table 6 lists the proposed land uses for the other development (see Figure 19) obtained from the Cities of Long Beach, Paramount, Bellflower, and Lakewood.

Table 6 shows the daily and peak hour vehicle trips generated by the other development in the study area. Figures 20 to 23 contain the directional distributions of the other development traffic for the proposed land uses. The other development average daily traffic volumes are shown on Figure 24. Other development morning and evening peak hour intersection turning movement volumes are shown on Figures 25 and 26, respectively.

For Year 2011 Without Project traffic conditions, an areawide growth rate has been utilized to account for areawide growth on study area roadways. Year 2011 Without Project traffic volumes have been calculated based on a 1.0 percent annual growth rate of existing traffic volumes over a two (2) year period. The areawide growth rate has been obtained from the City of Long Beach Department of Transportation.

Areawide growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by other development.

B. Year 2011 Without Project Average Daily Traffic Volumes

Year 2011 Without Project average daily traffic volumes are as illustrated on Figure 27.

C. Year 2011 Without Project Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix C. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a decimal. The decimal represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

All the study area intersections analyzed in this report are unsignalized intersections. The Intersection Delay Method for unsignalized intersections was calculated using the delay methodology in the 2000 Highway Capacity Manual throughout this traffic impact analysis.

The delay and Level of Service for the Year 2011 Without Project traffic conditions have been calculated and are shown in Table 7. Year 2011 Without Project morning and evening peak hour intersection turning movement volumes are shown on Figures 28 and 29, respectively.

The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for Year 2011 Without Project traffic conditions, except for the following study area intersection that is projected to operate at an unacceptable Level of Service during the evening peak hour (see Table 7):

Indiana Avenue (NS) at:
Artesia Boulevard (EW) - #2

Year 2011 Without Project Intersection Delay worksheets are provided in Appendix C.

Table 6

Other Development Traffic Generation[1]

Traffic Analysis Zone	Land Use	Quantity	Units[2]	Peak Hour						Daily
				Morning			Evening			
				Inbound	Outbound	Total	Inbound	Outbound	Total	
1	Fire Station	11.080	TSF	9	1	10	1	9	10	77
	Emergency Support Center	4.632	TSF	5	1	6	1	6	7	46
	Subtotal			14	2	16	2	15	17	123
2	Single-Family Detached Residential	18	DU	3	10	13	12	7	19	172
3	Commercial Retail	54.200	TSF	65	42	107	207	215	422	4,561
4	Medical Office	14.000	TSF	25	7	32	13	35	48	506
Total				107	61	168	234	272	506	5,362

[1] Source: Institute of Transportation Engineers, Trip Generation, 8th Edition, 2008, Land Use Categories 110, 210, 720, 820

[2] TSF = Thousand Square Feet; DU = Dwelling Units

Table 7

Year 2011 Without Project
Intersection Delay and Level of Service

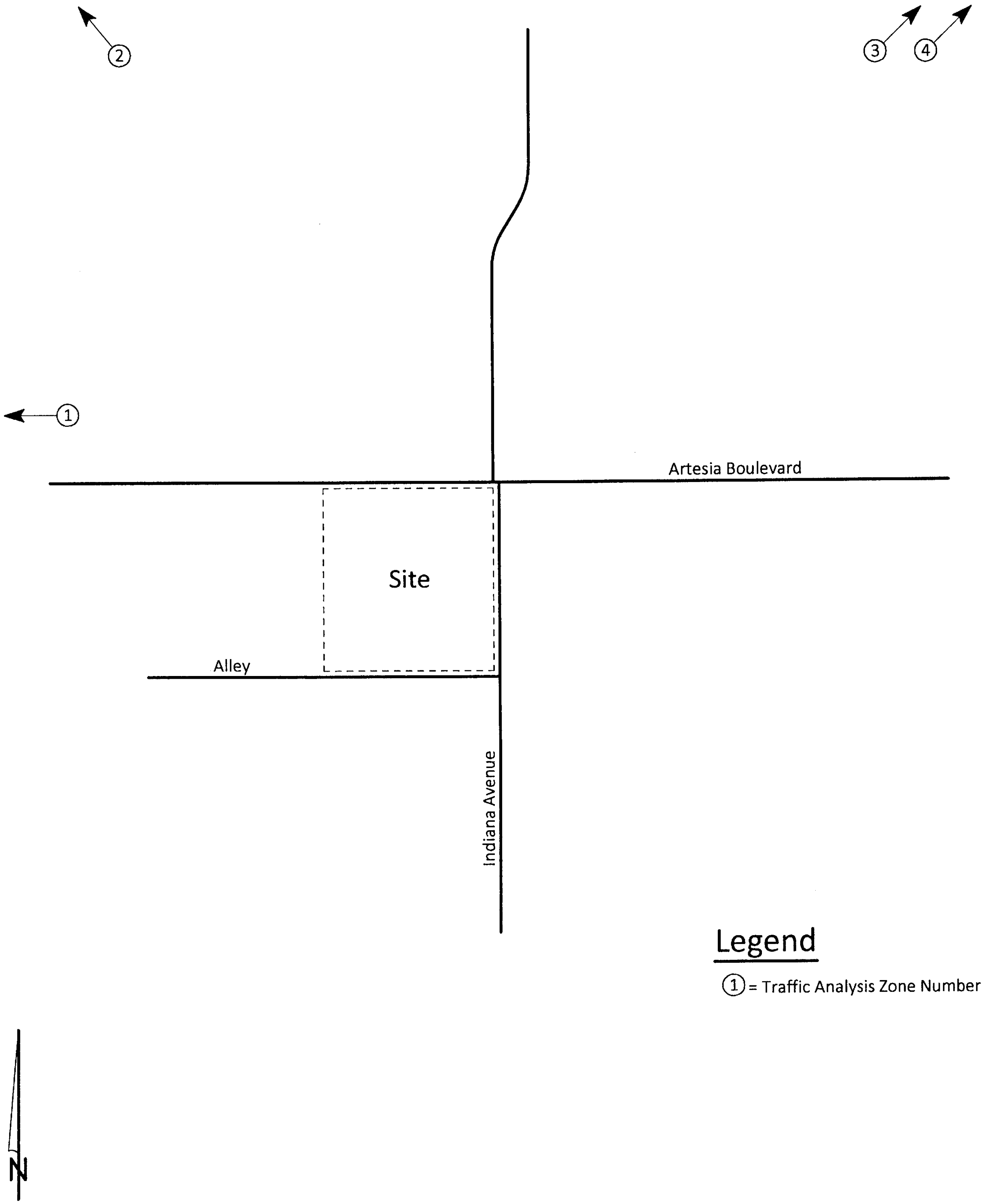
Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Indiana Avenue (NS) at:															
Artesia Boulevard (EW) - #2	CSS	0	1	0	0	1	0	1	2	1	1	2	1	18.0-C	54.1-F
Alley (Project Access) (EW) - #3	CSS	0	1	0	0	1	0	0	1	0	0	0	0	8.7-A	9.2-A

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the 2000 Highway Capacity Manual. Overall average intersection delay and level of service are shown for intersections with all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] CSS = Cross Street Stop

Figure 19
Other Development Traffic Analysis Zone Map



4439/19

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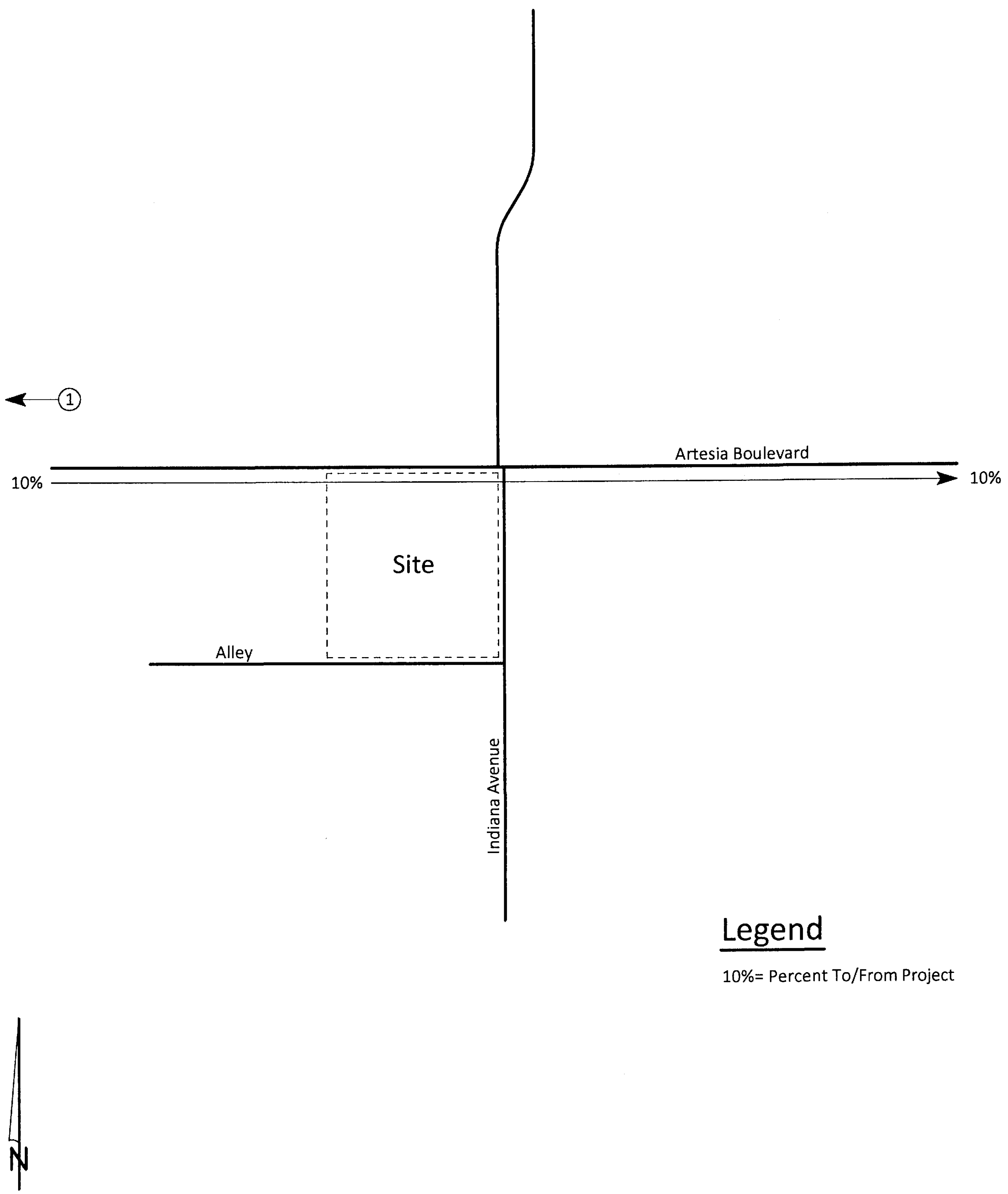
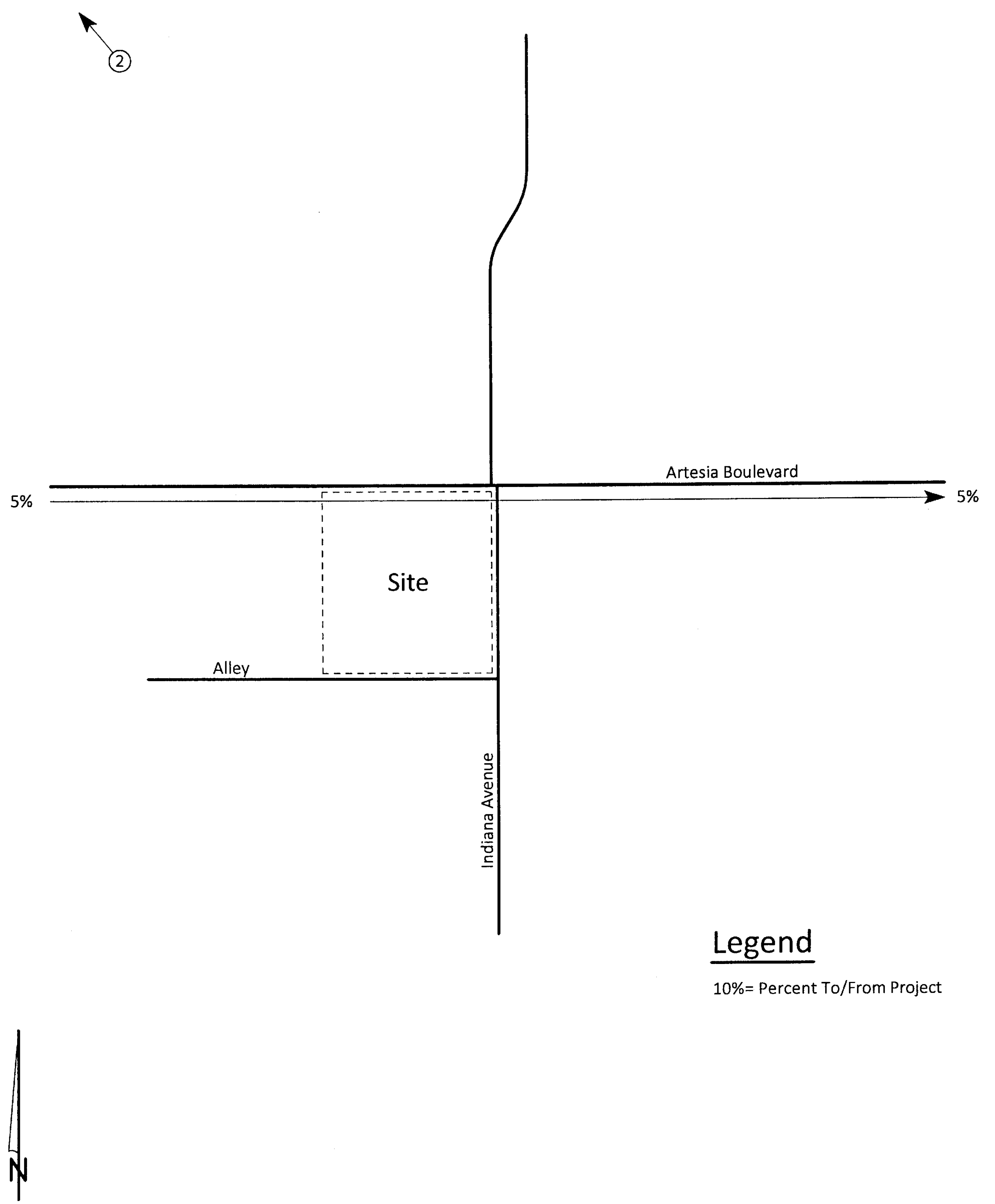
Figure 20
Other Development (Traffic Analysis Zone 1) Traffic Distribution



KUNZMAN ASSOCIATES, INC.
OVER 30 YEARS OF EXCELLENT SERVICE

Figure 21
Other Development (Traffic Analysis Zone 2) Traffic Distribution



KUNZMAN ASSOCIATES, INC.
OVER 30 YEARS OF EXCELLENT SERVICE

Figure 22
Other Development (Traffic Analysis Zone 3) Traffic Distribution

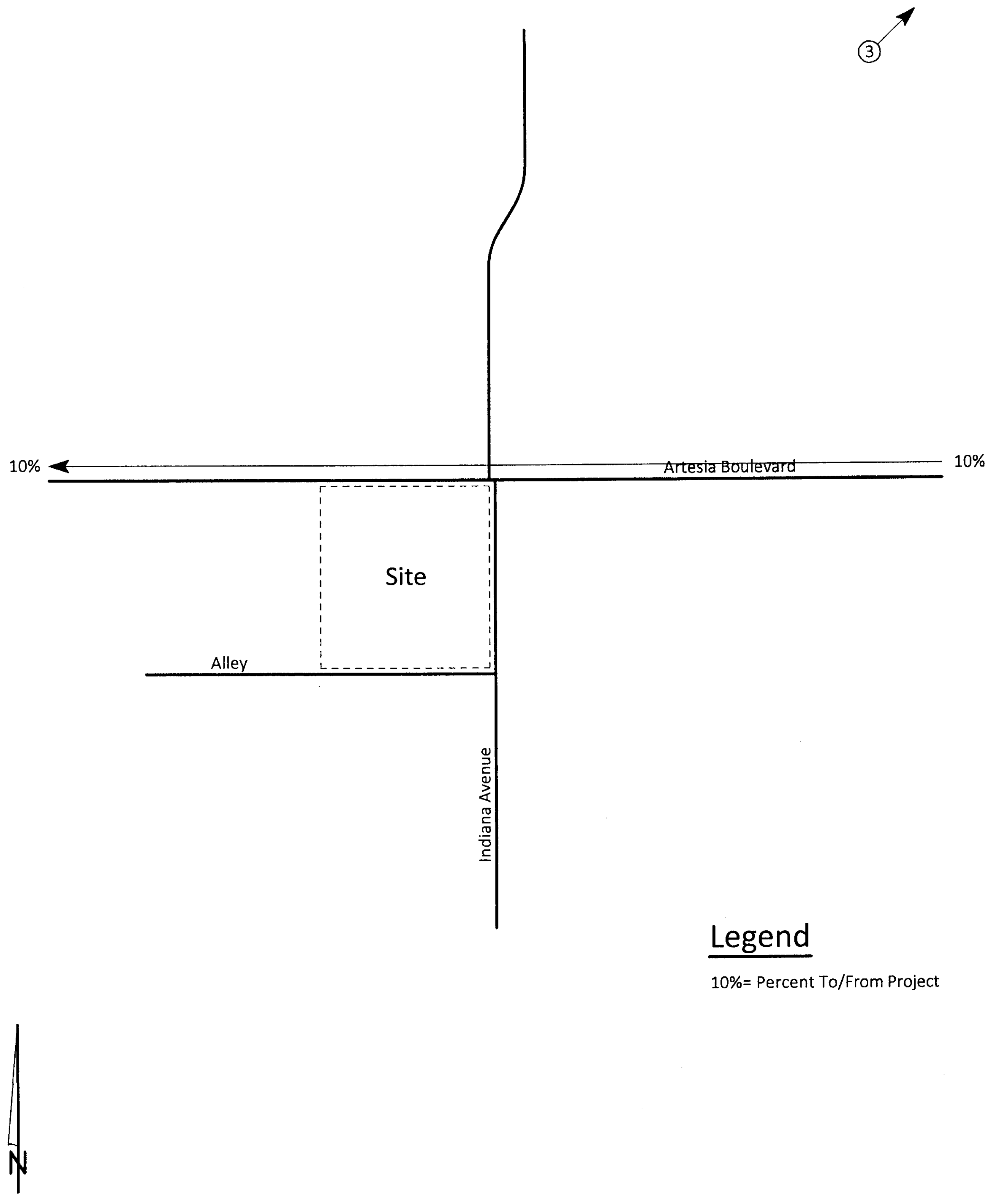


Figure 23
Other Development (Traffic Analysis Zone 4) Traffic Distribution

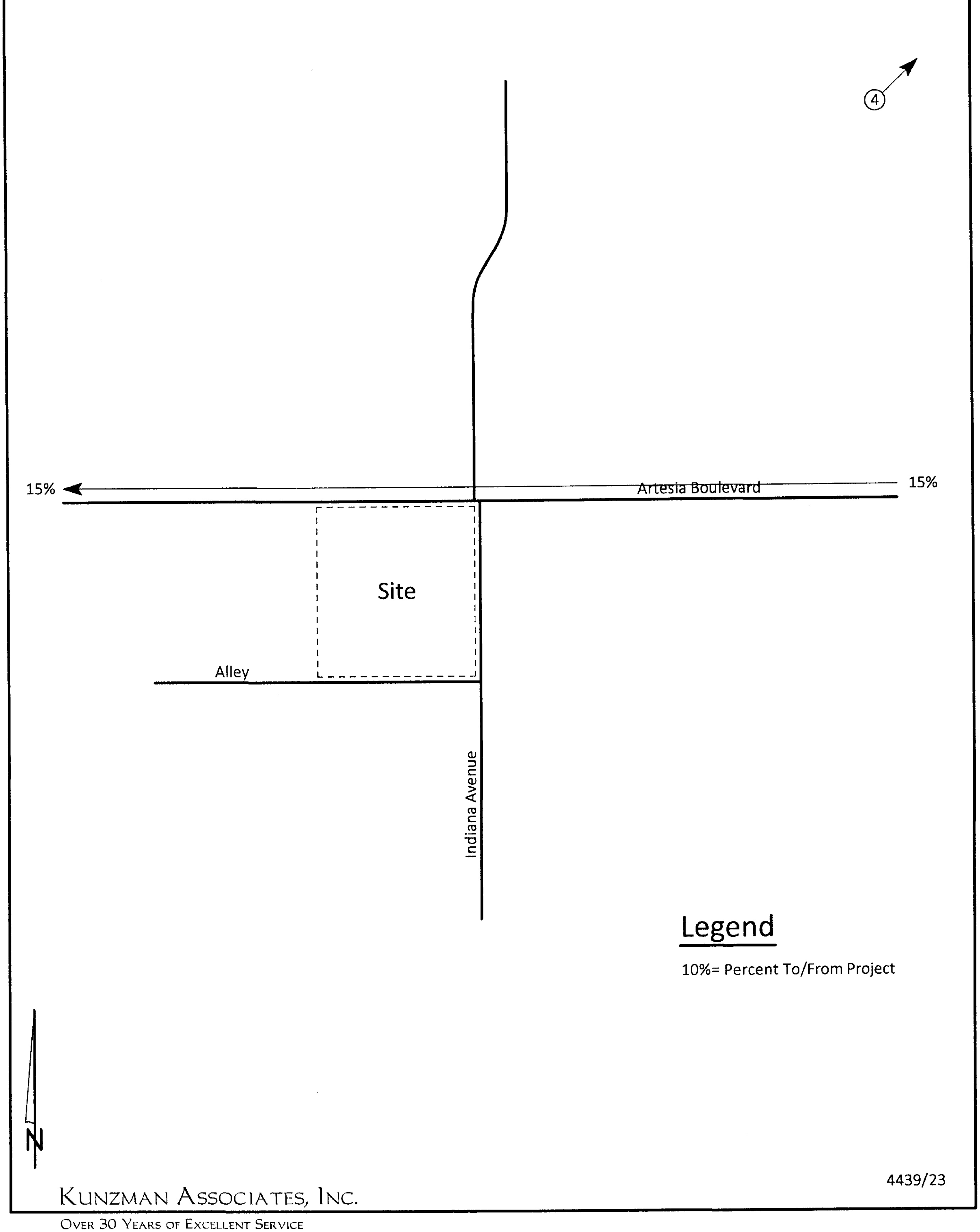
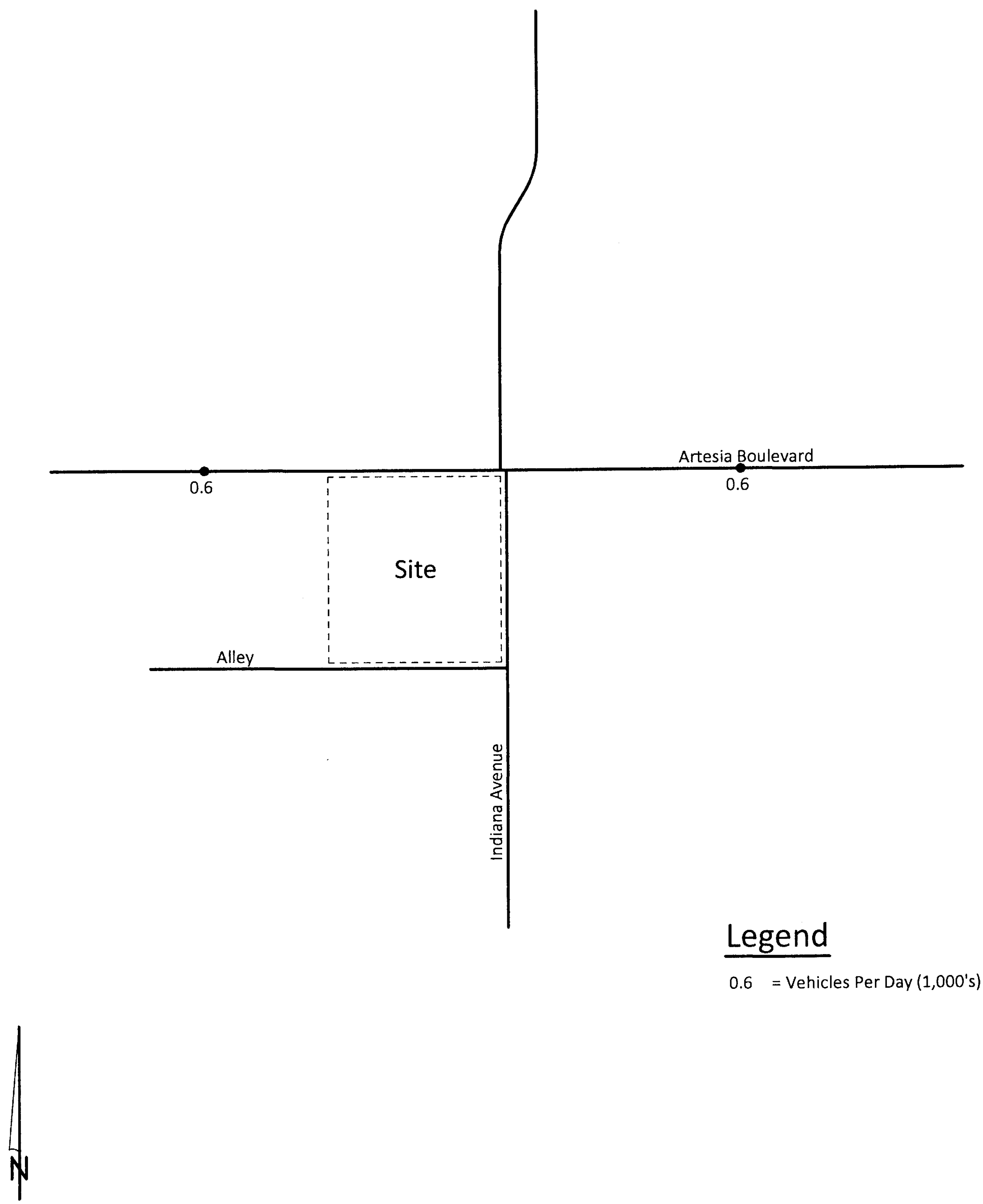
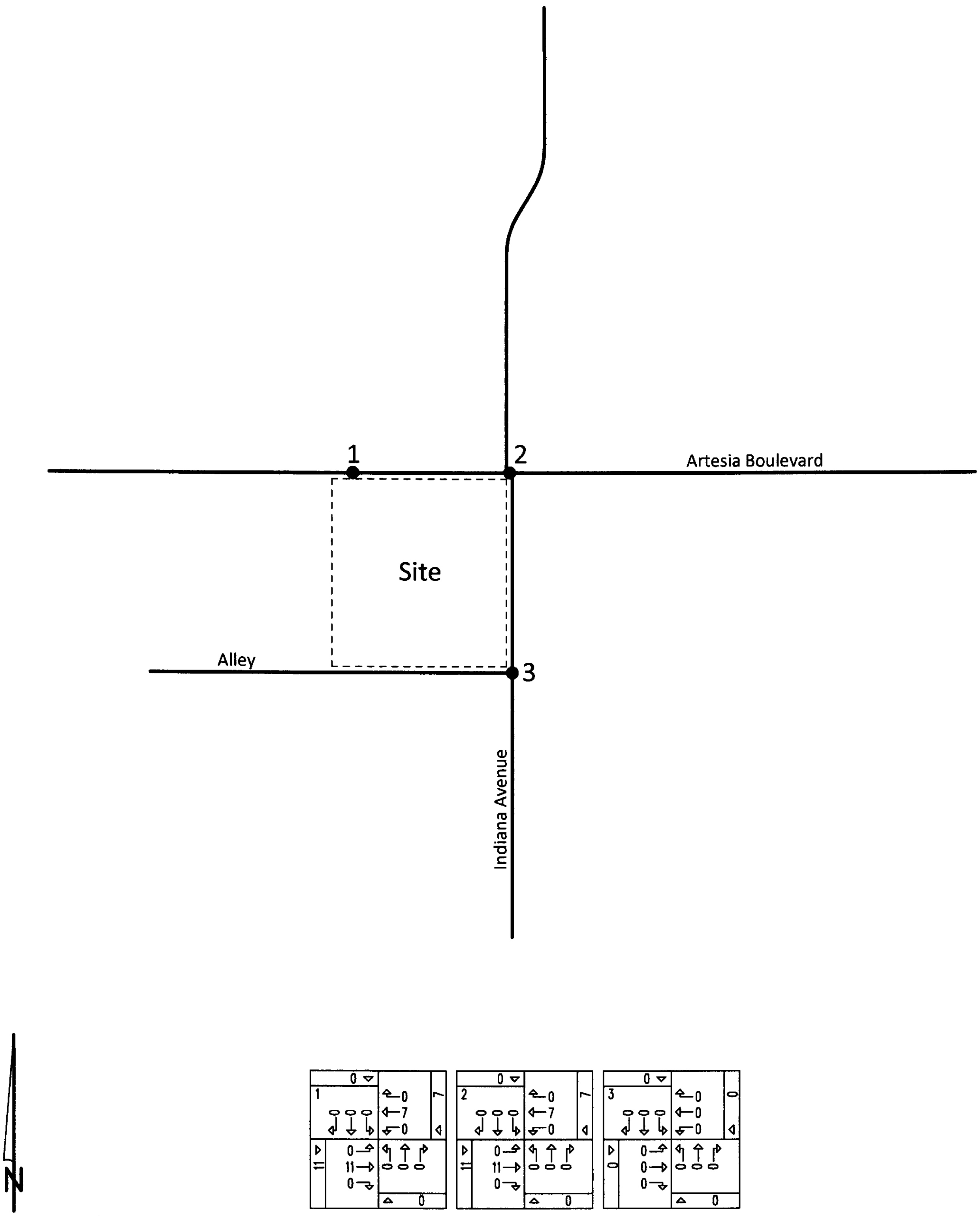


Figure 24
Other Development Average Daily Traffic Volumes



4439/24

Figure 25
Other Development
Morning Peak Hour Intersection Turning Movement Volumes

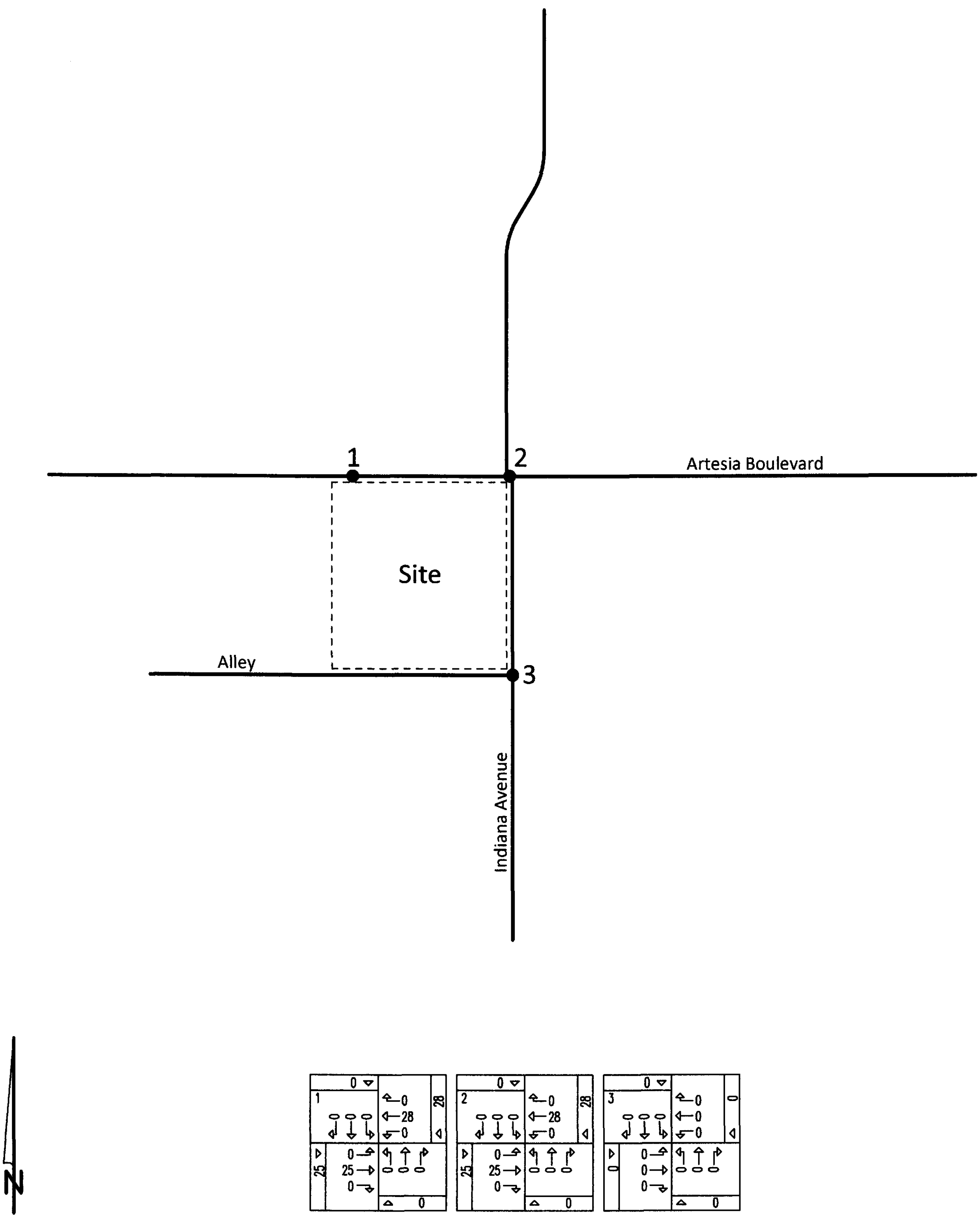


4439/bbas

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 30 YEARS OF EXCELLENT SERVICE

Figure 26
Other Development
Evening Peak Hour Intersection Turning Movement Volumes

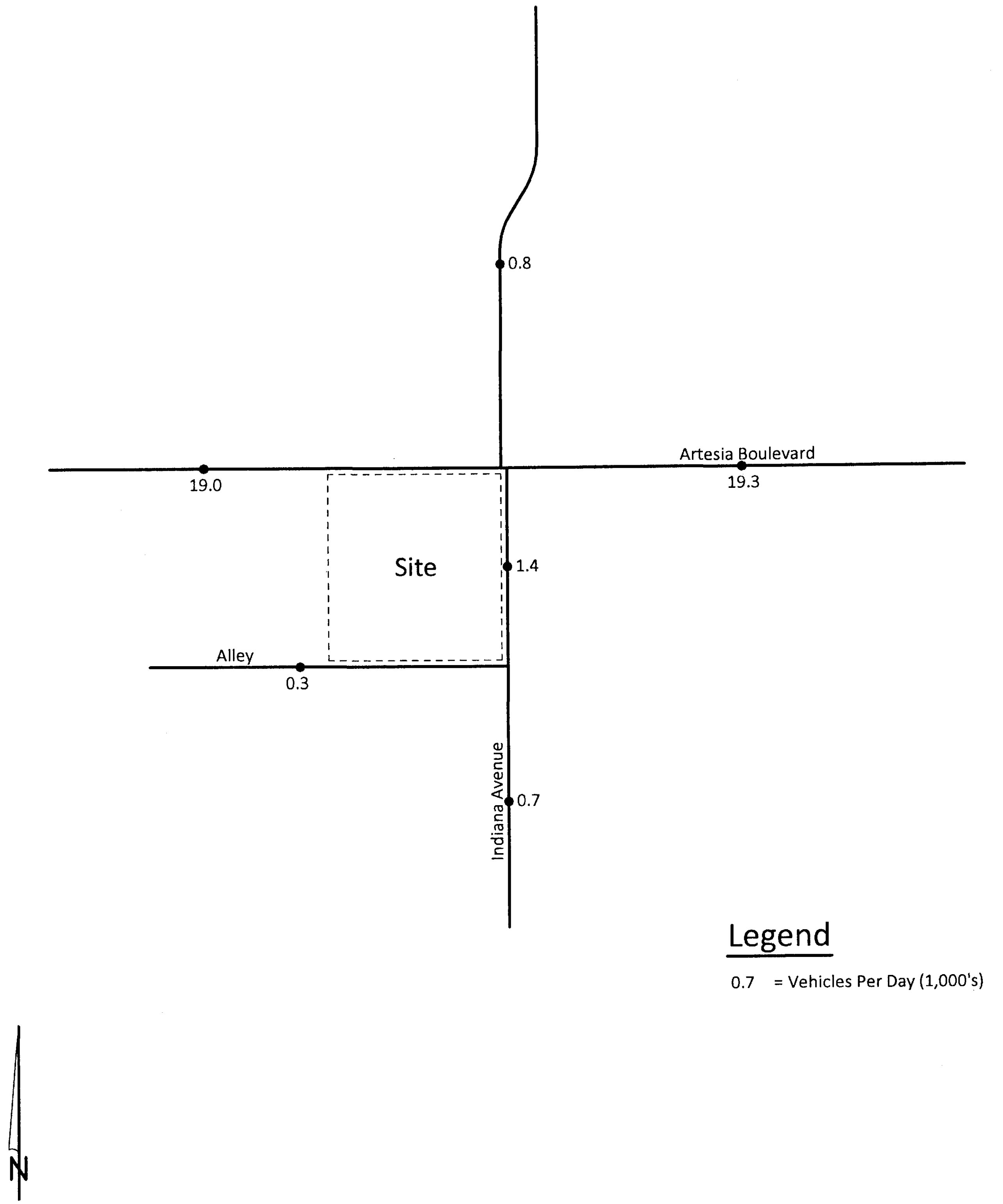


4439/bbas

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

Over 30 Years of Excellent Service

Figure 27
Year 2011 Without Project Average Daily Traffic Volumes



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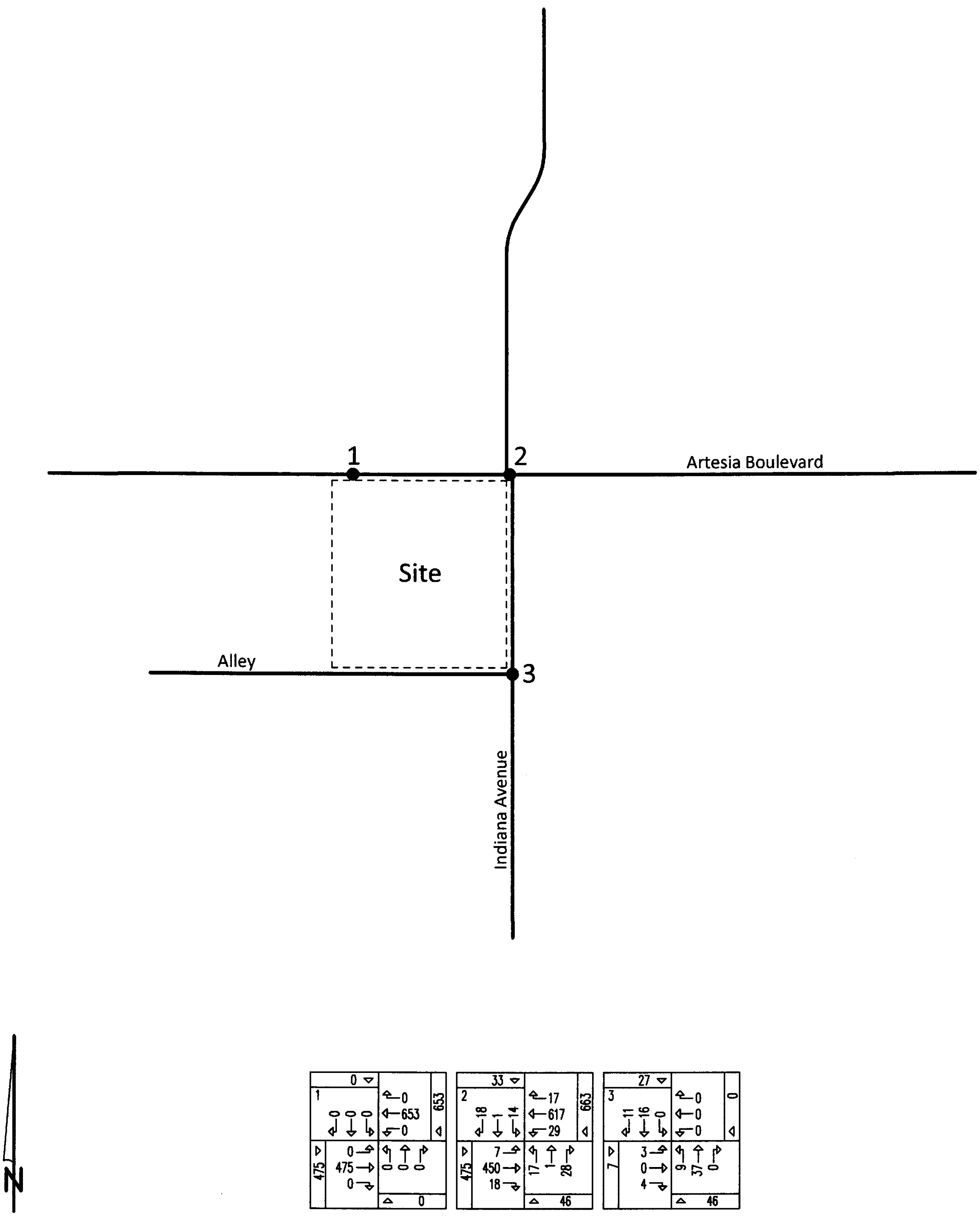
KUNZMAN ASSOCIATES, INC.

OVER 30 YEARS OF EXCELLENT SERVICE

Figure 28
Year 2011 Without Project
Morning Peak Hour Intersection Turning Movement Volumes

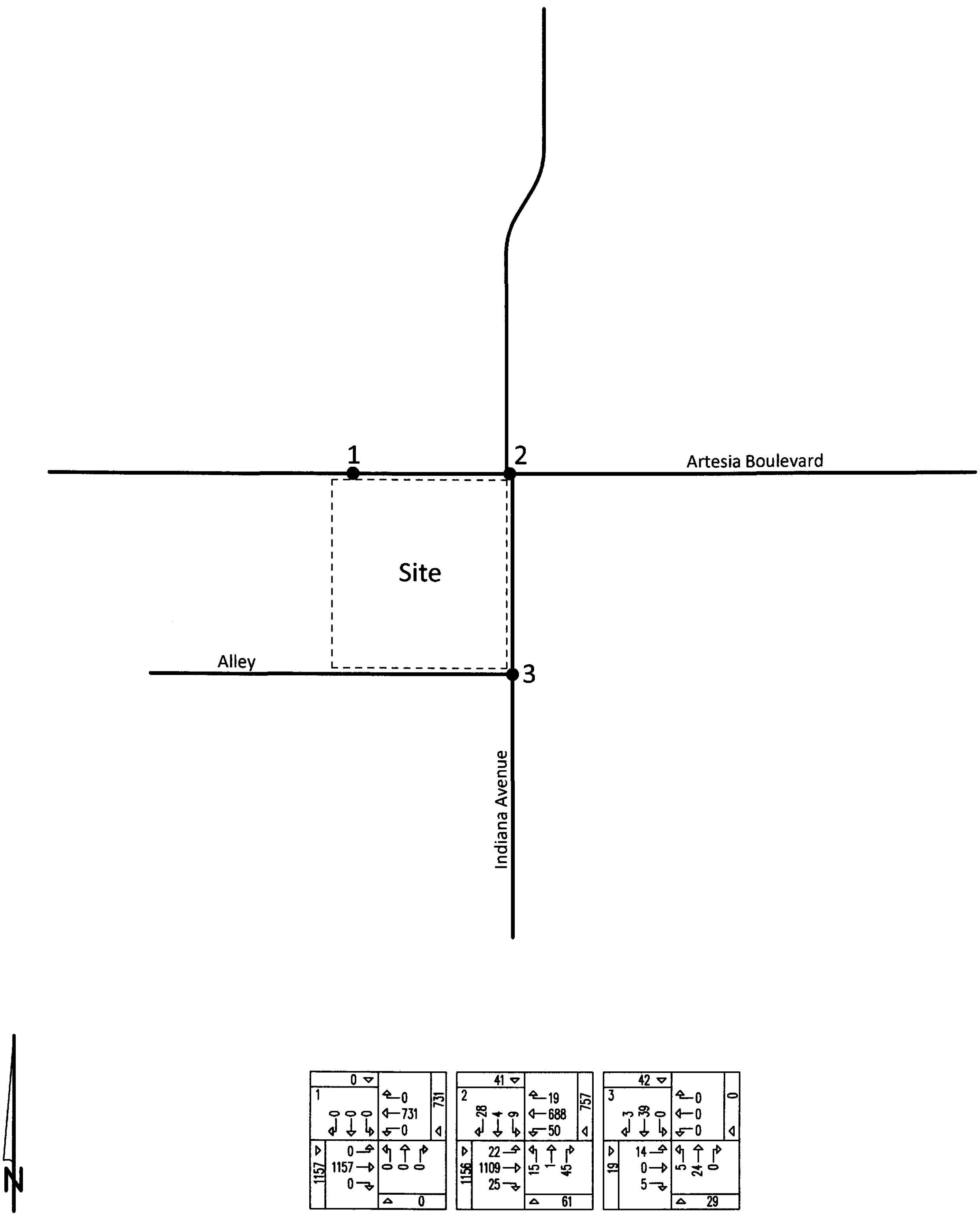


4439/bbas

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 30 YEARS OF EXCELLENT SERVICE

Figure 29
Year 2011 Without Project
Evening Peak Hour Intersection Turning Movement Volumes



4439/bbas

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 30 YEARS OF EXCELLENT SERVICE

IX. Year 2011 With Project Traffic Conditions

In this section, Year 2011 With Project traffic conditions are discussed. Figures 30 to 32 depict the Year 2011 With Project traffic conditions.

A. Method of Projection

To assess Year 2011 With Project traffic conditions, existing traffic is combined with the project, other development, and areawide growth.

For Year 2011 With Project traffic conditions, an areawide growth rate has been utilized to account for areawide growth on study area roadways. Year 2011 With Project traffic volumes have been calculated based on a 1.0 percent annual growth rate of existing traffic volumes over a two (2) year period. The areawide growth rate has been obtained from the City of Long Beach Department of Transportation.

Areawide growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the project and other development.

B. Year 2011 With Project Average Daily Traffic Volumes

Year 2011 With Project average daily traffic volumes are as illustrated on Figure 30.

C. Year 2011 With Project Levels of Service

The technique used to assess the operation of a signalized intersection is known as Intersection Capacity Utilization, as described in Appendix C. To calculate an Intersection Capacity Utilization value, the volume of traffic using the intersection is compared with the capacity of the intersection. An Intersection Capacity Utilization value is usually expressed as a decimal. The decimal represents that portion of the hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity.

The technique used to assess the capacity needs of an unsignalized intersection is known as the Intersection Delay Method (see Appendix C). To calculate delay, the volume of traffic using the intersection is compared with the capacity of the intersection.

All the study area intersections analyzed in this report are unsignalized intersections. The Intersection Delay Method for unsignalized intersections was calculated using the delay methodology in the 2000 Highway Capacity Manual throughout this traffic impact analysis.

The delay and Level of Service for the Year 2011 With Project traffic conditions have been calculated and are shown in Table 8. Year 2011 With Project morning and evening peak hour intersection turning movement volumes are shown on Figures 31 and 32, respectively.

The study area intersections are projected to operate at acceptable Levels of Service during the peak hours for Year 2011 With Project traffic conditions, except for the following study area intersection that is projected to operate at an unacceptable Level of Service during the evening peak hour (see Table 8):

Indiana Avenue (NS) at:
Artesia Boulevard (EW) - #2

Year 2011 With Project Intersection Delay worksheets are provided in Appendix C.

D. Significant Transportation Impact

In the City of Long Beach, the impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below for signalized intersections:

Significant Impact Threshold for Signalized Intersections		
Level of Service	Volume/Capacity	Incremental Increase
C	0.71-0.80	0.04 or more
D	0.81-0.90	0.02 or more
E/F	0.91 - more	0.01 or more

In the City of Long Beach, the impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below for unsignalized intersections:

Significant Impact Threshold for Unsignalized Intersections		
Level of Service	Delay	Incremental Increase
E/F	35.01 - more	2.0 or more

Table 9 depicts the Year 2011 With Project traffic contribution at the study area intersections. The study area intersections are not significantly impacted by the project (see Table 9).

Table 8

Year 2011 With Project
Intersection Delay and Level of Service

Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Peak Hour Delay-LOS[2]	
		Northbound			Southbound			Eastbound			Westbound				
		L	T	R	L	T	R	L	T	R	L	T	R	Morning	Evening
Project Access (NS) - #1															
Artesia Boulevard (EW) - #1	**CSS**	0	0	**1**	0	0	0	0	2	0	0	2	0	9.8-A	13.2-B
Indiana Avenue (NS) at:															
Artesia Boulevard (EW) - #1	CSS	0	1	0	0	1	0	1	2	1	1	2	1	18.1-C	55.0-F
Alley (Project Access) (EW) - #2	CSS	0	1	0	0	1	0	0	1	0	0	0	0	8.8-A	9.2-A

[1] When a right turn lane is designated, the lane can either be striped or unstriped. To function as a right turn lane, there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; **1** = Improvement

[2] Delay and level of service has been calculated using the following analysis software: Traffix, Version 7.9.0215 (2008). Per the 2000 Highway Capacity Manual. Overall average intersection delay and level of service are shown for intersections with all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

[2] CSS = Cross Street Stop

Table 9

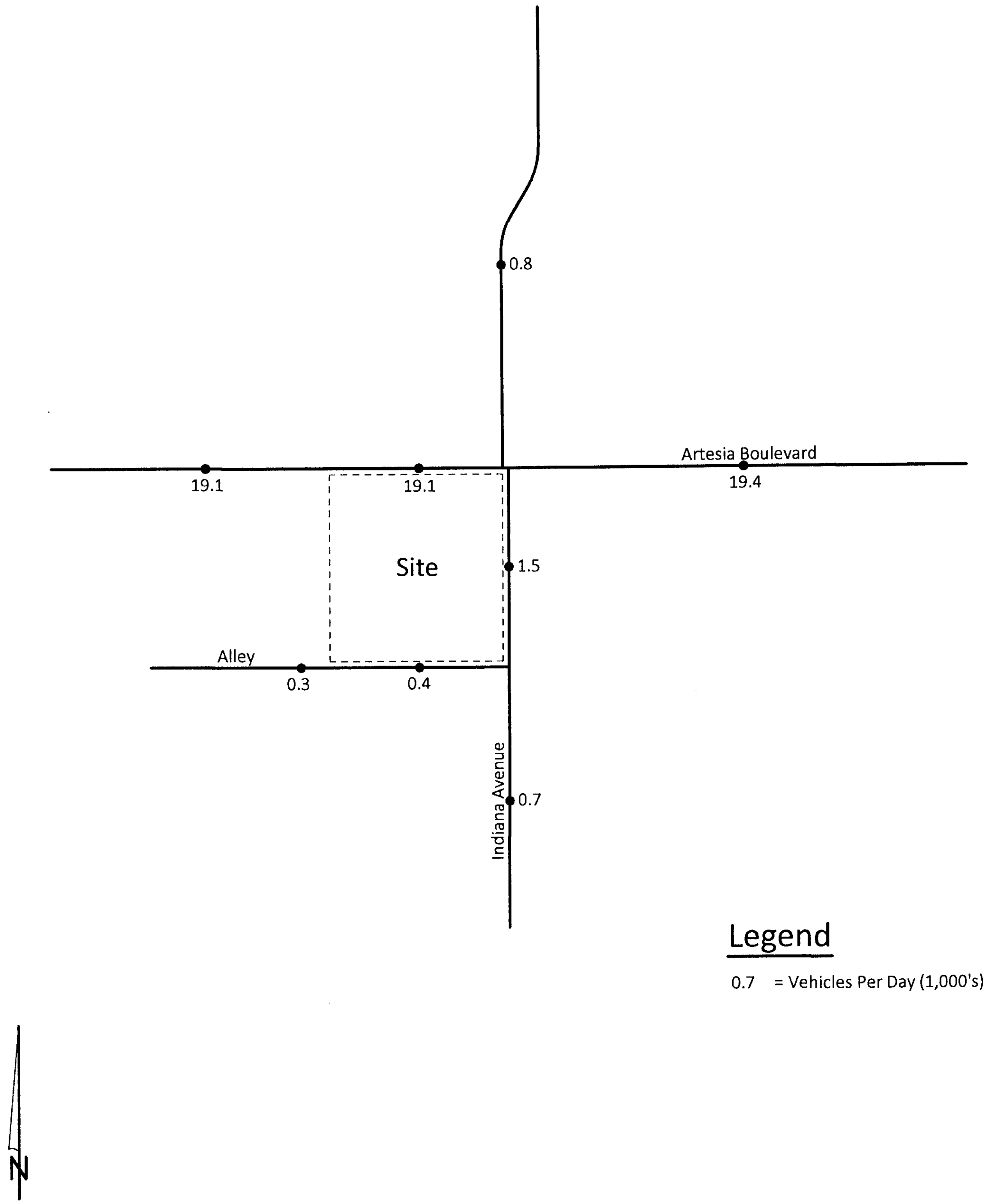
Year 2011 With Project Traffic Contribution

Intersection	Peak Hour	Year 2011 Without Project		Year 2011 With Project							
				Without Mitigation				With Mitigation			
		Delay	Level of Service	Delay	Level of Service	Project Impact	Significant Impact[1]	Delay	Level of Service	Project Impact	Significant Impact
Indiana Avenue (NS) at:											
Artesia Boulevard (EW) - #2	Morning	18.0	C	18.1	C	0.1	No				
	Evening	54.1	F	55.0	F	0.9	No				
Alley (Project Access) (EW) - #3	Morning	8.7	A	8.8	A	0.1	No				
	Evening	9.2	A	9.2	A	0.0	No				

[1] In the City of Long Beach, impact is considered significant if the project related increase in the volume to capacity ratio equals or exceeds the thresholds shown below:

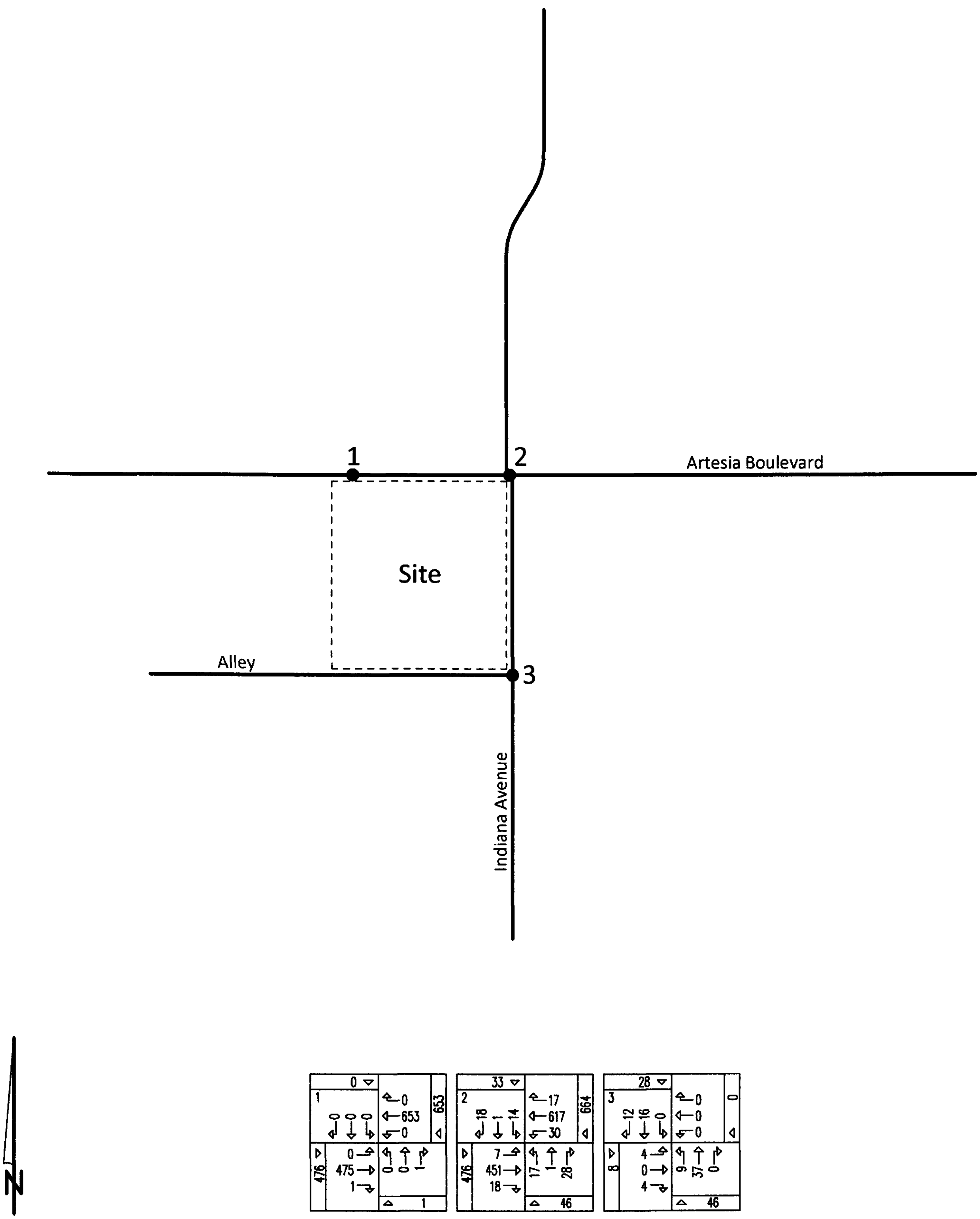
Significant Impact Threshold for Unsignalized Intersections		
Level of Service	Volume/Capacity	Incremental Increase
E/F	35.01-more	2.0 or more

Figure 30
Year 2011 With Project Average Daily Traffic Volumes



4439/30

Figure 31
Year 2011 With Project
Morning Peak Hour Intersection Turning Movement Volumes

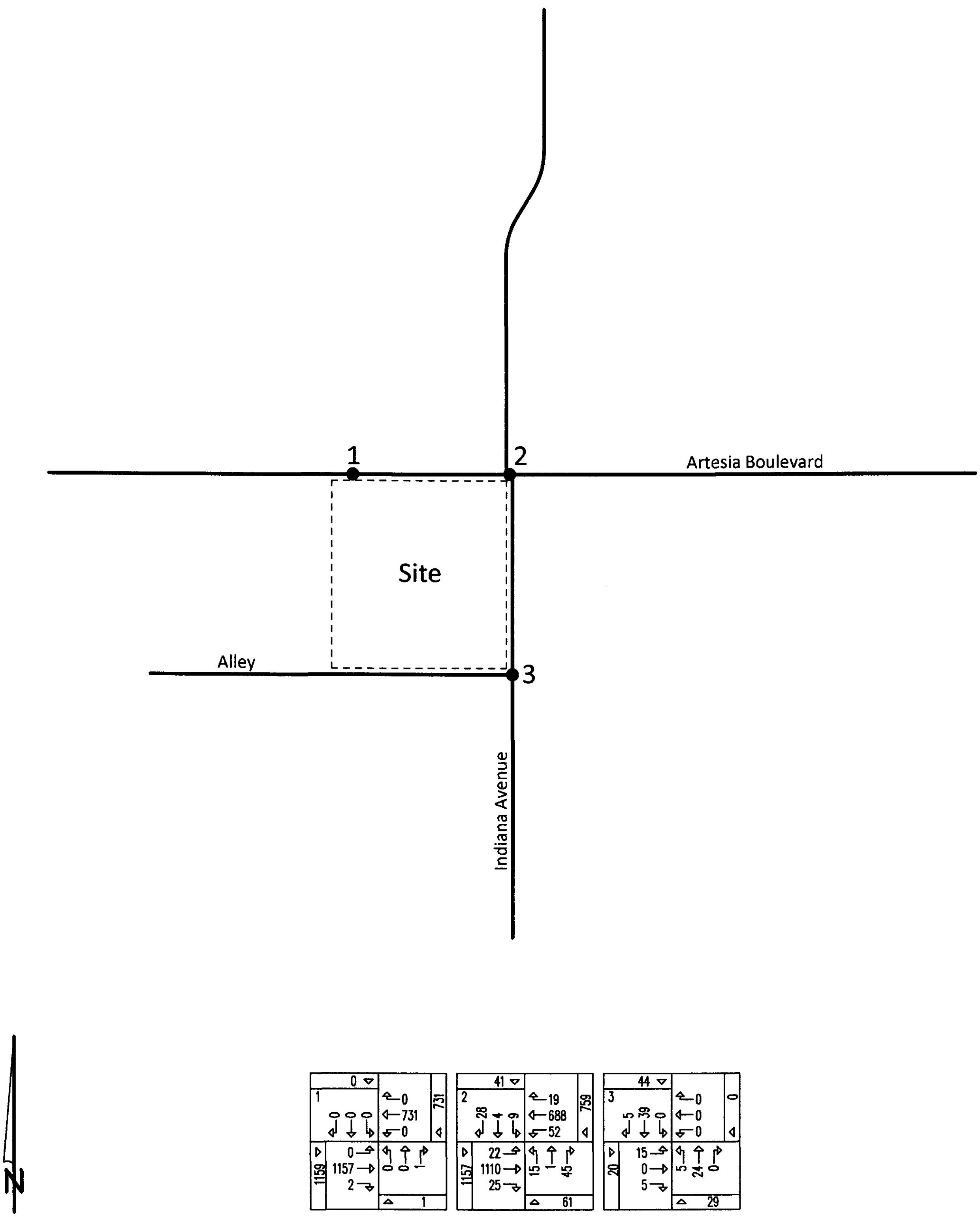


4439/bbas

KUNZMAN ASSOCIATES, INC. Intersection reference numbers are in upper left corner of turning movement boxes.

OVER 30 YEARS OF EXCELLENT SERVICE

Figure 32
Year 2011 With Project
Evening Peak Hour Intersection Turning Movement Volumes



4439/bbas

Kunzman Associates, Inc. Intersection reference numbers are in upper left corner of turning movement boxes.

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X. Recommendations

A. Site Access

The project site will have access to Indiana Avenue and Artesia Boulevard.

B. Roadway Improvements

Site-specific circulation and access recommendations are depicted on Figure 33.

Construct Indiana Avenue from Artesia Boulevard to the Alley at its ultimate half-section width including landscaping and parkway improvements in conjunction with development.

Construct Artesia Boulevard from the west project boundary to Indiana Avenue at its ultimate half-section width as a Major Highway including landscaping and parkway improvements in conjunction with development.

Sufficient on-site parking shall be provided to meet City of Long Beach parking code requirements.

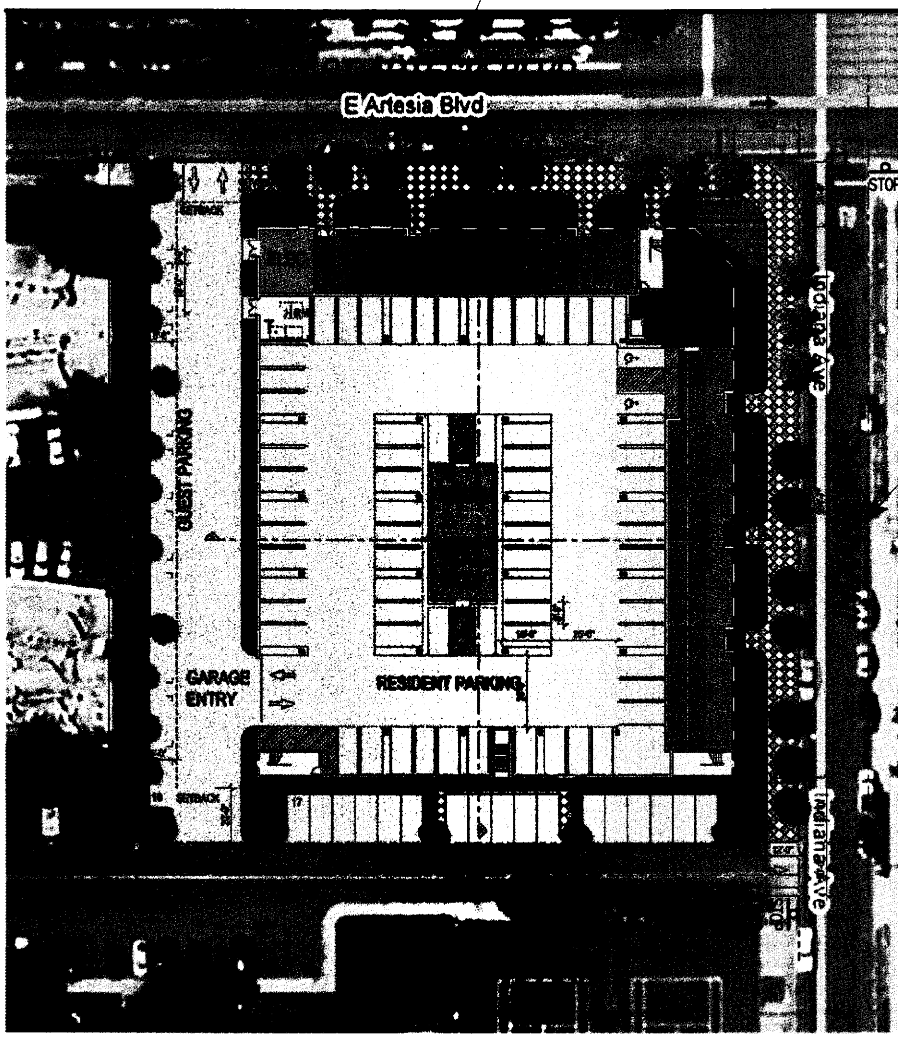
Sight distance at the project accesses should be reviewed with respect to California Department of Transportation/City of Long Beach standards in conjunction with the preparation of final grading, landscaping, and street improvement plans.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

As is the case for any roadway design, the City of Long Beach should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Figure 33
Circulation Recommendations

Construct Artesia Boulevard from the west project boundary to Indiana Avenue at its ultimate half-section width as a Major Highway including landscaping and parkway improvements in conjunction with development.



Construct Indian Avenue from Artesia Boulevard to the Alley at its ultimate half-section width including landscaping and parkway improvements in conjunction with development.

Sufficient on-site parking shall be provided to meet City of Long Beach parking code requirements.

Sight distance at the project accesses should be reviewed with respect to California Department of Transportation/City of Long Beach standards in conjunction with the preparation of final grading, landscaping, and street improvement plans.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the project.

As is the case for any roadway design, the City of Long Beach should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

Legend

STOP = Stop Sign

N

4439/33

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OVER 30 YEARS OF EXCELLENT SERVICE

Appendices

Appendix A – Glossary of Transportation Terms

Appendix B – Traffic Count Worksheets

Appendix C – Explanation and Calculation of Intersection Capacity Utilization and Intersection Delay

APPENDIX A

Glossary of Transportation Terms

GLOSSARY OF TRANSPORTATION TERMS

COMMON ABBREVIATIONS

AC:	Acres
ADT:	Average Daily Traffic
Caltrans:	California Department of Transportation
DU:	Dwelling Unit
ICU:	Intersection Capacity Utilization
LOS:	Level of Service
TSF:	Thousand Square Feet
V/C:	Volume/Capacity
VMT:	Vehicle Miles Traveled

TERMS

AVERAGE DAILY TRAFFIC: The total volume during a year divided by the number of days in a year. Usually only weekdays are included.

BANDWIDTH: The number of seconds of green time available for through traffic in a signal progression.

BOTTLENECK: A constriction along a travelway that limits the amount of traffic that can proceed downstream from its location.

CAPACITY: The maximum number of vehicles that can be reasonably expected to pass over a given section of a lane or a roadway in a given time period.

CHANNELIZATION: The separation or regulation of conflicting traffic movements into definite paths of travel by the use of pavement markings, raised islands, or other suitable means to facilitate the safe and orderly movements of both vehicles and pedestrians.

CLEARANCE INTERVAL: Nearly same as yellow time. If there is an all red interval after the end of a yellow, then that is also added into the clearance interval.

CORDON: An imaginary line around an area across which vehicles, persons, or other items are counted (in and out).

CYCLE LENGTH: The time period in seconds required for one complete signal cycle.

CUL-DE-SAC STREET: A local street open at one end only, and with special provisions for turning around.

DAILY CAPACITY: The daily volume of traffic that will result in a volume during the peak hour equal to the capacity of the roadway.

DELAY: The time consumed while traffic is impeded in its movement by some element over which it has no control, usually expressed in seconds per vehicle.

DEMAND RESPONSIVE SIGNAL: Same as traffic-actuated signal.

DENSITY: The number of vehicles occupying in a unit length of the through traffic lanes of a roadway at any given instant. Usually expressed in vehicles per mile.

DETECTOR: A device that responds to a physical stimulus and transmits a resulting impulse to the signal controller.

DESIGN SPEED: A speed selected for purposes of design. Features of a highway, such as curvature, superelevation, and sight distance (upon which the safe operation of vehicles is dependent) are correlated to design speed.

DIRECTIONAL SPLIT: The percent of traffic in the peak direction at any point in time.

DIVERSION: The rerouting of peak hour traffic to avoid congestion.

FORCED FLOW: Opposite of free flow.

FREE FLOW: Volumes are well below capacity. Vehicles can maneuver freely and travel is unimpeded by other traffic.

GAP: Time or distance between successive vehicles in a traffic stream, rear bumper to front bumper.

HEADWAY: Time or distance spacing between successive vehicles in a traffic stream, front bumper to front bumper.

INTERCONNECTED SIGNAL SYSTEM: A number of intersections that are connected to achieve signal progression.

LEVEL OF SERVICE: A qualitative measure of a number of factors, which include speed and travel time, traffic interruptions, freedom to maneuver, safety, driving comfort and convenience, and operating costs.

LOOP DETECTOR: A vehicle detector consisting of a loop of wire embedded in the roadway, energized by alternating current and producing an output circuit closure when passed over by a vehicle.

MINIMUM ACCEPTABLE GAP: Smallest time headway between successive vehicles in a traffic stream into which another vehicle is willing and able to cross or merge.

MULTI-MODAL: More than one mode; such as automobile, bus transit, rail rapid transit, and bicycle transportation modes.

OFFSET: The time interval in seconds between the beginning of green at one intersection and the beginning of green at an adjacent intersection.

PLATOON: A closely grouped component of traffic that is composed of several vehicles moving, or standing ready to move, with clear spaces ahead and behind.

ORIGIN-DESTINATION SURVEY: A survey to determine the point of origin and the point of destination for a given vehicle trip.

PASSENGER CAR EQUIVALENTS (PCE): One car is one Passenger Car Equivalent. A truck is equal to 2 or 3 Passenger Car Equivalents in that a truck requires longer to start, goes slower, and accelerates slower. Loaded trucks have a higher Passenger Car Equivalent than empty trucks.

PEAK HOUR: The 60 consecutive minutes with the highest number of vehicles.

PRETIMED SIGNAL: A type of traffic signal that directs traffic to stop and go on a predetermined time schedule without regard to traffic conditions. Also, fixed time signal.

PROGRESSION: A term used to describe the progressive movement of traffic through several signalized intersections.

SCREEN-LINE: An imaginary line or physical feature across which all trips are counted, normally to verify the validity of mathematical traffic models.

SIGNAL CYCLE: The time period in seconds required for one complete sequence of signal indications.

SIGNAL PHASE: The part of the signal cycle allocated to one or more traffic movements.

STARTING DELAY: The delay experienced in initiating the movement of queued traffic from a stop to an average running speed through a signalized intersection.

TRAFFIC-ACTUATED SIGNAL: A type of traffic signal that directs traffic to stop and go in accordance with the demands of traffic, as registered by the actuation of detectors.

TRIP: The movement of a person or vehicle from one location (origin) to another (destination). For example, from home to store to home is two trips, not one.

TRIP-END: One end of a trip at either the origin or destination; i.e. each trip has two trip-ends. A trip-end occurs when a person, object, or message is transferred to or from a vehicle.

TRIP GENERATION RATE: The quality of trips produced and/or attracted by a specific land use stated in terms of units such as per dwelling, per acre, and per 1,000 square feet of floor space.

TRUCK: A vehicle having dual tires on one or more axles, or having more than two axles.

UNBALANCED FLOW: Heavier traffic flow in one direction than the other. On a daily basis, most facilities have balanced flow. During the peak hours, flow is seldom balanced in an urban area.

VEHICLE MILES OF TRAVEL: A measure of the amount of usage of a section of highway, obtained by multiplying the average daily traffic by length of facility in miles.

APPENDIX B

Traffic Count Worksheets

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Inidiana Ave | DATE: 5/12/2009 | LOCATION: City of Long Beach

E-W STREET: Artesia Blvd | DAY: TUESDAY | PROJECT# 09-2018-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	1		5	3	0	6	2	94	2	5	117	1	236
7:15 AM	2		7	2	0	7	1	96	1	4	126	2	248
7:30 AM	3		12	4	0	4	2	99	9	3	152	4	292
7:45 AM	5		4	4	0	2	3	118	5	8	153	4	306
8:00 AM	4		8	3	1	4	1	108	2	9	145	3	288
8:15 AM	5		3	3	0	8	1	105	2	8	148	6	289
8:30 AM	2		1	4	0	6	2	107	2	4	136	5	269
8:45 AM	4		2	3	0	5	2	105	3	5	132	5	266
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
VOLUMES =	26	0	42	26	1	42	14	832	26	46	1109	30	2194

AM Peak Hr Begins at: 730 AM

PEAK VOLUMES =	17	0	27	14	1	18	7	430	18	28	598	17	1175
PEAK HR. FACTOR:		0.733			0.750			0.903			0.974		0.960

CONTROL: 2-Way Stop NB & SB

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Inidiana Ave | DATE: 5/12/2009 | LOCATION: City of Long Beach

E-W STREET: Artesia Blvd | DAY: TUESDAY | PROJECT# 09-2018-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	1	2	0	1	2	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	3		10	1	2	8	6	259	7	12	159	3	470
4:15 PM	4		12	1	1	9	5	267	9	10	167	2	487
4:30 PM	2		6	3	0	4	3	272	5	13	158	7	473
4:45 PM	6		16	4	1	6	8	265	4	14	163	7	494
5:00 PM	2		7	2	0	2	4	244	4	11	132	6	414
5:15 PM	0		14	2	0	3	10	278	5	14	161	7	494
5:30 PM	1		10	2	1	4	7	248	4	12	136	8	433
5:45 PM	1		10	3	1	2	6	251	2	10	142	7	435
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES =	19	0	85	18	6	38	49	2084	40	96	1218	47	3700

PM Peak Hr Begins at: 400 PM

PEAK VOLUMES =	15	0	44	9	4	27	22	1063	25	49	647	19	1924
PEAK HR. FACTOR:		0.670			0.909			0.988			0.971		0.974

CONTROL: 2-Way Stop NB & SB

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Inidiana Ave | DATE: 5/12/2009 | LOCATION: City of Long Beach

E-W STREET: Alley way | DAY: TUESDAY | PROJECT# 09-2018-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	1	0	0	0	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	9			4	1	1		0				15
7:15 AM	1	4			3	3	2		0				13
7:30 AM	0	13			0	3	1		0				17
7:45 AM	2	11			6	1	2		1				23
8:00 AM	4	9			3	4	0		0				20
8:15 AM	3	3			7	3	0		3				19
8:30 AM	0	2			3	2	2		2				11
8:45 AM	1	3			2	2	1		2				11
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL VOLUMES =	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	11	54	0	0	28	19	9	0	8	0	0	0	129

AM Peak Hr Begins at: 730 AM

PEAK VOLUMES =	9	36	0	0	16	11	3	0	4	0	0	0	79
PEAK HR. FACTOR:		0.865			0.675			0.583			0.000		0.859

CONTROL: 1-Way Stop EB

Intersection Turning Movement

Prepared by:

National Data & Surveying Services

N-S STREET: Inidiana Ave | DATE: 5/12/2009 | LOCATION: City of Long Beach

E-W STREET: Alley way | DAY: TUESDAY | PROJECT# 09-2018-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	1	0	0	1	0	0	0	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	1	10			17	1	7		2				38
4:15 PM	1	2			9	0	4		2				18
4:30 PM	3	4			7	0	2		1				17
4:45 PM	0	8			5	2	1		0				16
5:00 PM	1	3			8	1	3		0				16
5:15 PM	2	4			12	0	7		1				26
5:30 PM	0	4			5	2	1		4				16
5:45 PM	1	3			4	1	2		3				14
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES =	9	38	0	0	67	7	27	0	13	0	0	0	161

PM Peak Hr Begins at: 400 PM

PEAK VOLUMES =	5	24	0	0	38	3	14	0	5	0	0	0	89
PEAK HR. FACTOR:		0.659			0.569			0.528			0.000		0.586

CONTROL: 1-Way Stop EB

APPENDIX C

Explanation and Calculation of Intersection Capacity Utilization and Intersection Delay

EXPLANATION AND CALCULATION OF INTERSECTION CAPACITY UTILIZATION

Overview

The ability of a roadway to carry traffic is referred to as capacity. The capacity is usually greater between intersections and less at intersections because traffic flows continuously between them and only during the green phase at them. Capacity at intersections is best defined in terms of vehicles per lane per hour of green. If capacity is 1600 vehicles per lane per hour of green, and if the green phase is 50 percent of the cycle and there are three lanes, then the capacity is 1600 times 50 percent times 3 lanes, or 2400 vehicles per hour for that approach.

The technique used to compare the volume and capacity at an intersection is known as Intersection Capacity Utilization. Intersection Capacity Utilization, usually expressed as a percent, is the proportion of an hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. If an intersection is operating at 80 percent of capacity (i.e., an Intersection Capacity Utilization of 80 percent), then 20 percent of the signal cycle is not used. The signal could show red on all indications 20 percent of the time and the signal would just accommodate approaching traffic.

Intersection Capacity Utilization analysis consists of (a) determining the proportion of signal time needed to serve each conflicting movement of traffic, (b) summing the times for the movements, and (c) comparing the total time required to the total time available. For example, if for north-south traffic the northbound traffic is 1600 vehicles per hour, the southbound traffic is 1200 vehicles per hour, and the capacity of either direction is 3200 vehicles per hour, then the northbound traffic is critical and requires 1600/3200 or 50 percent of the signal time. If for east-west traffic, 30 percent of the signal time is required, then it can be seen that the Intersection Capacity Utilization is 50 plus 30, or 80 percent. When left turn arrows (left turn phasing) exist, they are incorporated into the analysis. The critical movements are usually the heavy left turn movements and the opposing through movements.

The Intersection Capacity Utilization technique is an ideal tool to quantify existing as well as future intersection operation. The impact of adding a lane can be quickly determined by examining the effect the lane has on the Intersection Capacity Utilization.

Intersection Capacity Utilization Worksheets That Follow This Discussion

The Intersection Capacity Utilization worksheet table contains the following information:

1. Peak hour turning movement volumes.

2. Number of lanes that serve each movement.

3. For right turn lanes, whether the lane is a free right turn lane, whether it has a right turn arrow, and the percent of right turns on red that are assumed.

4. Capacity assumed per lane.

5. Capacity available to serve each movement (number of lanes times capacity per lane).

6. Volume to capacity ratio for each movement.

7. Whether the movement's volume to capacity ratio is critical and adds to the Intersection Capacity Utilization value.

8. The yellow time or clearance interval assumed.

9. Adjustments for right turn movements.

10. The Intersection Capacity Utilization and Level of Service.

The Intersection Capacity Utilization Worksheet also has two graphics on the same page. These two graphics show the following:

1. Peak hour turning movement volumes.

2. Number of lanes that serve each movement.

3. The approach and exit leg volumes.

4. The two-way leg volumes.

5. An estimate of daily traffic volumes that is fairly close to actual counts and is based strictly on the peak hour leg volumes multiplied by a factor.

6. Percent of daily traffic in peak hours.

7. Percent of peak hour leg volume that is inbound versus outbound.

A more detailed discussion of Intersection Capacity Utilization and Level of Service follows.

Level of Service

Level of Service is used to describe the quality of traffic flow. Levels of Service A to C operate quite well. Level of Service C is typically the standard to which rural roadways are designed.

Level of Service D is characterized by fairly restricted traffic flow. Level of Service D is the standard to which urban roadways are typically designed. Level of Service E is the maximum volume a facility can accommodate and will result in possible stoppages of momentary duration. Level of Service F occurs when a facility is overloaded and is characterized by stop-and-go traffic with stoppages of long duration.

A description of the various Levels of Service appears at the end of the ICU description, along with the relationship between Intersection Capacity Utilization and Level of Service.

Signalized and Unsignalized Intersections

Although calculating an Intersection Capacity Utilization value for an unsignalized intersection is invalid, the presumption is that a signal can be installed and the calculation shows whether the geometrics are capable of accommodating the expected volumes with a signal. A traffic signal becomes warranted before Level of Service D is reached for a signalized intersection.

Signal Timing

The Intersection Capacity Utilization calculation assumes that a signal is properly timed. It is possible to have an Intersection Capacity Utilization well below 100 percent, yet have severe traffic congestion. This would occur if one or more movements is not getting sufficient green time to satisfy its demand, and excess green time exists on other movements. This is an operational problem that should be remedied.

Lane Capacity

Capacity is often defined in terms of roadway width; however, standard lanes have approximately the same capacity whether they are 11 or 14 feet wide. Our data indicates a typical lane, whether a through lane or a left turn lane, has a capacity of approximately 1750 vehicles per hour of green time, with nearly all locations showing a capacity greater than 1600 vehicles per hour of green per lane. Right turn lanes have a slightly lower capacity; however 1600 vehicles per hour is a valid capacity assumption for right turn lanes.

This finding is published in the August, 1978 issue of Institute of Transportation Engineers Journal in the article entitled, "Another Look at Signalized Intersection Capacity" by William Kunzman. A capacity of 1600 vehicles per hour per lane with no yellow time penalty, or 1700 vehicles per hour with a 3 or 5 percent yellow time penalty is reasonable.

Yellow Time

The yellow time can either be assumed to be completely used and no penalty applied, or it can be assumed to be only partially usable. Total yellow time accounts for approximately 10 percent of a signal cycle, and a penalty of 3 to 5 percent is reasonable.

During peak hour traffic operation the yellow times are nearly completely used. If there is no left turn phasing, the left turn vehicles completely use the yellow time. Even if there is left turn phasing, the through traffic continues to enter the intersection on the yellow until just a split second before the red.

Shared Lanes

Shared lanes occur in many locations. A shared lane is often found at the end of an off ramp where the ramp forms an intersection with the cross street. Often at a diamond interchange off ramp, there are three lanes. In the case of a diamond interchange, the middle lane is sometimes shared, and the driver can turn left, go through, or turn right from that lane.

If one assumes a three lane off ramp as described above, and if one assumes that each lane has 1600 capacity, and if one assumes that there are 1000 left turns per hour, 500 right turns per hour, and 100 through vehicles per hour, then how should one assume that the three lanes operate. There are three ways that it is done.

One way is to just assume that all 1600 vehicles (1000 plus 500 plus 100) are served simultaneously by three lanes. When this is done, the capacity is 3 times 1600 or 4800, and the amount of green time needed to serve the ramp is 1600 vehicles divided by 4800 capacity or 33.3 percent. This assumption effectively assumes perfect lane distribution between the three lanes that is not realistic. It also means a left turn can be made from the right lane.

Another way is to equally split the capacity of a shared lane and in this case to assume there are 1.33 left turn lanes, 1.33 right turn lanes, and 0.33 through lanes. With this assumption, the critical movement is the left turns and the 1000 left turns are served by a capacity of 1.33 times 1600, or 2133. The volume to capacity ratio of the critical move is 1000 divided by 2133 or 46.9 percent.

The first method results in a critical move of 33.3 percent and the second method results in a critical move of 46.9 percent. Neither is very accurate, and the difference in the calculated Level of Service will be approximately 1.5 Levels of Service (one Level of Service is 10 percent).

The way Kunzman Associates does it is to assign fractional lanes in a reasonable way. In this example, it would be assumed that there is 1.1 right turn lanes, 0.2 through lanes, and 1.7 left turn lanes. The volume to capacity ratios for each movement would be 31.3 percent for the through traffic, 28.4 percent for the right turn movement, and 36.8 percent for the left turn movement. The critical movement would be the 36.8 percent for the left turns.

Right Turn on Red

Kunzman Associates' software treats right turn lanes in one of five different ways. Each right turn lane is classified into one of five cases. The five cases are (1) free right turn lane, (2) right turn lane with separate right turn arrow, (3) standard right turn lane with no right turns on red allowed, (4) standard right turn lane with a certain percentage of right turns on red allowed, and (5) separate right turn arrow and a certain percentage of right turns on red allowed.

Free Right Turn Lane

If it is a free right turn lane, then it is given a capacity of one full lane with continuous or 100 percent green time. A Free right turn lane occurs when there is a separate approach lane for right turning vehicles, there is a separate departure lane for the right turning vehicles after they turn and are exiting the intersection, and the through cross street traffic does not interfere with the vehicles after they turn right.

Separate Right Turn Arrow

If there is a separate right turn arrow, then it is assumed that vehicles are given a green indication and can proceed on what is known as the left turn overlap.

The left turn overlap for a northbound right turn is the westbound left turn. When the left turn overlap has a green indication, the right turn lane is also given a green arrow indication. Thus, if there is a northbound right turn arrow, then it can be turned green for the period of time that the westbound left turns are proceeding.

If there are more right turns than can be accommodated during the northbound through green and the time that the northbound right turn arrow is on, then an adjustment is made to the Intersection Capacity Utilization to account for the green time that needs to be added to the northbound through green to accommodate the northbound right turns.

Standard Right Turn Lane, No Right Turns on Red

A standard right turn lane, with no right turn on red assumed, proceeds only when there is a green indication displayed for the adjacent through movement. If additional green time is needed above that amount of time, then in the Intersection Capacity Utilization calculation a right turn adjustment green time is added above the green time that is needed to serve the adjacent through movement.

Standard Right Turn Lane, With Right Turns on Red

A standard right turn lane with say 20 percent of the right turns allowed to turn right on a red indication is calculated the same as the standard right turn case where there is no right turn on red allowed, except that the right turn adjustment is reduced to account for the 20 percent of the right turning vehicles that can logically turn right on a red light. The right turns on red are never allowed to exceed the time the overlap left turns take plus the unused part of the green cycle that the cross street traffic moving from left to right has.

As an example of how 20 percent of the cars are allowed to turn right on a red indication, assume that the northbound right turn volume needs 40 percent of the signal cycle to be satisfied. To allow 20 percent of the northbound right turns to turn right on red, then during 8 percent of the signal cycle (40 percent of signal cycle times 20 percent that can turn right on red) right turns on red will be allowed if it is feasible.

For this example, assume that 15 percent of the signal cycle is green for the northbound through traffic, and that means that 15 percent of the signal cycle is available to satisfy northbound right turns. After the northbound through traffic has received its green, 25 percent of the signal cycle is still needed to satisfy the northbound right turns (40 percent of the signal cycle minus the 15 percent of the signal cycle that the northbound through used).

Assume that the westbound left turns require a green time of 6 percent of the signal cycle. This 6 percent of the signal cycle is used by northbound right turns on red. After accounting for the northbound right turns that occur on the westbound overlap left turn, 19 percent of the signal cycle is still needed for the northbound right turns (25 percent of the cycle was needed after the northbound through green time was accounted for [see above paragraph], and 6 percent was served during the westbound left turn overlap). Also, at this point 6 percent of the signal cycle has been used for northbound right turns on red, and still 2 percent more of the right turns will be allowed to occur on the red if there is unused eastbound through green time.

For purpose of this example, assume that the westbound through green is critical, and that 15 percent of the signal cycle is unused by eastbound through traffic. Thus, 2 percent more of the signal cycle can be used by the northbound right turns on red since there is 15 seconds of unused green time being given to the eastbound through traffic.

At this point, 8 percent of the signal cycle was available to serve northbound right turning vehicles on red, and 15 percent of the signal cycle was available to serve right turning vehicles on the northbound through green. So 23 percent of the signal cycle has been available for northbound right turns.

Because 40 percent of the signal cycle is needed to serve northbound right turns, there is still a need for 17 percent more of the signal cycle to be available for northbound right turns. What this means is the northbound through traffic green time is increased by 17 percent of the cycle length to serve the unserved right turn volume, and a 17 percent adjustment is added to the Intersection Capacity Utilization to account for the northbound right turns that were not served on the northbound through green time or when right turns on red were assumed.

Separate Right Turn Arrow, With Right Turns on Red

A right turn lane with a separate right turn arrow, plus a certain percentage of right turns allowed on red is calculated the same way as a standard right turn lane with a certain percentage of right turns allowed on red, except the turns which occur on the right turn arrow are not counted as part of the percentage of right turns that occur on red.

Critical Lane Method

Intersection Capacity Utilization parallels another calculation procedure known as the Critical Lane Method with one exception. Critical Lane Method dimensions capacity in terms of standardized vehicles per hour per lane. A

Critical Lane Method result of 800 vehicles per hour means that the intersection operates as though 800 vehicles were using a single lane continuously. If one assumes a lane capacity of 1600 vehicles per hour, then a Critical Lane Method calculation resulting in 800 vehicles per hour is the same as an Intersection Capacity Utilization calculation of 50 percent since 800/1600 is 50 percent. It is our opinion that the Critical Lane Method is inferior to the Intersection Capacity Utilization method simply because a statement such as "The Critical Lane Method value is 800 vehicles per hour" means little to most persons, whereas a statement such as "The Intersection Capacity Utilization is 50 percent" communicates clearly. Critical Lane Method results directly correspond to Intersection Capacity Utilization results. The correspondence is as follows, assuming a lane capacity of 1600 vehicles per hour and no clearance interval.

Critical Lane Method Result	Intersection Capacity Utilization Result
800 vehicles per hour	50 percent
960 vehicles per hour	60 percent
1120 vehicles per hour	70 percent
1280 vehicles per hour	80 percent
1440 vehicles per hour	90 percent
1600 vehicles per hour	100 percent
1760 vehicles per hour	110 percent

INTERSECTION CAPACITY UTILIZATION
LEVEL OF SERVICE DESCRIPTION[1]

Level of Service	Description	Volume to Capacity Ratio
A	Level of Service A occurs when progression is extremely favorable and vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0.600 and below
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average delay.	0.601 to 0.700
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	0.701 to 0.800
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	0.801 to 0.900
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent.	0.901 to 1.000
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs when oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	1.001 and up

[1]Source: Highway Capacity Manual Special Report 209, Transportation Research Board, National Research Council Washington D.C., 2000.

EXPLANATION AND CALCULATION OF INTERSECTION LEVEL OF SERVICE USING DELAY METHODOLOGY

The levels of service at the unsignalized and signalized intersections are calculated using the delay methodology in the 2000 Highway Capacity Manual. This methodology views an intersection as consisting of several lane groups. A lane group is a set of lanes serving a movement. If there are two northbound left turn lanes, then the lane group serving the northbound left turn movement has two lanes. Similarly, there may be three lanes in the lane group serving the northbound through movement, one lane in the lane group serving the northbound right turn movement, and so forth. It is also possible for one lane to serve two lane groups. A shared lane might result in there being 1.5 lanes in the northbound left turn lane group and 2.5 lanes in the northbound through lane group.

For each lane group, there is a capacity. That capacity is calculated by multiplying the number of lanes in the lane group times a theoretical maximum lane capacity per lane time's 12 adjustment factors.

Each of the 12 adjustment factors has a value of approximately 1.00. A value less than 1.00 is generally assigned when a less than desirable condition occurs.

The 12 adjustment factors are as follows:

1. Peak hour factor (to account for peaking within the peak hour)
2. Lane utilization factor (to account for not all lanes loading equally)
3. Lane width
4. Percent of heavy trucks
5. Approach grade
6. Parking

7. Bus stops at intersections

8. Area type (CBD or other)

9. Right turns

10. Left turns

11. Pedestrian activity

12. Signal progression

The maximum theoretical lane capacity and the 12 adjustment factors for it are all unknowns for which approximate estimates have been recommended in the 2000 Highway Capacity Manual. For the most part, the recommended values are not based on statistical analysis but rather on educated estimates. However, it is possible to use the delay method and get reasonable results as will be discussed below.

Once the lane group volume is known and the lane group capacity is known, a volume to capacity ratio can be calculated for the lane group.

With a volume to capacity ratio calculated, average delay per vehicle in a lane group can be estimated. The average delay per vehicle in a lane group is calculated using a complex formula provided by the 2000 Highway Capacity Manual, which can be simplified and described as follows:

Delay per vehicle in a lane group is a function of the following:

1. Cycle length

2. Amount of red time faced by a lane group

3. Amount of yellow time for that lane group

4. The volume to capacity ratio of the lane group

The average delay per vehicle for each lane group is calculated, and eventually an overall average delay for all vehicles entering the intersection is calculated. This average delay per vehicle is then used to judge Level of Service. The Level of Services are defined in the table that follows this discussion.

Experience has shown that when a maximum lane capacity of 1,900 vehicles per hour is used (as recommended in the 2000 Highway Capacity Manual), little or no yellow time penalty is used, and none of the 12 penalty factors are applied, calculated delay is realistic. The delay calculation for instance assumes that yellow time is totally unused. Yet experience shows that most of the yellow time is used.

An idiosyncrasy of the delay methodology is that it is possible to add traffic to an intersection and reduce the average total delay per vehicle. If the average total delay is 30 seconds per vehicle for all vehicles traveling through an intersection, and traffic is added to a movement that has an average total delay of 15 seconds per vehicle, then the overall average total delay is reduced.

The delay calculation for a lane group is based on a concept that the delay is a function of the amount of unused capacity available. As the volume approaches capacity and there is no more unused capacity available, then the delay rapidly increases. Delay is not proportional to volume, but rather increases rapidly as the unused capacity approaches zero.

Because delay is not linearly related to volumes, the delay does not reflect how close an intersection is to overloading. If an intersection is operating at Level of Service C and has an average total delay of 18 seconds per vehicle, you know very little as to what percent the traffic can increase before Level of Service E is reached.

LEVEL OF SERVICE DESCRIPTION[1]

Level of Service	Description	Average Total Delay Per Vehicle (Seconds)	
		Signalized	Unsignalized
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.00	0 to 10.00
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for Level of Service A, causing higher levels of average total delay.	10.01 to 20.00	10.01 to 15.00
C	Level of Service C generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.01 to 35.00	15.01 to 25.00
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.01 to 55.00	25.01 to 35.00
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.01 to 80.00	35.01 to 50.00
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with oversaturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.01 and up	50.01 and up

[1] Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 2000.

Existing

Artesia Boulevard Senior Housing
Existing
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Base Volume Alternative)

Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)

Average Delay (sec/veh): 1.6 Worst Case Level Of Service: C[17.3]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0 1! 0 0			0 0 1! 0 0			1 0 2 0 1			1 0 2 0 1		
Volume Module:												
Base Vol:	17	1	27	14	1	18	7	430	18	28	598	17
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	17	1	27	14	1	18	7	430	18	28	598	17
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90	0.97	0.97	0.97
PHF Volume:	23	1	37	19	1	24	8	476	20	29	614	17
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	23	1	37	19	1	24	8	476	20	29	614	17
Critical Gap Module:												
Critical Gp:	7.5	6.5	6.9	7.5	6.5	6.9	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	857	1181	238	926	1183	307	631	xxxx	xxxxx	496	xxxx	xxxxx
Potent Cap.:	254	192	769	227	191	695	961	xxxx	xxxxx	1078	xxxx	xxxxx
Move Cap.:	238	185	769	209	184	695	961	xxxx	xxxxx	1078	xxxx	xxxxx
Volume/Cap:	0.10	0.01	0.05	0.09	0.01	0.03	0.01	xxxx	xxxx	0.03	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.1	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.8	xxxx	xxxxx	8.4	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	402	xxxxx	xxxx	336	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.5	xxxxx	xxxxx	0.4	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	15.6	xxxxx	xxxxx	17.3	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	C	*	*	C	*	*	*	*	*	*	*
ApproachDel:		15.6			17.3			xxxxxx			xxxxxx	
ApproachLOS:		C			C			*			*	

Note: Queue reported is the number of cars per lane.

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---------------------------------------------------------------------------------
                    Artesia Boulevard Senior Housing
                                Existing
                           Evening Peak Hour
---------------------------------------------------------------------------------

                   Level Of Service Computation Report
         2000 HCM Unsignalized Method (Base Volume Alternative)
*********************************************************************************
Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)
*********************************************************************************
Average Delay (sec/veh):       3.0       Worst Case Level Of Service: E[ 43.9]
*********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:         0  0  1! 0  0    0  0  1! 0  0    1  0  2  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       15    1    44     9    4    27    22 1063    25    49  647    19
Growth Adj:   1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    15    1    44     9    4    27    22 1063    25    49  647    19
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.67 0.67  0.67  0.91 0.91  0.91  0.99 0.99  0.99  0.97 0.97  0.97
PHF Volume:     22    1    66    10    4    30    22 1076    25    50  666    20
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    22    1    66    10    4    30    22 1076    25    50  666    20
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:   3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1557 1907   538  1350 1913   333   686 xxxx xxxxx  1101 xxxx xxxxx
Potent Cap.:    78   69   493   111   69   668   917 xxxx xxxxx   641 xxxx xxxxx
Move Cap.:      65   62   493    87   62   668   917 xxxx xxxxx   641 xxxx xxxxx
Volume/Cap:   0.34 0.02  0.13  0.11 0.07  0.04  0.02 xxxx  xxxx  0.08 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.1 xxxx xxxxx   0.3 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.0 xxxx xxxxx  11.1 xxxx xxxxx
LOS by Move:     *    *     *     *    *     *     A    *     *     B    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx  179 xxxxx  xxxx  192 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  2.5 xxxxx xxxxx  0.9 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 43.9 xxxxx xxxxx 29.3 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:      *    E     *     *    D     *     *    *     *     *    *     *
ApproachDel:        43.9             29.3            xxxxxx           xxxxxx
ApproachLOS:           E                D                *                *
*********************************************************************************
Note: Queue reported is the number of cars per lane.
*********************************************************************************
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--------------------------------------------------------------------------------
                    Artesia Boulevard Senior Housing
                                Existing
                           Morning Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
          2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)
********************************************************************************
Average Delay (sec/veh):      1.7      Worst Case Level Of Service: A[  8.7]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  1  0  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       9   36     0     0   16    11     3    0     4     0    0     0
Growth Adj:  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
Initial Bse:    9   36     0     0   16    11     3    0     4     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.87 0.87  0.87  0.68 0.68  0.68  0.58 0.58  0.58  1.00 1.00  1.00
PHF Volume:    10   42     0     0   24    16     5    0     7     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   10   42     0     0   24    16     5    0     7     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   40 xxxx xxxxx  xxxx xxxx xxxxx    94   94    32  xxxx xxxx xxxxx
Potent Cap.: 1583 xxxx xxxxx  xxxx xxxx xxxxx   910  800  1048  xxxx xxxx xxxxx
Move Cap.:   1583 xxxx xxxxx  xxxx xxxx xxxxx   906  794  1048  xxxx xxxx xxxxx
Volume/Cap:  0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.01  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  982 xxxxx  xxxx xxxx xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.0 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  8.7 xxxxx xxxxx xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    A     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx              8.7            xxxxxx
ApproachLOS:        *                *                 A                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                      Artesia Boulevard Senior Housing
                                 Existing
                             Evening Peak Hour
--------------------------------------------------------------------------------

                     Level Of Service Computation Report
            2000 HCM Unsignalized Method (Base Volume Alternative)
********************************************************************************
Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)
********************************************************************************
Average Delay (sec/veh):       2.5      Worst Case Level Of Service: A[  9.1]
********************************************************************************
Approach:     North Bound      South Bound       East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:       0  1  0  0  0   0  0  0  1  0   0  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       5   24    0     0   38    3    14    0    5     0    0    0
Growth Adj:  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
Initial Bse:    5   24    0     0   38    3    14    0    5     0    0    0
User Adj:    1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:     0.66 0.66 0.66  0.57 0.57 0.57  0.53 0.53 0.53  1.00 1.00 1.00
PHF Volume:     8   36    0     0   67    5    27    0    9     0    0    0
Reduct Vol:     0    0    0     0    0    0     0    0    0     0    0    0
FinalVolume:    8   36    0     0   67    5    27    0    9     0    0    0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5  6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0  3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   72 xxxx xxxxx  xxxx xxxx xxxxx   121  121   69  xxxx xxxx xxxxx
Potent Cap.: 1541 xxxx xxxxx  xxxx xxxx xxxxx   879  773  999  xxxx xxxx xxxxx
Move Cap.:   1541 xxxx xxxxx  xxxx xxxx xxxxx   876  769  999  xxxx xxxx xxxxx
Volume/Cap:  0.00 xxxx  xxxx  xxxx xxxx  xxxx  0.03 0.00 0.01  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *    *     *    *    *     *    *    *     *    *    *
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  905 xxxxx  xxxx xxxx xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  9.1 xxxxx xxxxx xxxx xxxxx
Shared LOS:     A    *    *     *    *    *     *    A    *     *    *    *
ApproachDel:     xxxxxx           xxxxxx            9.1            xxxxxx
ApproachLOS:        *                *               A                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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Existing Plus Ambient Growth

Artesia Boulevard Senior Housing
Existing Plus Ambient Growth
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)

Average Delay (sec/veh): 1.6 Worst Case Level Of Service: C[17.8]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Stop Sign			Stop Sign			Uncontrolled			Uncontrolled	
Rights:		Include			Include			Include			Include	
Lanes:	0 0 1! 0 0			0 0 1! 0 0			1 0 2 0 1			1 0 2 0 1		
Volume Module:												
Base Vol:	17	1	27	14	1	18	7	430	18	28	598	17
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	17	1	28	14	1	18	7	439	18	29	610	17
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	17	1	28	14	1	18	7	439	18	29	610	17
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90	0.97	0.97	0.97
PHF Volume:	24	1	38	19	1	24	8	486	20	29	626	18
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	24	1	38	19	1	24	8	486	20	29	626	18
Critical Gap Module:												
Critical Gp:	7.5	6.5	6.9	7.5	6.5	6.9	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	874	1204	243	944	1207	313	644	xxxx	xxxxx	506	xxxx	xxxxx
Potent Cap.:	247	186	764	220	185	689	951	xxxx	xxxxx	1069	xxxx	xxxxx
Move Cap.:	231	179	764	202	178	689	951	xxxx	xxxxx	1069	xxxx	xxxxx
Volume/Cap:	0.10	0.01	0.05	0.09	0.01	0.04	0.01	xxxx	xxxx	0.03	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.1	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.8	xxxx	xxxxx	8.5	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	392	xxxxx	xxxx	327	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.6	xxxxx	xxxxx	0.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	15.9	xxxxx	xxxxx	17.8	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	C	*	*	C	*	*	*	*	*	*	*
ApproachDel:		15.9			17.8			xxxxxx			xxxxxx	
ApproachLOS:		C			C			*			*	

Note: Queue reported is the number of cars per lane.

Artesia Boulevard Senior Housing
Existing Plus Ambient Growth
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)

Average Delay (sec/veh): 3.2 Worst Case Level Of Service: E[48.5]

Approach:	North Bound	South Bound	East Bound	West Bound
Control:	Stop Sign	Stop Sign	Uncontrolled	Uncontrolled
Rights:	Include	Include	Include	Include
Lanes:	0 0 1! 0 0	0 0 1! 0 0	1 0 2 0 1	1 0 2 0 1

Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Volume Module:												
Base Vol:	15	1	44	9	4	27	22	1063	25	49	647	19
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	15	1	45	9	4	28	22	1084	26	50	660	19
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	15	1	45	9	4	28	22	1084	26	50	660	19
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.67	0.67	0.67	0.91	0.91	0.91	0.99	0.99	0.99	0.97	0.97	0.97
PHF Volume:	23	2	67	10	4	30	23	1097	26	51	680	20
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	23	2	67	10	4	30	23	1097	26	51	680	20
Critical Gap Module:												
Critical Gp:	7.5	6.5	6.9	7.5	6.5	6.9	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1588	1945	549	1377	1951	340	700	xxxx	xxxxx	1123	xxxx	xxxxx
Potent Cap.:	74	66	485	106	65	662	907	xxxx	xxxxx	629	xxxx	xxxxx
Move Cap.:	61	59	485	82	58	662	907	xxxx	xxxxx	629	xxxx	xxxxx
Volume/Cap:	0.37	0.03	0.14	0.12	0.08	0.05	0.03	xxxx	xxxx	0.08	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	0.3	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.1	xxxx	xxxxx	11.2	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	B	*	*
Movement:	LT	- LTR -	RT	LT	- LTR -	RT	LT	- LTR -	RT	LT	- LTR -	RT
Shared Cap.:	xxxx	170	xxxxx	xxxx	183	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	2.7	xxxxx	xxxxx	0.9	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	48.5	xxxxx	xxxxx	31.0	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	E	*	*	D	*	*	*	*	*	*	*
ApproachDel:		48.5			31.0			xxxxxx			xxxxxx	
ApproachLOS:		E			D			*			*	

Note: Queue reported is the number of cars per lane.

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--------------------------------------------------------------------------------
                     Artesia Boulevard Senior Housing
                       Existing Plus Ambient Growth
                            Morning Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)
********************************************************************************
Average Delay (sec/veh):       1.7       Worst Case Level Of Service: A[  8.7]
********************************************************************************
Approach:      North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled      Uncontrolled        Stop Sign         Stop Sign
Rights:          Include           Include           Include           Include
Lanes:        0  1  0  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        9   36     0     0   16    11     3    0     4     0    0     0
Growth Adj:   1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02
Initial Bse:     9   37     0     0   16    11     3    0     4     0    0     0
Added Vol:       0    0     0     0    0     0     0    0     0     0    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:     9   37     0     0   16    11     3    0     4     0    0     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.87 0.87  0.87  0.68 0.68  0.68  0.58 0.58  0.58  1.00 1.00  1.00
PHF Volume:     11   42     0     0   24    17     5    0     7     0    0     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    11   42     0     0   24    17     5    0     7     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:    41 xxxx xxxxx  xxxx xxxx xxxxx    96   96    32  xxxx xxxx xxxxx
Potent Cap.:  1582 xxxx xxxxx  xxxx xxxx xxxxx   908  798  1047  xxxx xxxx xxxxx
Move Cap.:    1582 xxxx xxxxx  xxxx xxxx xxxxx   903  792  1047  xxxx xxxx xxxxx
Volume/Cap:   0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.01  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:     0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:   7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  980 xxxxx  xxxx xxxx xxxxx
SharedQueue:   0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.0 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:   7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  8.7 xxxxx xxxxx xxxx xxxxx
Shared LOS:      A    *     *     *    *     *     *    A     *     *    *     *
ApproachDel:      xxxxxx            xxxxxx              8.7            xxxxxx
ApproachLOS:         *                 *                 A                 *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                     Artesia Boulevard Senior Housing
                       Existing Plus Ambient Growth
                            Evening Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)
********************************************************************************
Average Delay (sec/veh):      2.5      Worst Case Level Of Service: A[  9.2]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:        0  1  0  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        5   24    0      0   38    3     14    0    5      0    0    0
Growth Adj:   1.02 1.02 1.02   1.02 1.02 1.02   1.02 1.02 1.02   1.02 1.02 1.02
Initial Bse:     5   24    0      0   39    3     14    0    5      0    0    0
Added Vol:       0    0    0      0    0    0      0    0    0      0    0    0
PasserByVol:     0    0    0      0    0    0      0    0    0      0    0    0
Initial Fut:     5   24    0      0   39    3     14    0    5      0    0    0
User Adj:     1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00
PHF Adj:      0.66 0.66 0.66   0.57 0.57 0.57   0.53 0.53 0.53   1.00 1.00 1.00
PHF Volume:      8   37    0      0   68    5     27    0   10      0    0    0
Reduct Vol:      0    0    0      0    0    0      0    0    0      0    0    0
FinalVolume:     8   37    0      0   68    5     27    0   10      0    0    0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:    73 xxxx xxxxx  xxxx xxxx xxxxx   123  123    71  xxxx xxxx xxxxx
Potent Cap.:  1539 xxxx xxxxx  xxxx xxxx xxxxx   876  771   997  xxxx xxxx xxxxx
Move Cap.:    1539 xxxx xxxxx  xxxx xxxx xxxxx   873  767   997  xxxx xxxx xxxxx
Volume/Cap:   0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.03 0.00  0.01  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:     0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  903 xxxxx  xxxx xxxx xxxxx
SharedQueue:   0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  9.2 xxxxx xxxxx xxxx xxxxx
Shared LOS:      A    *     *     *    *     *     *    A     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx              9.2            xxxxxx
ApproachLOS:        *                *                 A                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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Existing Plus Ambient Growth Plus Project

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--------------------------------------------------------------------------------
                    Artesia Boulevard Senior Housing
               Existing Plus Ambient Growth Plus Project
                          Morning Peak Hour
--------------------------------------------------------------------------------
                   Level Of Service Computation Report
       2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Project Access (NS) at Artesia Boulevard (EW)
********************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: A[  9.7]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  1    0  0  0  0  0    0  0  1  1  0    0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0     0    0     0     0  455     0     0  633     0
Growth Adj:  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02
Initial Bse:    0    0     0     0    0     0     0  464     0     0  646     0
Added Vol:      0    0     1     0    0     0     0    0     1     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     1     0    0     0     0  464     1     0  646     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0    0     1     0    0     0     0  489     1     0  680     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0    0     1     0    0     0     0  489     1     0  680     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx   6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx   245  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx   762  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx   762  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  0.00  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx   0.0  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx   9.7 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     A     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:        9.7           xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         A               *                *                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
```

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-------------------------------------------------------------------------------
                     Artesia Boulevard Senior Housing
                Existing Plus Ambient Growth Plus Project
                            Evening Peak Hour
-------------------------------------------------------------------------------
                      Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
*******************************************************************************
Intersection #1 Project Access (NS) at Artesia Boulevard (EW)
*******************************************************************************
Average Delay (sec/veh):       0.0       Worst Case Level Of Service: B[ 13.0]
*******************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:           Include          Include          Include          Include
Lanes:        0  0  0  0  1   0  0  0  0  0   0  0  1  1  0   0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0    0     0    0    0     0    0 1110     0    0  689     0
Growth Adj:   1.02 1.02  1.02 1.02 1.02  1.02 1.02 1.02  1.02 1.02 1.02  1.02
Initial Bse:     0    0     0    0    0     0    0 1132     0    0  703     0
Added Vol:       0    0     1    0    0     0    0    0     2    0    0     0
PasserByVol:     0    0     0    0    0     0    0    0     0    0    0     0
Initial Fut:     0    0     1    0    0     0    0 1132     2    0  703     0
User Adj:     1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00
PHF Adj:      0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95 0.95 0.95  0.95
PHF Volume:      0    0     1    0    0     0    0 1192     2    0  740     0
Reduct Vol:      0    0     0    0    0     0    0    0     0    0    0     0
FinalVolume:     0    0     1    0    0     0    0 1192     2    0  740     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx    6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx    3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx   597  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx   451  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx   451  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  0.00  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx   0.0  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx  13.0 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     B    *    *     *    *    *     *    *    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:      *    *     *    *    *     *    *    *     *    *    *     *
ApproachDel:        13.0            xxxxxx           xxxxxx           xxxxxx
ApproachLOS:          B                *                *                *
*******************************************************************************
Note: Queue reported is the number of cars per lane.
*******************************************************************************
```

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--------------------------------------------------------------------------------
                     Artesia Boulevard Senior Housing
                 Existing Plus Ambient Growth Plus Project
                             Morning Peak Hour
--------------------------------------------------------------------------------
                    Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)
********************************************************************************
Average Delay (sec/veh):       1.6      Worst Case Level Of Service: C[ 17.8]
********************************************************************************
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled      Uncontrolled
Rights:          Include          Include          Include           Include
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  2  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      17    1    27    14    1    18     7  430    18    28  598    17
Growth Adj:  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02
Initial Bse:   17    1    28    14    1    18     7  439    18    29  610    17
Added Vol:      0    0     0     0    0     0     0    1     0     1    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   17    1    28    14    1    18     7  440    18    30  610    17
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.73 0.73  0.73  0.75 0.75  0.75  0.90 0.90  0.90  0.97 0.97  0.97
PHF Volume:    24    1    38    19    1    24     8  487    20    30  626    18
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   24    1    38    19    1    24     8  487    20    30  626    18
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  877 1207   243   947 1210   313   644 xxxx xxxxx   507 xxxx xxxxx
Potent Cap.:  246  185   763   219  184   689   951 xxxx xxxxx  1068 xxxx xxxxx
Move Cap.:    229  178   763   201  177   689   951 xxxx xxxxx  1068 xxxx xxxxx
Volume/Cap:  0.10 0.01  0.05  0.09 0.01  0.04  0.01 xxxx  xxxx  0.03 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.0 xxxx xxxxx   0.1 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.8 xxxx xxxxx   8.5 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     A    *     *
Movement:    LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx  391 xxxxx  xxxx  325 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.6 xxxxx xxxxx  0.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 16.0 xxxxx xxxxx 17.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    C     *     *    C     *     *    *     *     *    *     *
ApproachDel:        16.0              17.8            xxxxxx            xxxxxx
ApproachLOS:          C                 C                *                 *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                       Artesia Boulevard Senior Housing
                  Existing Plus Ambient Growth Plus Project
                              Evening Peak Hour
--------------------------------------------------------------------------------
                      Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)
********************************************************************************
Average Delay (sec/veh):       3.3       Worst Case Level Of Service: E[ 49.3]
********************************************************************************
Approach:      North Bound       South Bound        East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign         Stop Sign        Uncontrolled      Uncontrolled
Rights:          Include           Include           Include           Include
Lanes:        0  0  1! 0  0    0  0  1! 0  0    1  0  2  0  1    1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15     1    44     9     4    27    22  1063    25    49   647    19
Growth Adj:  1.02  1.02  1.02  1.02  1.02  1.02  1.02  1.02  1.02  1.02  1.02  1.02
Initial Bse:   15     1    45     9     4    28    22  1084    26    50   660    19
Added Vol:      0     0     0     0     0     0     0     1     0     2     0     0
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:   15     1    45     9     4    28    22  1085    26    52   660    19
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.67  0.67  0.67  0.91  0.91  0.91  0.99  0.99  0.99  0.97  0.97  0.97
PHF Volume:    23     2    67    10     4    30    23  1098    26    54   680    20
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
FinalVolume:   23     2    67    10     4    30    23  1098    26    54   680    20
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.5   6.5   6.9   7.5   6.5   6.9   4.1  xxxx xxxxx   4.1  xxxx xxxxx
FollowUpTim:  3.5   4.0   3.3   3.5   4.0   3.3   2.2  xxxx xxxxx   2.2  xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1593  1951   549  1382  1956   340   700  xxxx xxxxx  1124  xxxx xxxxx
Potent Cap.:   73    65   485   105    65   662   907  xxxx xxxxx   629  xxxx xxxxx
Move Cap.:     60    58   485    81    58   662   907  xxxx xxxxx   629  xxxx xxxxx
Volume/Cap:  0.38  0.03  0.14  0.12  0.08  0.05  0.03  xxxx  xxxx  0.09  xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx  xxxx xxxxx  xxxx  xxxx xxxxx   0.1  xxxx xxxxx   0.3  xxxx xxxxx
Control Del:xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx   9.1  xxxx xxxxx  11.3  xxxx xxxxx
LOS by Move:    *     *     *     *     *     *     A     *     *     B     *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx   168 xxxxx  xxxx   181 xxxxx  xxxx  xxxx xxxxx  xxxx  xxxx xxxxx
SharedQueue:xxxxx   2.8 xxxxx xxxxx   0.9 xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shrd ConDel:xxxxx  49.3 xxxxx xxxxx  31.3 xxxxx xxxxx  xxxx xxxxx xxxxx  xxxx xxxxx
Shared LOS:     *     E     *     *     D     *     *     *     *     *     *     *
ApproachDel:        49.3              31.3             xxxxxx            xxxxxx
ApproachLOS:          E                 D                 *                 *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                   Artesia Boulevard Senior Housing
             Existing Plus Ambient Growth Plus Project
                          Morning Peak Hour
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
       2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)
********************************************************************************
Average Delay (sec/veh):       1.8       Worst Case Level Of Service: A[  8.8]
********************************************************************************
Approach:       North Bound      South Bound       East Bound        West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled       Stop Sign         Stop Sign
Rights:           Include          Include          Include           Include
Lanes:        0  1  0  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       9   36     0     0   16    11     3    0     4     0    0     0
Growth Adj:  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02
Initial Bse:    9   37     0     0   16    11     3    0     4     0    0     0
Added Vol:      0    0     0     0    0     1     1    0     0     0    0     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    9   37     0     0   16    12     4    0     4     0    0     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.87 0.87  0.87  0.68 0.68  0.68  0.58 0.58  0.58  1.00 1.00  1.00
PHF Volume:    11   42     0     0   24    18     7    0     7     0    0     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   11   42     0     0   24    18     7    0     7     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:  2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:   42 xxxx xxxxx  xxxx xxxx xxxxx    97   97    33  xxxx xxxx xxxxx
Potent Cap.: 1580 xxxx xxxxx  xxxx xxxx xxxxx   907  797  1046  xxxx xxxx xxxxx
Move Cap.:   1580 xxxx xxxxx  xxxx xxxx xxxxx   903  792  1046  xxxx xxxx xxxxx
Volume/Cap:  0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.01  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:    0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    A    *     *     *    *     *     *    *     *     *    *     *
Movement:     LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  969 xxxxx  xxxx xxxx xxxxx
SharedQueue:  0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.0 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:  7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  8.8 xxxxx xxxxx xxxx xxxxx
Shared LOS:     A    *     *     *    *     *     *    A     *     *    *     *
ApproachDel:     xxxxxx           xxxxxx              8.8           xxxxxx
ApproachLOS:        *                *                 A               *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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--------------------------------------------------------------------------------
                      Artesia Boulevard Senior Housing
                 Existing Plus Ambient Growth Plus Project
                            Evening Peak Hour
--------------------------------------------------------------------------------
                     Level Of Service Computation Report
          2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)
********************************************************************************
Average Delay (sec/veh):       2.6       Worst Case Level Of Service: A[  9.2]
********************************************************************************
Approach:        North Bound      South Bound       East Bound       West Bound
Movement:       L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:            Include          Include          Include          Include
Lanes:          0  1  0  0  0    0  0  0  1  0    0  0  1! 0  0    0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:          5   24    0      0   38    3     14    0    5      0    0    0
Growth Adj:     1.02 1.02 1.02   1.02 1.02 1.02   1.02 1.02 1.02   1.02 1.02 1.02
Initial Bse:       5   24    0      0   39    3     14    0    5      0    0    0
Added Vol:         0    0    0      0    0    2      1    0    0      0    0    0
PasserByVol:       0    0    0      0    0    0      0    0    0      0    0    0
Initial Fut:       5   24    0      0   39    5     15    0    5      0    0    0
User Adj:       1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00   1.00 1.00 1.00
PHF Adj:        0.66 0.66 0.66   0.57 0.57 0.57   0.53 0.53 0.53   1.00 1.00 1.00
PHF Volume:        8   37    0      0   68    9     29    0   10      0    0    0
Reduct Vol:        0    0    0      0    0    0      0    0    0      0    0    0
FinalVolume:       8   37    0      0   68    9     29    0   10      0    0    0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:     4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5  6.2 xxxxx xxxx xxxxx
FollowUpTim:     2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0  3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:      77 xxxx xxxxx  xxxx xxxx xxxxx   125  125   73  xxxx xxxx xxxxx
Potent Cap.:    1535 xxxx xxxxx  xxxx xxxx xxxxx   874  769  995  xxxx xxxx xxxxx
Move Cap.:      1535 xxxx xxxxx  xxxx xxxx xxxxx   871  765  995  xxxx xxxx xxxxx
Volume/Cap:     0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.03 0.00 0.01  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:       0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:     7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:       A    *    *     *    *    *      *    *    *      *    *    *
Movement:        LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.:    xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  899 xxxxx  xxxx xxxx xxxxx
SharedQueue:     0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:     7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  9.2 xxxxx xxxxx xxxx xxxxx
Shared LOS:        A    *    *     *    *    *      *    A    *      *    *    *
ApproachDel:        xxxxxx           xxxxxx             9.2             xxxxxx
ApproachLOS:           *                *                A                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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Year 2011 Without Project

Artesia Boulevard Senior Housing
Year 2011 Without Project
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)

Average Delay (sec/veh): 1.6 Worst Case Level Of Service: C[18.0]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Uncontrolled			Uncontrolled		
Rights:	Include			Include			Include			Include		
Lanes:	0 0	1!	0 0	0 0	1!	0 0	1 0	2	0 1	1 0	2	0 1
Volume Module:												
Base Vol:	17	1	27	14	1	18	7	430	18	28	598	17
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	17	1	28	14	1	18	7	439	18	29	610	17
Added Vol:	0	0	0	0	0	0	0	11	0	0	7	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	17	1	28	14	1	18	7	450	18	29	617	17
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.73	0.73	0.73	0.75	0.75	0.75	0.90	0.90	0.90	0.97	0.97	0.97
PHF Volume:	24	1	38	19	1	24	8	498	20	29	633	18
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	24	1	38	19	1	24	8	498	20	29	633	18
Critical Gap Module:												
Critical Gp:	7.5	6.5	6.9	7.5	6.5	6.9	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	890	1224	249	958	1226	317	651	xxxx	xxxxx	518	xxxx	xxxxx
Potent Cap.:	241	181	757	215	180	685	945	xxxx	xxxxx	1058	xxxx	xxxxx
Move Cap.:	224	174	757	198	174	685	945	xxxx	xxxxx	1058	xxxx	xxxxx
Volume/Cap:	0.11	0.01	0.05	0.10	0.01	0.04	0.01	xxxx	xxxx	0.03	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.0	xxxx	xxxxx	0.1	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	8.8	xxxx	xxxxx	8.5	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	A	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	384	xxxxx	xxxx	321	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	0.6	xxxxx	xxxxx	0.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	16.2	xxxxx	xxxxx	18.0	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	C	*	*	C	*	*	*	*	*	*	*
ApproachDel:		16.2			18.0			xxxxxx			xxxxxx	
ApproachLOS:		C			C			*			*	

Note: Queue reported is the number of cars per lane.

Artesia Boulevard Senior Housing
Year 2011 Without Project
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)

Average Delay (sec/veh): 3.5 Worst Case Level Of Service: F[54.1]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:		Stop Sign			Stop Sign			Uncontrolled			Uncontrolled	
Rights:		Include			Include			Include			Include	
Lanes:	0 0 1! 0 0			0 0 1! 0 0			1 0 2 0 1			1 0 2 0 1		
Volume Module:												
Base Vol:	15	1	44	9	4	27	22	1063	25	49	647	19
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	15	1	45	9	4	28	22	1084	26	50	660	19
Added Vol:	0	0	0	0	0	0	0	25	0	0	28	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	15	1	45	9	4	28	22	1109	26	50	688	19
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.67	0.67	0.67	0.91	0.91	0.91	0.99	0.99	0.99	0.97	0.97	0.97
PHF Volume:	23	2	67	10	4	30	23	1123	26	51	708	20
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	23	2	67	10	4	30	23	1123	26	51	708	20
Critical Gap Module:												
Critical Gp:	7.5	6.5	6.9	7.5	6.5	6.9	4.1	xxxx	xxxxx	4.1	xxxx	xxxxx
FollowUpTim:	3.5	4.0	3.3	3.5	4.0	3.3	2.2	xxxx	xxxxx	2.2	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	1628	2000	561	1419	2005	354	728	xxxx	xxxxx	1149	xxxx	xxxxx
Potent Cap.:	69	61	476	99	60	648	884	xxxx	xxxxx	616	xxxx	xxxxx
Move Cap.:	57	54	476	76	54	648	884	xxxx	xxxxx	616	xxxx	xxxxx
Volume/Cap:	0.40	0.03	0.14	0.13	0.08	0.05	0.03	xxxx	xxxx	0.08	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	0.1	xxxx	xxxxx	0.3	xxxx	xxxxx
Control Del:	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	9.2	xxxx	xxxxx	11.4	xxxx	xxxxx
LOS by Move:	*	*	*	*	*	*	A	*	*	B	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	160	xxxxx	xxxx	171	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	xxxxx	3.0	xxxxx	xxxxx	1.0	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	xxxxx	54.1	xxxxx	xxxxx	33.5	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	*	F	*	*	D	*	*	*	*	*	*	*
ApproachDel:		54.1			33.5			xxxxxx			xxxxxx	
ApproachLOS:		F			D			*			*	

Note: Queue reported is the number of cars per lane.

Artesia Boulevard Senior Housing
Year 2011 Without Project
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)

Average Delay (sec/veh): 1.7 Worst Case Level Of Service: A[8.7]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 1 0 0 0			0 0 0 1 0			0 0 1! 0 0			0 0 0 0 0		
Volume Module:												
Base Vol:	9	36	0	0	16	11	3	0	4	0	0	0
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	9	37	0	0	16	11	3	0	4	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	9	37	0	0	16	11	3	0	4	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.87	0.87	0.87	0.68	0.68	0.68	0.58	0.58	0.58	1.00	1.00	1.00
PHF Volume:	11	42	0	0	24	17	5	0	7	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	11	42	0	0	24	17	5	0	7	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	41	xxxx	xxxxx	xxxx	xxxx	xxxxx	96	96	32	xxxx	xxxx	xxxxx
Potent Cap.:	1582	xxxx	xxxxx	xxxx	xxxx	xxxxx	908	798	1047	xxxx	xxxx	xxxxx
Move Cap.:	1582	xxxx	xxxxx	xxxx	xxxx	xxxxx	903	792	1047	xxxx	xxxx	xxxxx
Volume/Cap:	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	0.01	0.00	0.01	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	980	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.0	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	7.3	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	8.7	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:		xxxxxx			xxxxxx			8.7			xxxxxx	
ApproachLOS:		*			*			A			*	

Note: Queue reported is the number of cars per lane.

Artesia Boulevard Senior Housing
Year 2011 Without Project
Evening Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)

Average Delay (sec/veh): 2.5   Worst Case Level Of Service: A[9.2]

Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Uncontrolled			Uncontrolled			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Lanes:	0 1 0 0 0			0 0 0 1 0			0 0 1! 0 0			0 0 0 0 0		
Volume Module:												
Base Vol:	5	24	0	0	38	3	14	0	5	0	0	0
Growth Adj:	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Initial Bse:	5	24	0	0	39	3	14	0	5	0	0	0
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	5	24	0	0	39	3	14	0	5	0	0	0
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.66	0.66	0.66	0.57	0.57	0.57	0.53	0.53	0.53	1.00	1.00	1.00
PHF Volume:	8	37	0	0	68	5	27	0	10	0	0	0
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
FinalVolume:	8	37	0	0	68	5	27	0	10	0	0	0
Critical Gap Module:												
Critical Gp:	4.1	xxxx	xxxxx	xxxxx	xxxx	xxxxx	6.4	6.5	6.2	xxxxx	xxxx	xxxxx
FollowUpTim:	2.2	xxxx	xxxxx	xxxxx	xxxx	xxxxx	3.5	4.0	3.3	xxxxx	xxxx	xxxxx
Capacity Module:												
Cnflict Vol:	73	xxxx	xxxxx	xxxx	xxxx	xxxxx	123	123	71	xxxx	xxxx	xxxxx
Potent Cap.:	1539	xxxx	xxxxx	xxxx	xxxx	xxxxx	876	771	997	xxxx	xxxx	xxxxx
Move Cap.:	1539	xxxx	xxxxx	xxxx	xxxx	xxxxx	873	767	997	xxxx	xxxx	xxxxx
Volume/Cap:	0.01	xxxx	xxxx	xxxx	xxxx	xxxx	0.03	0.00	0.01	xxxx	xxxx	xxxx
Level Of Service Module:												
2Way95thQ:	0.0	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx
Control Del:	7.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	xxxx	xxxxx
LOS by Move:	A	*	*	*	*	*	*	*	*	*	*	*
Movement:	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT	LT	LTR	RT
Shared Cap.:	xxxx	xxxx	xxxxx	xxxx	xxxx	xxxxx	xxxx	903	xxxxx	xxxx	xxxx	xxxxx
SharedQueue:	0.0	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	0.1	xxxxx	xxxxx	xxxx	xxxxx
Shrd ConDel:	7.4	xxxx	xxxxx	xxxxx	xxxx	xxxxx	xxxxx	9.2	xxxxx	xxxxx	xxxx	xxxxx
Shared LOS:	A	*	*	*	*	*	*	A	*	*	*	*
ApproachDel:	xxxxxx			xxxxxx			9.2			xxxxxx		
ApproachLOS:	*			*			A			*		

Note: Queue reported is the number of cars per lane.

Year 2011 With Project

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                     Artesia Boulevard Senior Housing
                          Year 2011 With Project
                            Morning Peak Hour
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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Project Access (NS) at Artesia Boulevard (EW)
********************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: A[  9.8]
********************************************************************************
Approach:       North Bound      South Bound      East Bound       West Bound
Movement:      L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:         0  0  0  0  1    0  0  0  0  0    0  0  1  1  0    0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        0    0     0     0    0     0     0  455     0     0  633     0
Growth Adj:   1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02
Initial Bse:     0    0     0     0    0     0     0  464     0     0  646     0
Added Vol:       0    0     1     0    0     0     0   11     1     0    7     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:     0    0     1     0    0     0     0  475     1     0  653     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:      0    0     1     0    0     0     0  500     1     0  687     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:     0    0     1     0    0     0     0  500     1     0  687     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx   6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx   251  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx   755  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx   755  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  0.00  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx   0.0  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx   9.8 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     *    *     A     *    *     *     *    *     *     *    *     *
Movement:      LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:      *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:        9.8            xxxxxx           xxxxxx           xxxxxx
ApproachLOS:         A                *                *                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
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                   Artesia Boulevard Senior Housing
                        Year 2011 With Project
                          Evening Peak Hour
--------------------------------------------------------------------------------
                  Level Of Service Computation Report
        2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #1 Project Access (NS) at Artesia Boulevard (EW)
********************************************************************************
Average Delay (sec/veh):      0.0       Worst Case Level Of Service: B[ 13.2]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R    L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:        Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:        0  0  0  0  1    0  0  0  0  0    0  0  1  1  0    0  0  2  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:       0    0     0     0    0     0     0 1110     0     0  689     0
Growth Adj:  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02
Initial Bse:    0    0     0     0    0     0     0 1132     0     0  703     0
Added Vol:      0    0     1     0    0     0     0   25     2     0   28     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:    0    0     1     0    0     0     0 1157     2     0  731     0
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95  0.95 0.95  0.95
PHF Volume:     0    0     1     0    0     0     0 1218     2     0  769     0
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:    0    0     1     0    0     0     0 1218     2     0  769     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:xxxxx xxxx   6.9 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
FollowUpTim:xxxxx xxxx   3.3 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: xxxx xxxx   610  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Potent Cap.: xxxx xxxx   442  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Move Cap.:   xxxx xxxx   442  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Volume/Cap:  xxxx xxxx  0.00  xxxx xxxx  xxxx  xxxx xxxx  xxxx  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx   0.0  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:xxxxx xxxx  13.2 xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:    *    *     B     *    *     *     *    *     *     *    *     *
Movement:    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT    LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    *     *     *    *     *     *    *     *     *    *     *
ApproachDel:        13.2            xxxxxx           xxxxxx           xxxxxx
ApproachLOS:          B                *                *                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
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Artesia Boulevard Senior Housing
Year 2011 With Project
Morning Peak Hour

Level Of Service Computation Report
2000 HCM Unsignalized Method (Future Volume Alternative)

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********************************************************************************
Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)
********************************************************************************
Average Delay (sec/veh):      1.6       Worst Case Level Of Service: C[ 18.1]
********************************************************************************
Approach:      North Bound       South Bound       East Bound        West Bound
Movement:     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R     L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign         Stop Sign        Uncontrolled      Uncontrolled
Rights:          Include           Include           Include           Include
Lanes:        0  0  1! 0  0     0  0  1! 0  0     1  0  2  0  1     1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      17    1    27    14    1    18     7  430    18    28  598    17
Growth Adj:  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02
Initial Bse:   17    1    28    14    1    18     7  439    18    29  610    17
Added Vol:      0    0     0     0    0     0     0   12     0     1    7     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   17    1    28    14    1    18     7  451    18    30  617    17
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.73 0.73  0.73  0.75 0.75  0.75  0.90 0.90  0.90  0.97 0.97  0.97
PHF Volume:    24    1    38    19    1    24     8  499    20    30  633    18
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   24    1    38    19    1    24     8  499    20    30  633    18
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:  893 1227   250   960 1229   317   651 xxxx xxxxx   519 xxxx xxxxx
Potent Cap.:  239  180   757   214  179   685   945 xxxx xxxxx  1057 xxxx xxxxx
Move Cap.:    223  173   757   197  173   685   945 xxxx xxxxx  1057 xxxx xxxxx
Volume/Cap:  0.11 0.01  0.05  0.10 0.01  0.04  0.01 xxxx  xxxx  0.03 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.0 xxxx xxxxx   0.1 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   8.8 xxxx xxxxx   8.5 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     A    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx  382 xxxxx  xxxx  319 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  0.6 xxxxx xxxxx  0.5 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 16.2 xxxxx xxxxx 18.1 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    C     *     *    C     *     *    *     *     *    *     *
ApproachDel:      16.2              18.1            xxxxxx            xxxxxx
ApproachLOS:        C                 C                *                 *
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Note: Queue reported is the number of cars per lane.
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                     Artesia Boulevard Senior Housing
                         Year 2011 With Project
                           Evening Peak Hour
--------------------------------------------------------------------------------

                   Level Of Service Computation Report
         2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #2 Indiana Avenue (NS) at Artesia Boulevard (EW)
********************************************************************************
Average Delay (sec/veh):      3.5      Worst Case Level Of Service: F[ 55.0]
********************************************************************************
Approach:     North Bound      South Bound      East Bound       West Bound
Movement:    L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Stop Sign        Stop Sign       Uncontrolled     Uncontrolled
Rights:          Include          Include          Include          Include
Lanes:       0  0  1! 0  0   0  0  1! 0  0   1  0  2  0  1   1  0  2  0  1
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:      15    1    44     9    4    27    22 1063    25    49  647    19
Growth Adj:  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02
Initial Bse:   15    1    45     9    4    28    22 1084    26    50  660    19
Added Vol:      0    0     0     0    0     0     0   26     0     2   28     0
PasserByVol:    0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:   15    1    45     9    4    28    22 1110    26    52  688    19
User Adj:    1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:     0.67 0.67  0.67  0.91 0.91  0.91  0.99 0.99  0.99  0.97 0.97  0.97
PHF Volume:    23    2    67    10    4    30    23 1124    26    54  708    20
Reduct Vol:     0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:   23    2    67    10    4    30    23 1124    26    54  708    20
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:  7.5  6.5   6.9   7.5  6.5   6.9   4.1 xxxx xxxxx   4.1 xxxx xxxxx
FollowUpTim:  3.5  4.0   3.3   3.5  4.0   3.3   2.2 xxxx xxxxx   2.2 xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol: 1633 2005   562  1424 2011   354   728 xxxx xxxxx  1150 xxxx xxxxx
Potent Cap.:   68   60   475    98   60   648   884 xxxx xxxxx   615 xxxx xxxxx
Move Cap.:     56   54   475    75   53   648   884 xxxx xxxxx   615 xxxx xxxxx
Volume/Cap:  0.41 0.03  0.14  0.13 0.08  0.05  0.03 xxxx  xxxx  0.09 xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:   xxxx xxxx xxxxx  xxxx xxxx xxxxx   0.1 xxxx xxxxx   0.3 xxxx xxxxx
Control Del:xxxxx xxxx xxxxx xxxxx xxxx xxxxx   9.2 xxxx xxxxx  11.4 xxxx xxxxx
LOS by Move:    *    *     *     *    *     *     A    *     *     B    *     *
Movement:     LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx  158 xxxxx  xxxx  169 xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
SharedQueue:xxxxx  3.0 xxxxx xxxxx  1.0 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shrd ConDel:xxxxx 55.0 xxxxx xxxxx 33.8 xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
Shared LOS:     *    F     *     *    D     *     *    *     *     *    *     *
ApproachDel:      55.0             33.8            xxxxxx           xxxxxx
ApproachLOS:        F                D                *                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
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                     Artesia Boulevard Senior Housing
                          Year 2011 With Project
                            Morning Peak Hour
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                    Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)
********************************************************************************
Average Delay (sec/veh):       1.8       Worst Case Level Of Service: A[  8.8]
********************************************************************************
Approach:       North Bound      South Bound       East Bound       West Bound
Movement:      L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:       Uncontrolled     Uncontrolled       Stop Sign        Stop Sign
Rights:           Include          Include          Include          Include
Lanes:         0  1  0  0  0   0  0  0  1  0   0  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        9   36    0     0   16   11     3    0    4     0    0    0
Growth Adj:   1.02 1.02 1.02  1.02 1.02 1.02  1.02 1.02 1.02  1.02 1.02 1.02
Initial Bse:     9   37    0     0   16   11     3    0    4     0    0    0
Added Vol:       0    0    0     0    0    1     1    0    0     0    0    0
PasserByVol:     0    0    0     0    0    0     0    0    0     0    0    0
Initial Fut:     9   37    0     0   16   12     4    0    4     0    0    0
User Adj:     1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00  1.00 1.00 1.00
PHF Adj:      0.87 0.87 0.87  0.68 0.68 0.68  0.58 0.58 0.58  1.00 1.00 1.00
PHF Volume:     11   42    0     0   24   18     7    0    7     0    0    0
Reduct Vol:      0    0    0     0    0    0     0    0    0     0    0    0
FinalVolume:    11   42    0     0   24   18     7    0    7     0    0    0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:    42 xxxx xxxxx  xxxx xxxx xxxxx    97   97    33  xxxx xxxx xxxxx
Potent Cap.:  1580 xxxx xxxxx  xxxx xxxx xxxxx   907  797  1046  xxxx xxxx xxxxx
Move Cap.:    1580 xxxx xxxxx  xxxx xxxx xxxxx   903  792  1046  xxxx xxxx xxxxx
Volume/Cap:   0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.01 0.00  0.01  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:     0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:   7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     A    *     *     *    *     *     *    *     *     *    *     *
Movement:      LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  969 xxxxx  xxxx xxxx xxxxx
SharedQueue:   0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.0 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:   7.3 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  8.8 xxxxx xxxxx xxxx xxxxx
Shared LOS:      A    *     *     *    *     *     *    A     *     *    *     *
ApproachDel:       xxxxxx           xxxxxx             8.8            xxxxxx
ApproachLOS:          *                *                A                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
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                      Artesia Boulevard Senior Housing
                           Year 2011 With Project
                              Evening Peak Hour
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                     Level Of Service Computation Report
           2000 HCM Unsignalized Method (Future Volume Alternative)
********************************************************************************
Intersection #3 Indiana Avenue (NS) at Alley (Project Access) (EW)
********************************************************************************
Average Delay (sec/veh):      2.6      Worst Case Level Of Service: A[  9.2]
********************************************************************************
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R   L  -  T  -  R   L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Control:      Uncontrolled     Uncontrolled      Stop Sign        Stop Sign
Rights:          Include          Include          Include          Include
Lanes:        0  1  0  0  0   0  0  0  1  0   0  0  1! 0  0   0  0  0  0  0
------------|---------------||---------------||---------------||---------------|
Volume Module:
Base Vol:        5   24     0     0   38     3    14    0     5     0    0     0
Growth Adj:   1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02  1.02 1.02  1.02
Initial Bse:     5   24     0     0   39     3    14    0     5     0    0     0
Added Vol:       0    0     0     0    0     2     1    0     0     0    0     0
PasserByVol:     0    0     0     0    0     0     0    0     0     0    0     0
Initial Fut:     5   24     0     0   39     5    15    0     5     0    0     0
User Adj:     1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00  1.00 1.00  1.00
PHF Adj:      0.66 0.66  0.66  0.57 0.57  0.57  0.53 0.53  0.53  1.00 1.00  1.00
PHF Volume:      8   37     0     0   68     9    29    0    10     0    0     0
Reduct Vol:      0    0     0     0    0     0     0    0     0     0    0     0
FinalVolume:     8   37     0     0   68     9    29    0    10     0    0     0
------------|---------------||---------------||---------------||---------------|
Critical Gap Module:
Critical Gp:   4.1 xxxx xxxxx xxxxx xxxx xxxxx   6.4  6.5   6.2 xxxxx xxxx xxxxx
FollowUpTim:   2.2 xxxx xxxxx xxxxx xxxx xxxxx   3.5  4.0   3.3 xxxxx xxxx xxxxx
------------|---------------||---------------||---------------||---------------|
Capacity Module:
Cnflict Vol:    77 xxxx xxxxx  xxxx xxxx xxxxx   125  125    73  xxxx xxxx xxxxx
Potent Cap.: 1535 xxxx xxxxx  xxxx xxxx xxxxx   874  769   995  xxxx xxxx xxxxx
Move Cap.:   1535 xxxx xxxxx  xxxx xxxx xxxxx   871  765   995  xxxx xxxx xxxxx
Volume/Cap:  0.01 xxxx  xxxx  xxxx xxxx  xxxx  0.03 0.00  0.01  xxxx xxxx  xxxx
------------|---------------||---------------||---------------||---------------|
Level Of Service Module:
2Way95thQ:     0.0 xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx xxxx xxxxx
Control Del:   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx xxxxx xxxx xxxxx
LOS by Move:     A    *     *     *    *     *     *    *     *     *    *     *
Movement:      LT - LTR - RT   LT - LTR - RT   LT - LTR - RT   LT - LTR - RT
Shared Cap.: xxxx xxxx xxxxx  xxxx xxxx xxxxx  xxxx  899 xxxxx  xxxx xxxx xxxxx
SharedQueue:   0.0 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  0.1 xxxxx xxxxx xxxx xxxxx
Shrd ConDel:   7.4 xxxx xxxxx xxxxx xxxx xxxxx xxxxx  9.2 xxxxx xxxxx xxxx xxxxx
Shared LOS:      A    *     *     *    *     *     *    A     *     *    *     *
ApproachDel:      xxxxxx           xxxxxx              9.2            xxxxxx
ApproachLOS:         *                *                 A                *
********************************************************************************
Note: Queue reported is the number of cars per lane.
********************************************************************************
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