Traffic Impact Analysis

Smith's Fuel Center - Candelaria Road and Palo Verde Drive

Albuquerque, New Mexico

January 2012
Updated January 31, 2012

Falcon Traffic Engineering
9221 South Falcon Way
Sandy, Utah 84093
Telephone (801) 395-4054
Fax (801) 942-7552

FALCON TRAFFIC

TRAFFIC STUDY

Gasoline/Service Station
(944)

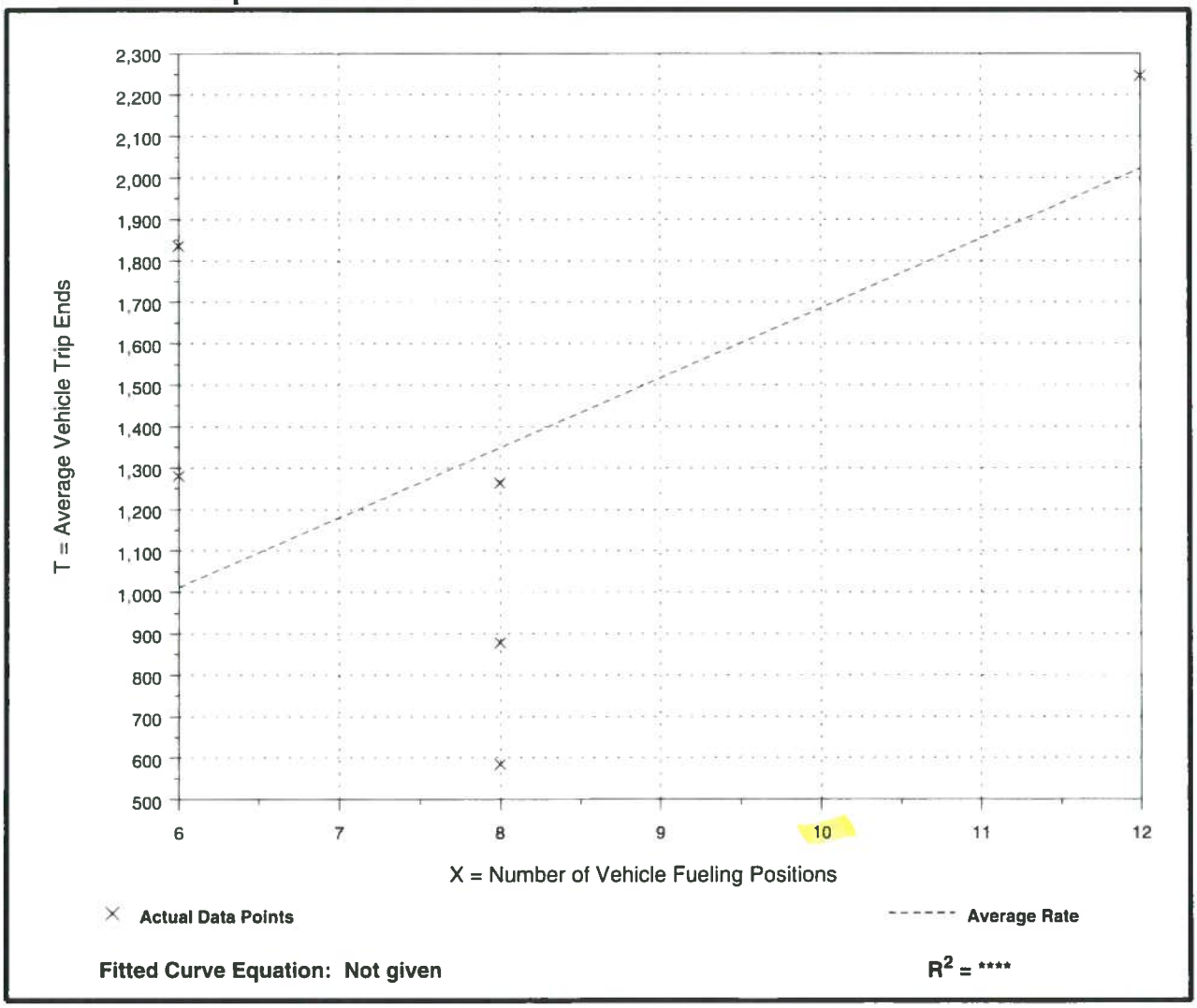
Average Vehicle Trip Ends vs: Vehicle Fueling Positions
On a: Weekday

Number of Studies: 6
Average Vehicle Fueling Positions: 8
Directional Distribution: 50% entering, 50% exiting

Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
168.56	73.00 - 306.00	71.19

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****

Gasoline/Service Station
(944)

Average Vehicle Trip Ends vs: **Vehicle Fueling Positions**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

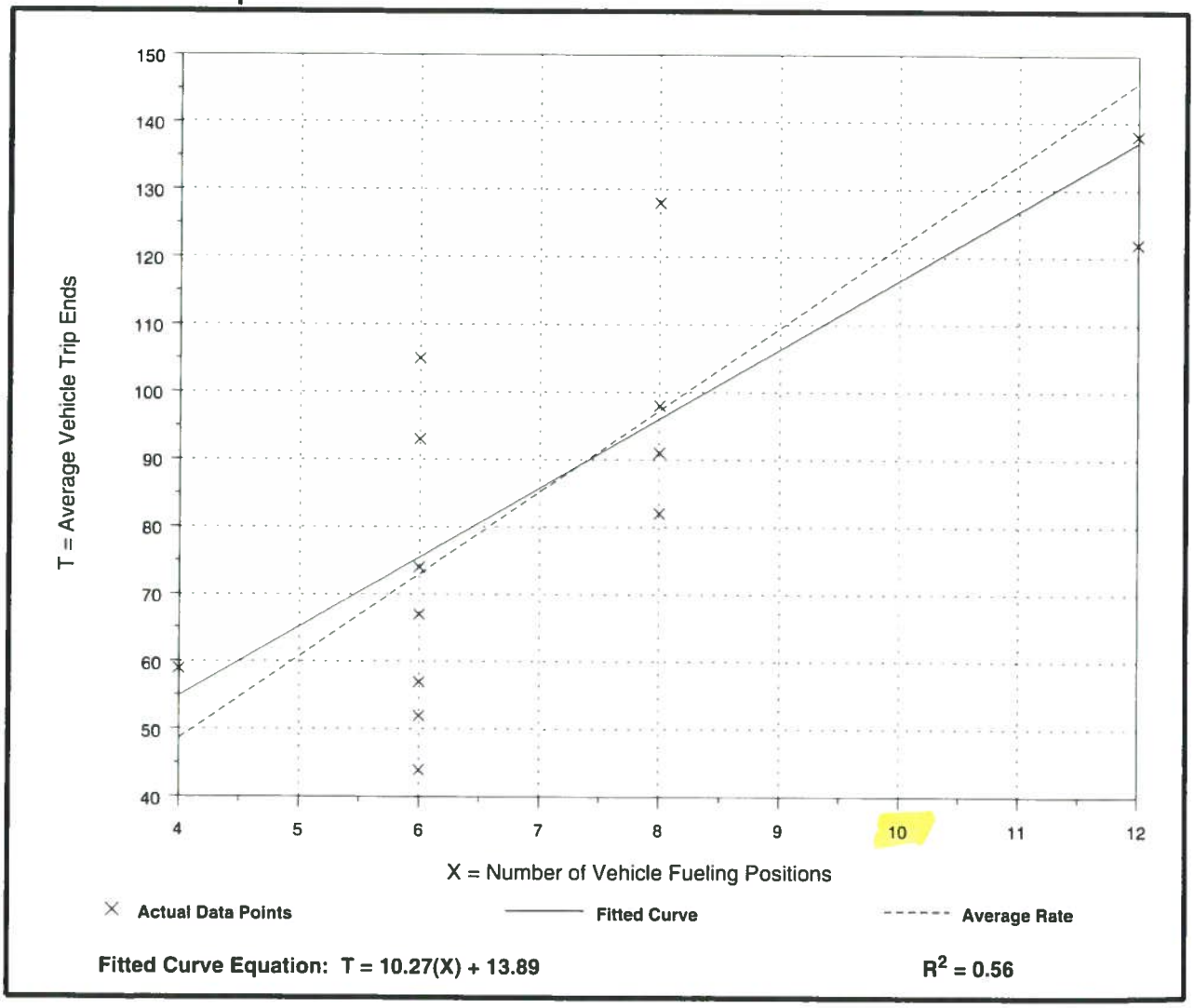
Number of Studies: 15
Average Vehicle Fueling Positions: 7
Directional Distribution: 51% entering, 49% exiting

62 60

Trip Generation per Vehicle Fueling Position

Average Rate	Range of Rates	Standard Deviation
12.16	7.33 - 17.50	4.29

Data Plot and Equation



Fitted Curve Equation: T = 10.27(X) + 13.89

R^2 = 0.56

Gasoline/Service Station
(944)

Average Vehicle Trip Ends vs: **Vehicle Fueling Positions**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

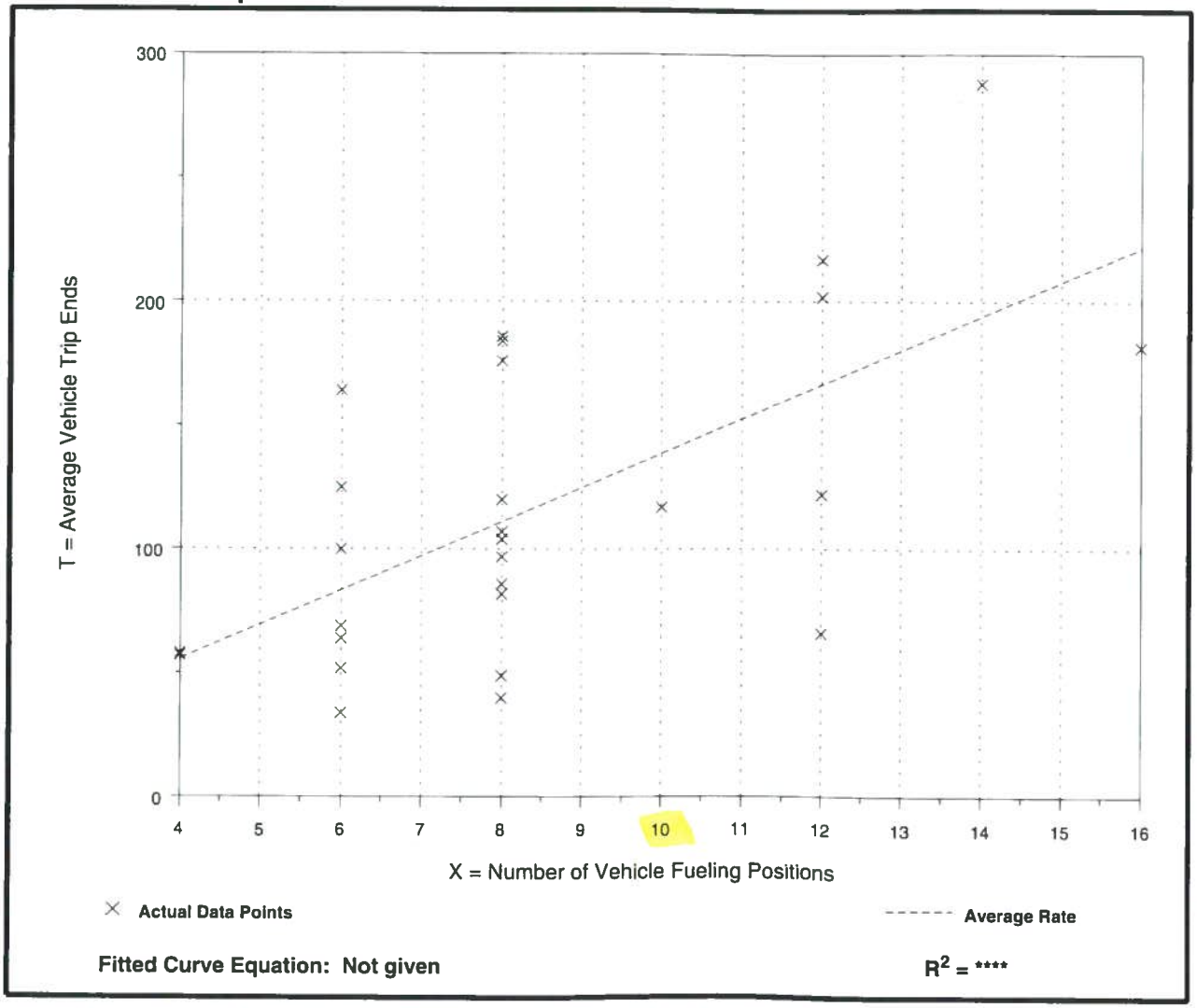
Number of Studies: 28
Average Vehicle Fueling Positions: 8
Directional Distribution: 50% entering, 50% exiting

69 69

Trip Generation per Vehicle Fueling Position

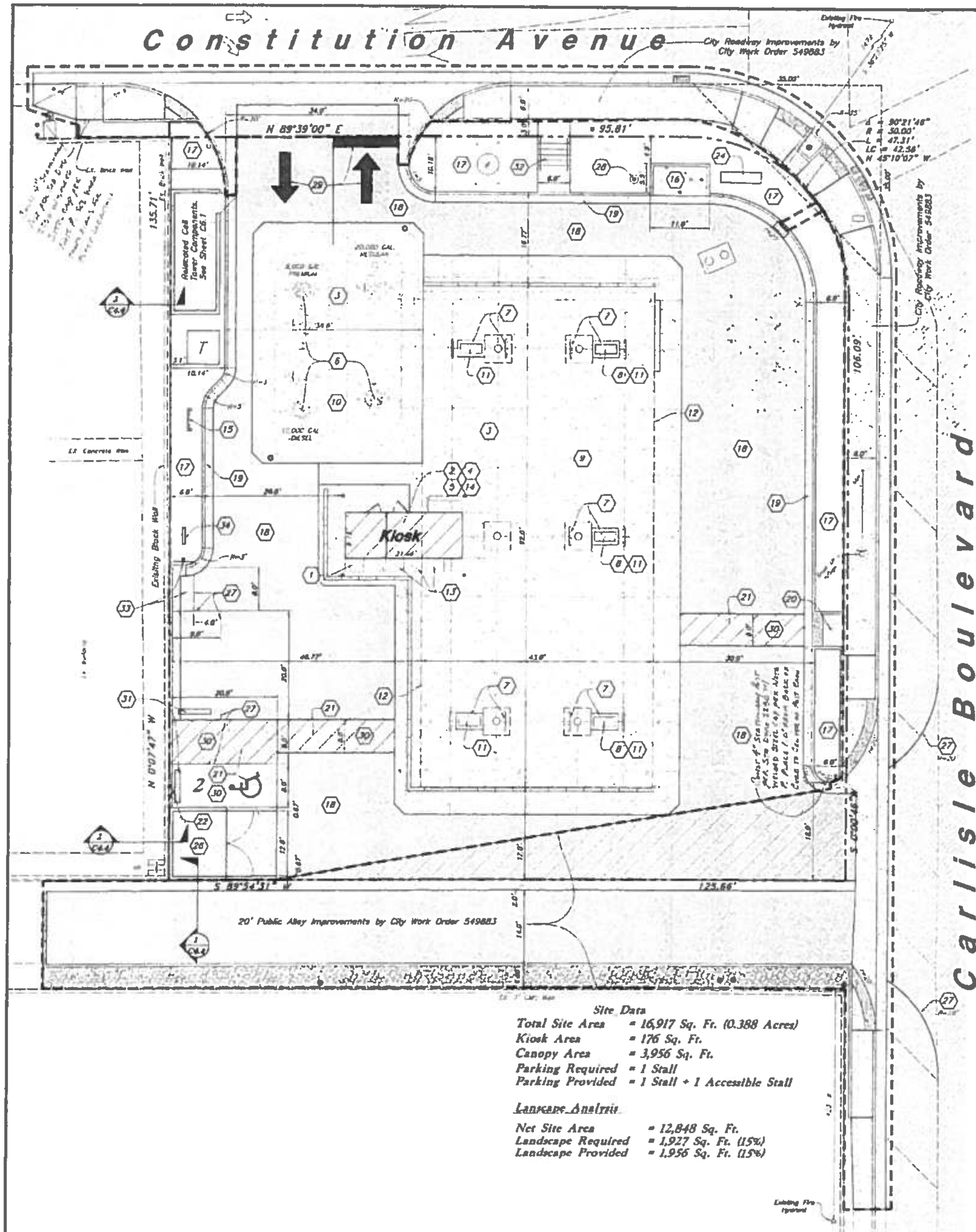
Average Rate	Range of Rates	Standard Deviation
13.87	5.00 - 27.33	6.65

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****



Site Data

Total Site Area	= 16,917 Sq. Ft. (0.388 Acres)
Kiosk Area	= 176 Sq. Ft.
Canopy Area	= 3,956 Sq. Ft.
Parking Required	= 1 Stall
Parking Provided	= 1 Stall + 1 Accessible Stall

Lanscape Analysis

Net Site Area	= 12,848 Sq. Ft.
Landscape Required	= 1,927 Sq. Ft. (15%)
Landscape Provided	= 1,956 Sq. Ft. (15%)

General Site Notes:

1. All dimensions are to back of curb unless otherwise noted.
2. Should discrepancies be found between the civil and architectural drawings, the civil plans shall govern.
3. Contractor shall paint the canopy collection boxes white to match the decking color.
4. Install a 2"x4" by 2'-3' long knockout in the top of the footings for the conduit. Typical for all columns with conduit. (See Utility Plan)

Scale : 1" = 10'

Site Construction Notes

1. Construct level concrete pad for outside storage unit. Supply, assemble and install outside storage unit. Unit shall be stiffened and anchored. (Rubbermaid #3748 52 cubic vertical storage unit)
2. Install roof penetration in kiosk and weather proof for speaker/camera wire installation.
3. Contractor shall have all concrete slabs cleaned and sealed. Coordinate with Owner's Sub-Consultant (White Mountain, Mike Letts 801-547-9278).
4. Caulk and Paint as Necessary to Touch up Exterior Panels of Kiosk
5. Provide a water tight seal between the kiosk foundation and canopy slab.
6. Clean and paint the tank manhole covers. Paint fuel designations at the drop tubes with the correct color and name.

   All paints specified are Sherwin Williams Industrial Enamel B54Z Series. When painting manholes, the rim of the manhole that is embedded in the concrete should be painted along with the manhole lid.

   Regular Unleaded SW4089, Pure White with a Black cross.
   Premium Unleaded SW4081, Safety Red with a White cross.
   Diesel SW4084, Safety Yellow
7. Paint all bollards and island forms with Contractor supplied Imron Paint.
8. Install a diesel tee, plug, and fittings in the MPD sumps in those islands containing diesel.
9. Construct 6" Thick Concrete Canopy Drive Slab w/ Fiber Mesh (See Architectural Plans for Section)
10. Construct 8" Thick Concrete Tank Pad w/ Fiber Mesh & Rebar Reinforcing. (See Architectural Plans for Section)
11. Construct Dispenser Islands w/ Bollard Protection and Install Fuel Dispenser (See Arch Plans)
12. Overhead Canopy System Supplied and Installed by others. General Contractor to Install Footings, per Ventaire Drawings, Conduits, & Conductors. (See Arch. Plans)
13. Vending Machines (typ)
14. General Contractor to Const. Floor and Foundation then Place Prefabricated Kiosk (11/C4.2) (12/C4.2)
15. Const. Remote Tank Vent Riser (See Architectural Plans).
16. Const. Air / Water / Phone Pad. 5'x10'x6" (12/C4.2) (10/C4.2)
17. Landscaping
18. Const. 4" Asphalt Paving over 8" Aggregate Base Course (2/C4.1)
19. Const. 24" Concrete Curb and Gutter (1/C4.1)
20. Const. ADA Accessible Curb Ramp (4/C4.1)
21. Const. ADA Accessible Striping
22. Const. ADA Accessible Sign (7/C4.1)
23. Not Used
24. Proposed Pylon Sign Location (By Separate Permit)
25. Not Used
26. Const. Dumpster Enclosure (19/C4.2)
27. Const. 4" Paint Stripes (Color: White)
28. Const. Light Pole (See Site Electrical Plans)
29. Const. Asphalt Markings per MUTCD
30. Const. 6" Concrete Paving (1/C4.1)
31. Const. Concrete Wheel Stop
32. Const. 6" Conc. Sidewalk, Stairs & Railings (31/C4.4)
33. Const. Motorcycle Parking Space & Sign (3C/C4.4)
34. Const. Bicycle Rack (31/C4.4)

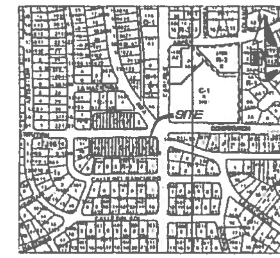
Contractor NOTES:

1. New Communication Equipment to be Installed Prior to Shut Down of Existing Communication Equipment and Construction of the Fuel Center. Coordinate with Tmobile.

Public infrastructure shown on these plans for information only and not part of approval. Separate DRC/Permit approval and Work Order required

TRAFFIC CIRCULATION LAYOUT APPROVED

ALL WHEELCHAIR RAMPS LOCATED WITHIN THE PUBLIC RIGHT OF WAY MUST HAVE TRUNCATED DOMES


Zone Atlas Page: J-16-Z

Legend

- Proposed Asphalt
- Existing Asphalt
- Proposed Concrete
- Existing Improvements
- Proposed Improvements
- Existing Inlet Box
- Proposed Inlet Box
- Exist. Catch Basin
- Catch Basin
- Proposed Manhole
- Existing Manhole
- Fire Hydrant
- Existing Fire Hydrant
- Existing Light Pole
- Proposed Light Pole
- Property Line
- Detail Number
- Sheet Number

Legal Description

Lots 1-5 and the Easterly 1 foot of Lot 6 of Unit no. 3, Block 12-Business Section of the McDuffie Place Subdivision

ADA Note:

Contractor must maintain a running slope on Accessible routes no steeper than 5.0% (1:20). The cross slope for Accessible routes must be no steeper than 2.0% (1:50). All Accessible routes must have a minimum clear width of 36" If Grades on plans do not meet this requirement notify Consultant immediately.

The Client, Contractor and Subcontractor should immediately notify the Consultant of any conditions of the project that they believe do not comply with the current state of the ADA and/or FHAA.

Private Engineer's Notice to Contractors

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property: that this requirement shall apply continuously and not be limited to normal working hours; and that the contractor shall defend, indemnify, and hold the owner and the engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting for liability arising from the sole negligence of the owner or the engineer.

Survey Control Note:

The contractor or surveyor shall be responsible for following the National Society of Professional Surveyors (NSPS) model standards for any surveying or construction layout to be completed using Great Basin Engineering's ALTA Surveying or Great Basin Engineering's construction improvement plans. Prior to proceeding with construction staking, the surveyor shall be responsible for verifying horizontal control from the survey monuments and for verifying any additional control points shown on an ALTA survey or improvement plan or on electronic data provided by Great Basin Engineering. The surveyor shall also use the benchmarks as shown on the plan, and verify them against no less than three existing hard improvement elevations included on these plans or on electronic data provided by Great Basin Engineering. If any discrepancies are encountered, the surveyor shall immediately notify the engineer and resolve the discrepancies before proceeding with any construction staking.

Smith's
FOOD & DRUG STORES
1550 South Redwood Road
Salt Lake City, Utah 84104
Telephone (801) 974-1400

#496

Bernalillo County, New Mexico

Designed by: AAA
Drafted by: AAA
Client Name: Smith's
SM7496_FC

GREAT BASIN ENGINEERING - SOUTH
CONSULTING ENGINEERS and LAND SURVEYORS
2010 North Redwood Road, P.O. Box 16747
Salt Lake City, Utah 84116

Site Plan

Smith's Fuel Center #496
1313 Carlisle Boulevard NE
City of Albuquerque, Bernalillo County, New Mexico

18 Sep, 2009

SHEET NO.
C1.1

FAX TRANSMISSION

Great Basin Engineering – South
2010 North Redwood Road P.O. Box 16747 Salt Lake City, Utah 84116
(801) 521-8529 (801) 394-7288 Fax (801) 521-9551

TO: Tony Loyd

DATE: November 4, 2002

FAX #: (505) 924-3864

PAGES: 7
(Including Cover)

FROM: Robert Schmidt

SUBJECT: Smith's Fuel Center Trmwy

COMMENTS:

November 4, 2002

Mr. Tony Loyd
Associate Engineer
City of Albuquerque
600 2nd Street NW
Albuquerque, NM 87102

RE: Smith's Gas Station at Tramway and Central

Dear Mr. Loyd,

On September 5th, 2001, A-Trans Engineering provided an analysis of Smith's gas stations indicating the trip generation of four Smith's gas stations in Utah and providing information on the directional split and amount of internal shared trips. This letter now applies that information to a specific store in the Albuquerque area located on Tramway and Central. The following addresses the operations of Smith's primary driveway on Tramway, located south of Central in Albuquerque, NM.

The most critical question for the addition of the gas station is will the existing left turn ingress lane be adequate or is there a concern that the additional traffic will cause spillage into the through lane. The existing inbound left turns were counted from 3:00 to 6:00 PM on Wednesday, October 30, 2002. It was again counted on Friday, November 1, 2002 as it was felt a Friday, the first of the month is often a higher than a normal time. The PM peak is the critical time for the store and the queue issue and therefore is the period being analyzed. The peak hour is identified as 5 to 6 PM. Please note that no counts were available from the egress traffic on the Westside of Tramway, a Raley's shopping center. The lack of this data does not impact the assessment of the inbound left turn queue. Using the Highway Capacity Manual, the assessment of the existing access operations is considered.

As per the September 5, 2001 analysis, the PM peak trip rate for a Smith's gas station is 80.75 trips for a 5-pump, 10-station location. Of the traffic in the PM peak, 21% of the gas station traffic is site related meaning they shopped and then used the gas station and therefore are not new traffic to the site. The remaining 79% does not utilize the store when getting gas and constitute new traffic in the area. One other factor observed was the directional split which indicated 52% Inbound trips and 48% Outbound. By applying the 79% to the 80.75 trips produces an estimated 64 new trips in the PM peak that will be generated by a new gas station. By applying the 52% in and 48% out directional split, it is estimated that 33 new inbound trips and 31 new outbound trips will be created by the gas station.

The proposed gas station at Tramway is only 4 pumps, eight-stations and therefore, an 80% factor could be applied to the projected gas station trips. However, since we only have specific data for the 5-pump station, we will apply this rate even though it is likely higher than what will occur.

It is assumed that all gas station trips will enter and exit at this single site access. Additionally, they are assumed to come from the north which implies the worst-case situation from a queuing aspect. Table One shows the projected gas traffic and resulting total new traffic when combined with the existing traffic.

P.O. Box 521651 Salt Lake City, UT. 84152
(801) 949-0348 • Fax: (801) 582-6252 • atrans@networld.com

Table One: PM Peak Turning Movement Traffic

	Existing	New Gas	Total
NBL	27		27
NBT	209		209
NBR	25		25
SBL	329	33	362
SBT	406		406
SBR	66		66
WBR	155	31	186

There will be an estimated 10% increase in southbound left turns at the access as a result of the gas station. Using the 2000 Highway Capacity Manual Software (HCS 2000) we analyzed the intersections as existing and with the gas station traffic to determine the change in Levels of Service and 95% queue rate in vehicles. Table Two provides the delay in seconds per vehicle and the corresponding LOS, the v/c ratio as a function of percent of capacity and the 95% queue and a function of vehicles.

Table Two: Access PM Peak Turning Movement Analysis

	Existing			With Gas		
	Delay / LOS	V/C Ratio	95% Queue (vehicles)	Delay / LOS	V/C Ratio	95% Queue (vehicles)
NBL	8.5 / A	0.03	0.09	8.5 / A	0.03	0.09
SBL	8.8 / A	0.28	1.14	8.9 / A	0.31	1.30
WBR	9.8 / A	0.19	0.68	10.0 / B	0.22	0.86

Based on the geometry provided, (2 lanes in each direction on Tramway, a left and right turn lane into and out of the access), the HCM analysis does not indicate a queue concern nor a congestion problem. The current 140 feet of storage should provide adequate storage for the projected queue.

There is an additional 33 southbound left turns projected entering the site as a result of the additional gas station. This will be an estimated 1 vehicles every 2 minutes. The addition of one vehicle each 2 minutes is not anticipated to create an additional queue problem for the southbound left turns. For this reason, we do not expect queue problems to increase and the access should continue to operate in a similar manner.

Should you have any questions, please contact me at your earliest convenience to discuss the issues.

Sincerely,
A-Trans Engineering

Joseph Perrin, PhD, PE, PTOE
Principal

HCS2000: Unsignalized Intersections Release 4.1

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: A-Trans Engineering
Date Performed: 11/1/2002
Analysis Time Period: PM Peak
Intersection: Smith's Access
Jurisdiction: Alb. NM
Analysis Year: 2002 - PM
Project ID: Gas Station assessment
East/West Street: Access
North/South Street: Tramway

Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	27	209	25	329	406	66
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	30	232	27	365	451	73
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			No			No
Lanes	1	2	1	1	1	1
Configuration		L	T R		L	T R
Upstream Signal?			No			No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0		155	0		0
Peak Hour Factor, PHF	0.90		0.90	0.90		0.90
Hourly Flow Rate, HFR	0		172	0		0
Percent Heavy Vehicles	0		0	0		0
Percent Grade (%)		0			0	
Median Storage 5						
Flared Approach: Exists?						
Storage						
RT Channelized?			No			No
Lanes	1		1	1		
Configuration		L	R		L	R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound	Eastbound

Movement	1	4	7	8	9	10	11	12
Lane Config	L	L	L		R	L		R
v (vph)	30	365	0		172	0		0
C(m) (vph)	1053	1317	109		921	145		561
v/c	0.03	0.28	0.00		0.19	0.00		0.00
95% queue length	0.09	1.14	0.00		0.68	0.00		0.00
Control Delay	8.5	8.8	38.0		9.8	29.8		11.4
LOS	A	A	E		A	D		B
Approach Delay			9.8					
Approach LOS			A					

HCS2000: Unsignalized Intersections Release 4.1

Phone: Fax:
E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst:
Agency/Co.: A-Trans Engineering
Date Performed: 11/1/2002
Analysis Time Period: PM Peak
Intersection: Smith's Access
Jurisdiction: Alb. NM
Analysis Year: 2002 - PM
Project ID: Gas Station assessment
East/West Street: Access
North/South Street: Tramway

Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	27	209	25	329	406	66
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Peak-15 Minute Volume	8	58	7	91	113	18
Hourly Flow Rate, HFR	30	232	27	365	451	73
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			No			No
Lanes	1	2	1		1	1	1

HCS2000: Unsignalized Intersections Release 4.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: Joe
Agency/Co.: A-Trans Engineering
Date Performed: 11/1/2002
Analysis Time Period: PM Peak
Intersection: Smith's Access
Jurisdiction: Alb. NM
Analysis Year: 2002 - PM w/gas
Project ID: Gas Station assessment with Gas Station
East/West Street: Access
North/South Street: Tramway

Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	27	209	25	362	406	66
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	30	232	27	402	451	73
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			No			No
Lanes	1	2	1	1	1	1
Configuration		L	T R		L	T R
Upstream Signal?			No			No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	186	0	0		
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	0	206	0	0		
Percent Heavy Vehicles	0	0	0	0		
Percent Grade (%)		0		0		
Median Storage	5					
Flared Approach: Exists?						
Storage						
RT Channelized?			No			No
Lanes	1	1	1	1		
Configuration		L	R	L	R	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound	Eastbound

Movement	1	4	7	8	9	10	11	12
Lane Config	L	L	L		R	L		R
v (vph)	30	402	0		206	0		0
C(m) (vph)	1053	1317	90		921	126		561
v/c	0.03	0.31	0.00		0.22	0.00		0.00
95% queue length	0.09	1.30	0.00		0.86	0.00		0.00
Control Delay	8.5	8.9	45.0		10.0+	33.6		11.4
LOS	A	A	E		B	D		B
Approach Delay			10.0+					
Approach LOS			B					

HCS2000: Unsignalized Intersections Release 4.1

Phone: Fax:
E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Joe
Agency/Co.: A-Trans Engineering
Date Performed: 11/1/2002
Analysis Time Period: PM Peak
Intersection: Smith's Access
Jurisdiction: Alb. NM
Analysis Year: 2002 - PM w/gas
Project ID: Gas Station assessment with Gas Station
East/West Street: Access
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Vehicle Volumes and Adjustments

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	L	T	R	L	T	R
Volume	27	209	25	362	406	66
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Peak-15 Minute Volume	8	58	7	101	113	18
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Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			No			No
Lanes	1	2	1		1	1	1

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Salt Lake City, UT 84152

(801) 949-0348
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A-Trans Engineering

Fax

To:	Mr. Tony Loyd	**From:**	Joe Perrin, PhD, PE
Fax:	(505) 924-3864	**Pages:**	3
Phone:	(505) 924-3994	**Date:**	11/4/2002
Re:	Smith's Gas Station Tramway and Central	**CC:**	Mr. Robert Schmidt

☐ **Urgent** X **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

• **Comments:**

Tony,

Robert at Great Basin asked that I review the existing Smith's access on Tramway for impacts by the addition of a new Smith's gas station. I examined the access as it currently operates and with the new Gas Station traffic in HCS. The attached describes the results.

Please call me if you have any questions.

Thanks,

Joe

November 4, 2002

Mr. Tony Loyd
Associate Engineer
City of Albuquerque
600 2nd Street NW
Albuquerque, NM 87102

A-TRANS
TRANSPORTATION ENGINEERING

RE: Smith's Gas Station at Tramway and Central

Dear Mr. Loyd,

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SBL	8.8 / A	0.28	1.14	8.9 / A	0.31	1.30
WBR	9.8 / A	0.19	0.68	10.0 / B	0.22	0.86

Based on the geometry provided, (2 lanes in each direction on Tramway, a left and right turn lane into and out of the access), the HCM analysis does not indicate a queue concern nor a congestion problem. The current 140 feet of storage should provide adequate storage for the projected queue.

There is an additional 33 southbound left turns projected entering the site as a result of the additional gas station. This will be an estimated 1 vehicles every 2 minutes. The addition of one vehicle each 2 minutes is not anticipated to create an additional queue problem for the southbound left turns. For this reason, we do not expect queue problems to increase and the access should continue to operate in a similar manner.

Should you have any questions, please contact me at your earliest convenience to discuss the issues.

Sincerely,
A-Trans Engineering

Joseph Perrin, PhD, PE, PTOE
Principal

HCS2000: Unsignalized Intersections Release 4.1

TWO-WAY STOP CONTROL SUMMARY

Analyst:
Agency/Co.: A-Trans Engineering
Date Performed: 11/1/2002
Analysis Time Period: PM Peak
Intersection: Smith's Access
Jurisdiction: Alb. NM
Analysis Year: 2002 - PM
Project ID: Gas Station assessment
East/West Street: Access
North/South Street: Tramway

Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	27	209	25	329	406	66
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	30	232	27	365	451	73
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			No			No
Lanes	1	2	1	1	1	1
Configuration		L	T R		L	T R
Upstream Signal?			No			No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0		155	0		0
Peak Hour Factor, PHF	0.90		0.90	0.90		0.90
Hourly Flow Rate, HFR	0		172	0		0
Percent Heavy Vehicles	0		0	0		0
Percent Grade (%)		0			0	
Median Storage 5						
Flared Approach: Exists?						
Storage						
RT Channelized?			No			No
Lanes	1		1	1		1
Configuration		L	R		L	R

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound	Eastbound

Movement	1	4	7	8	9	10	11	12
Lane Config	L	L	L		R	L		R
v (vph)	30	365	0		172	0		0
C(m) (vph)	1053	1317	109		921	145		561
v/c	0.03	0.28	0.00		0.19	0.00		0.00
95% queue length	0.09	1.14	0.00		0.68	0.00		0.00
Control Delay	8.5	8.8	38.0		9.8	29.8		11.4
LOS	A	A	E		A	D		B
Approach Delay			9.8					
Approach LOS			A					

HCS2000: Unsignalized Intersections Release 4.1

Phone: Fax:
E-Mail:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst:
Agency/Co.: A-Trans Engineering
Date Performed: 11/1/2002
Analysis Time Period: PM Peak
Intersection: Smith's Access
Jurisdiction: Alb. NM
Analysis Year: 2002 - PM
Project ID: Gas Station assessment
East/West Street: Access
North/South Street: Tramway

Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	27	209	25	329	406	66
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Peak-15 Minute Volume	8	58	7	91	113	18
Hourly Flow Rate, HFR	30	232	27	365	451	73
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			No			No
Lanes	1	2	1	1	1	1

HCS2000: Unsignalized Intersections Release 4.1

TWO-WAY STOP CONTROL SUMMARY

Analyst: Joe
Agency/Co.: A-Trans Engineering
Date Performed: 11/1/2002
Analysis Time Period: PM Peak
Intersection: Smith's Access
Jurisdiction: Alb. NM
Analysis Year: 2002 - PM w/gas
Project ID: Gas Station assessment with Gas Station
East/West Street: Access
North/South Street: Tramway

Intersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street: Approach	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	27	209	25	362	406	66
Peak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
Hourly Flow Rate, HFR	30	232	27	402	451	73
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Raised curb					
RT Channelized?			No			No
Lanes	1	2	1	1	1	1
Configuration		L	T R		L	T R
Upstream Signal?			No			No

Minor Street: Approach	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	0	186	0	0		
Peak Hour Factor, PHF	0.90	0.90	0.90	0.90		
Hourly Flow Rate, HFR	0	206	0	0		
Percent Heavy Vehicles	0	0	0	0		
Percent Grade (%)		0		0		
Median Storage 5						
Flared Approach: Exists?						
Storage						
RT Channelized?			No			No
Lanes	1	1		1	1	
Configuration	L	R		L	R	

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound	Eastbound

11/03/2002 04:53	1	4	7	8	9	10	11	12
Lane Config	L	L	L	R	L	R		
v (vph)	30	402	0	206	0	0		
C(m) (vph)	1053	1317	90	921	126	561		
v/c	0.03	0.31	0.00	0.22	0.00	0.00		
95% queue length	0.09	1.30	0.00	0.86	0.00	0.00		
Control Delay	8.5	8.9	45.0	10.0+	33.6	11.4		
LOS	A	A	E	B	D	B		
Approach Delay			10.0+					
Approach LOS			B					

HCS2000: Unsignalized Intersections Release 4.1

Phone:
E-Mail:

Fax:

TWO-WAY STOP CONTROL(TWSC) ANALYSIS

Analyst: Joe
Agency/Co.: A-Trans Engineering
Date Performed: 11/1/2002
Analysis Time Period: PM Peak
ntersection: Smith's Access
Jurisdiction: Alb. NM
Analysis Year: 2002 - PM w/gas
Project ID: Gas Station assessment with Gas Station
East/West Street: Access
North/South Street: Tramway

ntersection Orientation: NS Study period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street Movements	1	2	3	4	5	6
	L	T	R	L	T	R
olume	27	209	25	362	406	66
eak-Hour Factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90
eak-15 Minute Volume	8	58	7	101	113	18
ourly Flow Rate, HFR	30	232	27	402	451	73
ercent Heavy Vehicles	0	--	--	0	--	--
edian Type	Raised curb					
T Channelized?			No			No
anes	1	2	1	1	1	1

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LETTER OF TRANSMITTAL

Date: 2/23/12	Job No.:
Attention: Kristal Metro	
Re: Smith's Candelaria & Palo Verde	

To: City of Albuquerque
600 2nd St. NW
Room 201
Albuquerque, NM 87102

WE ARE SENDING YOU:

COPIES	DATE	DESCRIPTION
2		Traffic Study
1		Traffic Simulation CD

THESE ARE TRANSMITTED as checked below:

- ☐ For approval
- ☐ For your use
- ☐ As requested
- ☐ For review and comment
- ☐ Approved as submitted
- ☐ Approved as noted
- ☐ Returned for corrections
- ☐ Other ____
- ☐ Please sign and return

RECEIVED
FEB 24 2012
HYDROLOGY SECTION

REMARKS

Shipping Instructions:

☒ Fed Ex ☐ (Standard) ☒ (Priority overnight)
Phone #:505-924-3997
☐ Priority Mail
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☐ Other ____

Copy to: _____

Received By:_____ From: Jeff Randall

Date: _____

Traffic Impact Analysis
for
Smith's Fuel Center -
Candelaria Road and Palo Verde Drive

Albuquerque, New Mexico

January 15, 2012
Updated January 31, 2012

Prepared by:

Falcon Traffic Engineering
9221 South Falcon Way
Sandy, Utah 84093
801-395-4054

Smith's Fuel Center –
Candelaria Road and Palo Verde Drive Traffic

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Candelaria Road and Palo Verde Drive Traffic

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I. Introduction

The following traffic study was completed at the request of the City of Albuquerque and the New Mexico Department of Transportation. The planned development is to be located at the existing location of a lube service center, on the north side of Candelaria Road, with the access opposing Palo Verde Drive to the south. The existing site also includes a car wash which is planned to remain. The fuel center will have 10 fuel positions. This study will look at the operation of the Candelaria Road and Tramway Boulevard, as well as Candelaria Road and Palo Verde Drive, with the addition of the Smith's fuel center. Candelaria Road is a four lane facility (two lanes in each direction without a center left turn lane at the location of the site access). There is a 30 mph speed limit on Calendaria Road at the site.

Figure One shows the vicinity map for the site. Figure Two shows the proposed site plan, including the proposed Smith's Fuel Center.

Trip projection and traffic analysis in this report will be performed for the AM and PM peak hours.

II. Existing Traffic Data

Intersection traffic counts in the area were reviewed for the purposes of this study.

A. Intersection Counts

Intersection counts for Tramway Boulevard and Candelaria Road were counted on Thursday, January 26, 2011. Traffic was recounted on the same day and time at the site access (Candelaria Road and Palo Verde Drive). Counts were made in 15 minute intervals. The AM Peak Hour was from 7:00 AM to 8:00 AM. The PM Peak Hour was from 4:45 PM to 5:45 PM. The peak hours were determined based on the total volumes of both intersections.

The updated site access counts were consistent with the previous counts.

Growth of background traffic in this was not considered as residential area east of Tramway Boulevard that would utilize Candelaria Road is built-out. The area east of Camino De Le Sierra is currently designated as open space as part of the Sandia Foothills Area Plan.

The traffic counts can be seen in Appendix A. Existing traffic counts can be seen in Figure Three.

Smith's Fuel Center Candelaria and Palo Verde
Vicinity Map

Figure One

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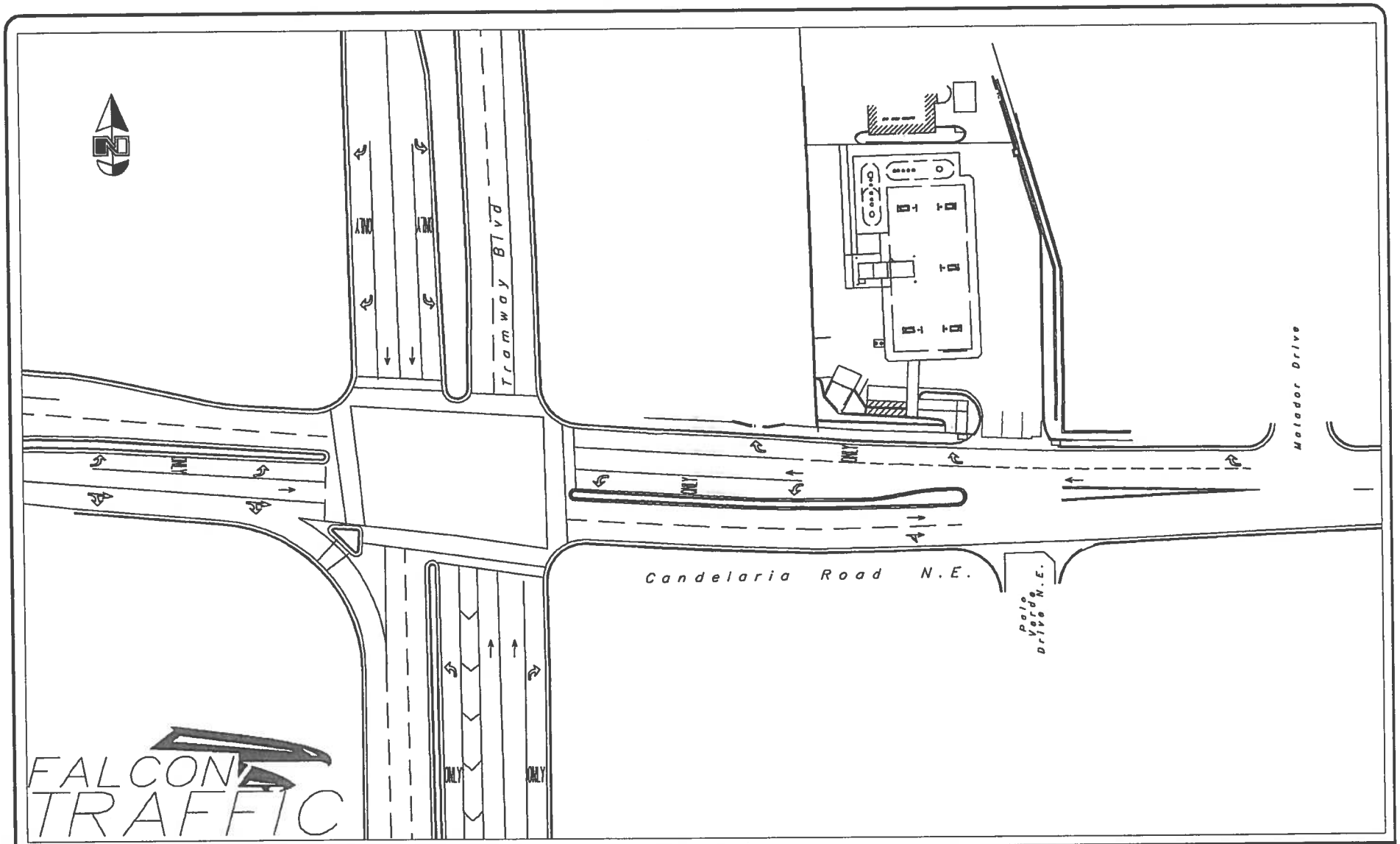

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Phone: 801-395-4054 Fax: 801-942-7552

Figure Two

Smith's Fuel Center Candelaria and Palo Verde
Conceptual Site Plan

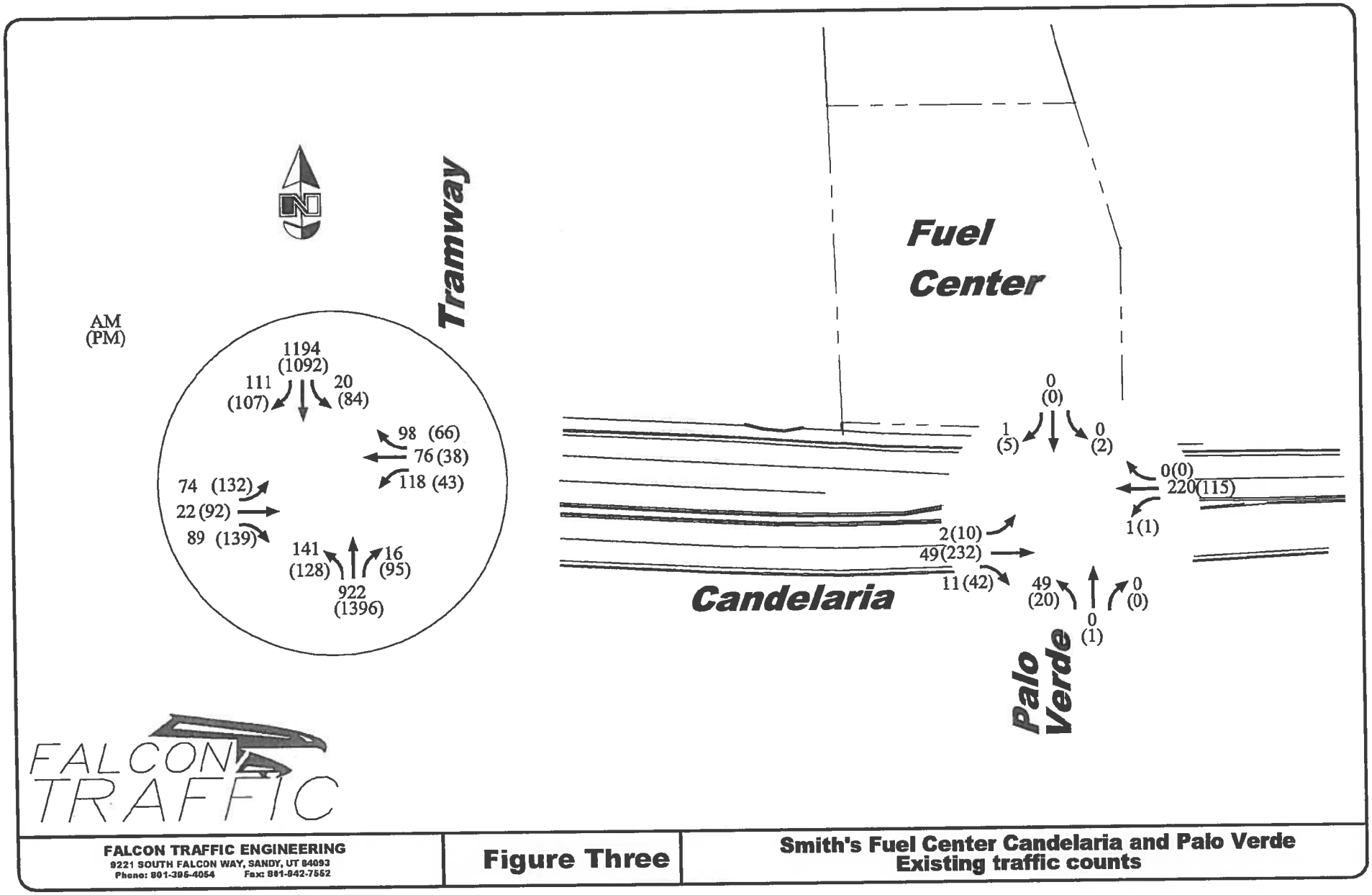

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Figure Three

Smith's Fuel Center Candelaria and Palo Verde
Existing traffic counts

III. Trip Generation

The Institute of Transportation Engineers (ITE) Trip Generation (Eighth Edition) handbook was used to estimate trips for the land uses. The proposed land uses are noted in the following list by type and size.

- Smith's Fuel Center 10 Fueling Positions

Tables One through Two show the AM/PM peak hour trips generated.

Smith's Fuel Center –
Candelaria Road and Palo Verde Drive Traffic Study
Table One
Peak Hour Trip Generation

Facility	ITE Land Use	Fueling Positions	Trip Rate	Trips
AM Peak Hour				
Smith's Fuel Center	944	10	12.07	121
PM Peak Hour				
Smith's Fuel Center	944	10	13.86	139

Smith's Fuel Center –
Candelaria Road and Palo Verde Drive Traffic Study
Table Two
Peak Hour Total Development Trips and Primary Trips

Facility	External Trips	Percent In	Percent Out	Total In	Total Out
AM Peak Hour					
Smith's Fuel Center	121	50%	50%	61	61
PM Peak Hour					
Smith's Fuel Center	139	50%	50%	70	70

IV. Origin/Destination and Trip Distribution

Based on the existing intersection and access counts, the following origin/destination assumptions were made:

- North 50%
- South 20%
- East 15%
- West 15%

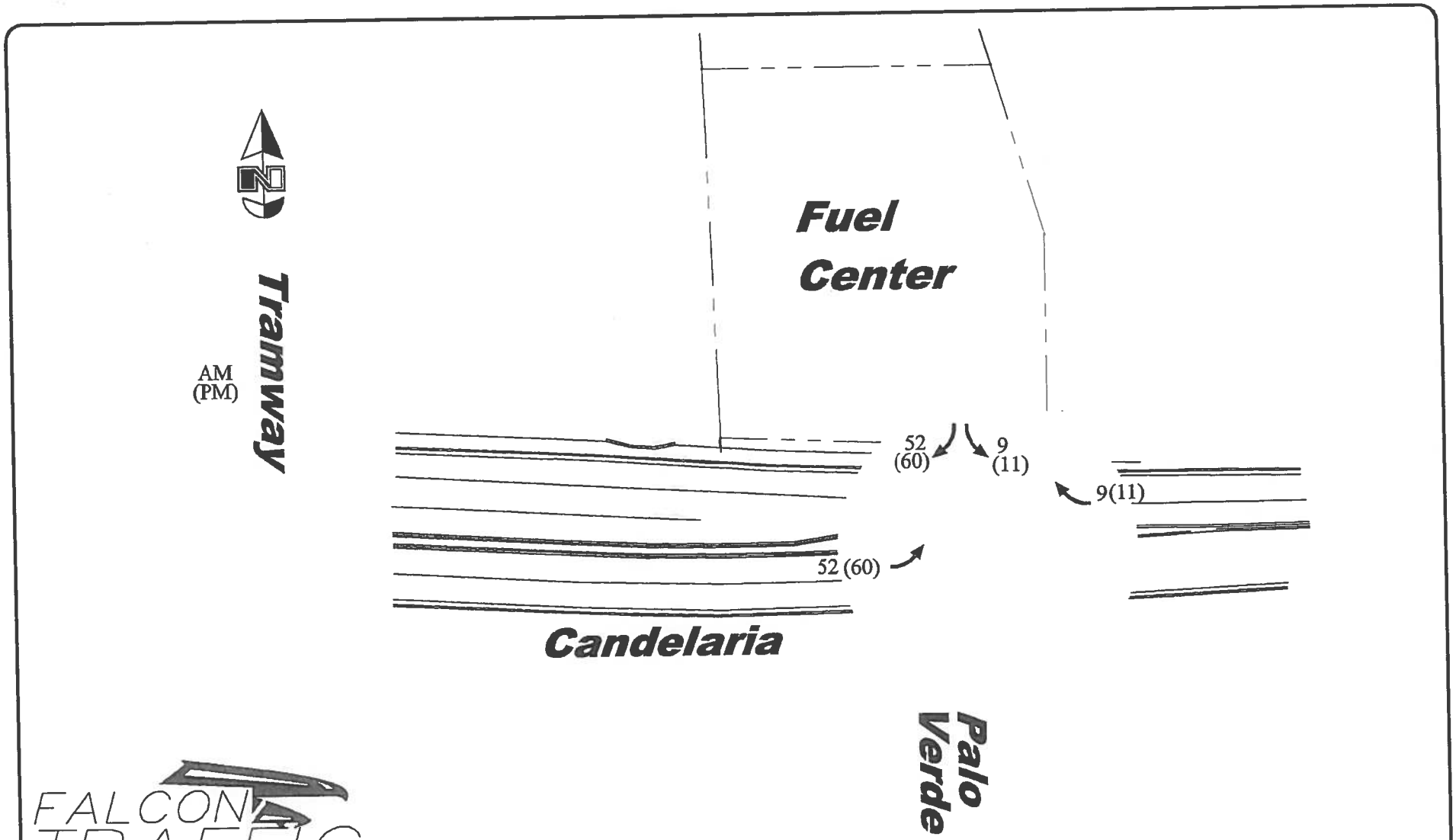
Table Three shows the projected site generated traffic.

Smith's Fuel Center –
Candelaria Road and Palo Verde Drive Traffic Study
Table Three
Site Generated Traffic

	Tramway and Calendaria						Site Access			
	In			Out			In		Out	
	SB Left	EB Thru	NB Right	WB Left	WB Thru	WB Right	EB Left	WB Right	SB Left	SB Right
AM Peak										
	31	9	12	12	9	31	52	9	9	52
PM Peak										
	35	11	14	14	11	35	60	11	11	60

Figure Four shows the projected site generated traffic.

Figure Five shows the projected site generated traffic plus the existing traffic.



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FALCON TRAFFIC ENGINEERING 9221 SOUTH FALCON WAY, SANDY, UT 84093 Phone: 801-395-4054 Fax: 801-942-7552	**Figure Four**	**Smith's Fuel Center Candelaria and Palo Verde** **Site Generated Traffic**

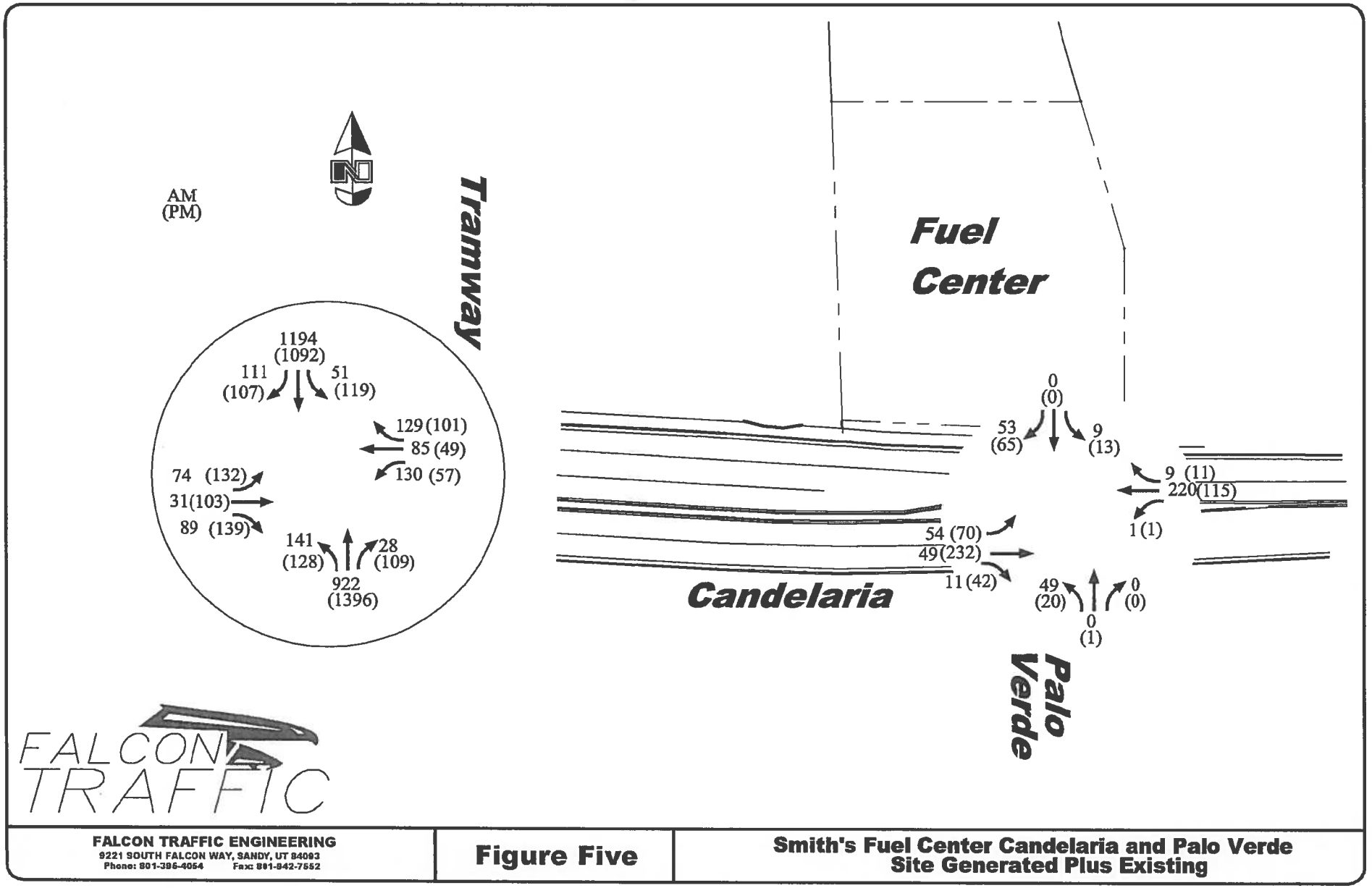

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Figure Five

Smith's Fuel Center Candelaria and Palo Verde
Site Generated Plus Existing

V. Traffic Analysis

The unsignalized and signalized accesses and intersections are analyzed using the Synchro software to evaluate the impacts of the project on the surrounding traffic network. For the level of service analysis, the current striping and signing conditions were assumed as in Alternative One. Table Four shows the Level of Service delay ranges for unsignalized/signalized intersections.

Smith's Fuel Center –
Candelaria Road and Palo Verde Drive Traffic Study
Table Four
Intersection LOS-Delay Relationship

Level of Service	Unsignalized	Signalized
A	≤ 5.0	≤10.0
B	> 5.0 and ≤ 15.0	>10.0 and ≤20.0
C	> 15.0 and ≤ 25.0	>20.0 and ≤35.0
D	> 25.0 and ≤ 35.0	> 35.0 and ≤ 55.0
E	> 35.0 and ≤ 45.0	> 55.0 and ≤ 80.0
F	> 45.0	> 80.0

A. Accesses to the Fuel Center

Table Five shows the HCM Delay / LOS Evaluation for the Candelaria Road access and Palo Verde intersection to the development. Detailed data can be seen in the HCS Analysis in Appendix B.

Smith's Fuel Center –
Candelaria Road and Palo Verde Drive Traffic Study
Table Five
HCM AM/PM Peak Period Access Analysis –
Delay/LOS Evaluation with Site Trips

Delay / LOS (in sec)	Candelaria Access (AM Existing)	Candelaria Access (AM with Site)	Candelaria Access (PM Existing)	Candelaria Access (PM With Site)
Eastbound Left	0.6/A	5.5/A	0.6/A	3.1/A
Westbound Left	0.1/A	0.1/A	0.1/A	0.1/A
Northbound Left	10.1/B	12.7/B	11.7/B	15.5/C
Southbound Left	0.0/A	12.0/B	10.6/B	12.4/B
Southbound Thru/Right	9.0/A	9.3/A	8.7/A	9.0/A

The unsignalized analysis for these accesses shows that the proposed fuel center will not have a significant negative affect on traffic service levels.

B. Tramway Boulevard and Calendaria Road

Table Six shows the Tramway Boulevard and Calendaria Road intersection with both existing traffic and the projected opening day traffic analyzed with the Synchro analysis. Signal cycle lengths and phasing were based on information from the City of Albuquerque. Detailed data can be seen in Appendix B.

Smith's Fuel Center –
Candelaria Road and Palo Verde Drive Traffic Study
Table Six
HCM Delay / LOS Analysis for Signalized Intersection

Delay / LOS (in sec)	**Tramway Boulevard and Candelaria Road**			
	Existing (AM)	**With Site (AM)**	**With Site (AM)**	**With Site (PM)**
Eastbound Left	34.9/C	34.4/C	38.7/D	37.4/D
Eastbound Thru/Right	13.6/B	14.7/B	19.2/B	20.1/C
Westbound Left	36.4/D	36.3/D	35.0/D	34.9/C
Westbound Thru	46.4/D	46.0/D	46.9/D	46.6/D
Westbound Right	8.9/A	7.8/A	11.0/B	8.9/A
Northbound Left	7.3/A	7.9/A	5.0/A	5.4/A
Northbound Thru	9.2/A	11.6/B	13.5/B	15.5/B
Northbound Right	4.1/A	3.7/A	3.6/A	3.7/A
Southbound Left	5.6/A	5.8/A	9.5/A	15.5/B
Southbound Thru	14.4/B	14.8/B	12.3/B	13.3/B
Southbound Right	3.1/A	3.2/B	2.4/A	2.5/A
Intersection	13.9/B	14.8/B	14.0/B	15.4/B

The analysis for the Tramway Boulevard and Candelaria Road shows that the proposed fuel center will not have a significant negative affect on traffic service levels.

C. Queue Analysis

From the Synchro software, projected queue lengths are provided. The critical movements for this study are the eastbound left turn into the site. For the intersection the critical movements include the southbound left turn and the northbound right turn, as well as the westbound left, through and right turn movements. The 95 percentile queue is shown below. For available storage lengths please see the attached full size site plan with dimensions:

Eastbound Left Turn at Palo Verde	**Projected Queue Length**		**Stacking Space**
	Existing(ft)	**With Site (ft)**	**Available (ft)**
AM Peak	0	4	30*
PM Peak	1	4	30*

*Alternative Three only. Other alternatives provide additional stacking space

Westbound Left Turn at Tramway			
AM Peak	127	137	143
PM Peak	57	36	143
Westbound Thru at Tramway			
AM Peak	104	111	143
PM Peak	61	36	143
Westbound Right Turn at Tramway			
AM Peak	51	56	143
PM Peak	43	52	143
Southbound Left Turn at Tramway			
AM Peak	13	26	177
PM Peak	57	96	177
Northbound Right Turn at Tramway			
AM Peak	10	13	240
PM Peak	32	35	240

D. Alternatives Analysis

There was concern voiced from local residents about traffic, so this study and alternatives analysis has been completed. The above analysis shows that from a traffic perspective, the addition of a Smith's Fuel Center will not have an adverse impact. For the purposes of this study, several alternative lane configurations were considered. None of the lane configurations change the above traffic analysis significantly. The alternatives presented work from a traffic and level-of-service standpoint. These are presented conceptually for the City and DOT so they can indicate what their preferences are with respect to lanes configurations, signing and striping. The lane configurations shown in the alternatives are conceptual for review purposes.

Alternative 1 – No Action Alternative – Eastbound Left/Thru and Thru/Right Lanes

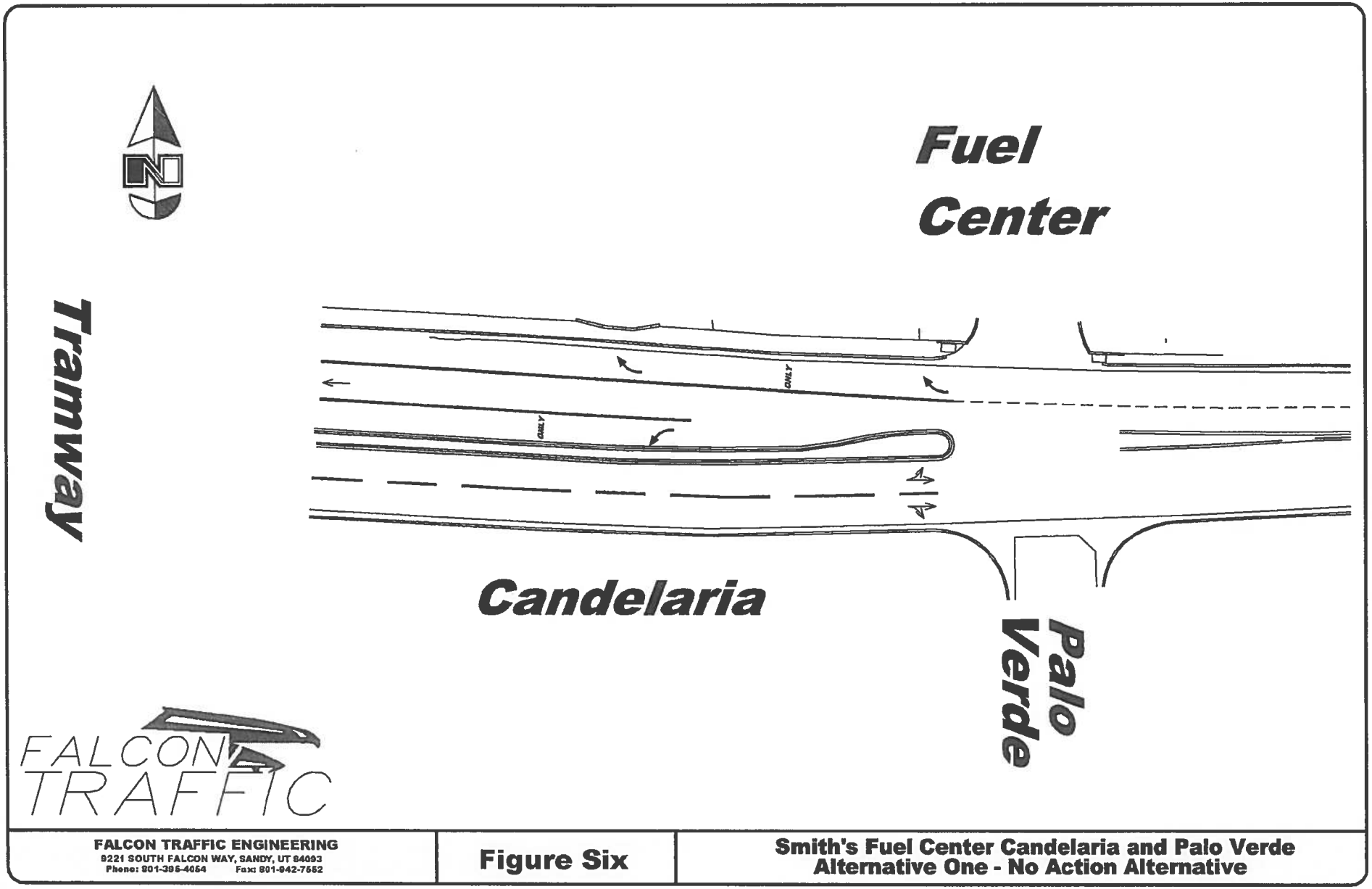
Alternative 1 assumes that the travel lanes remain as presently configured. This has two lanes eastbound, a left/thru lane and right/thru lane. The thru lanes merge into one immediately after Palo Verde Drive. There is signing that indicates a merge ahead for the outside lane. This alternative does not provide for an exclusive left turn lane into the site. As traffic volumes are not considerably high on Candelaria Road, the eastbound left turns into the Smith's Fuel Center access are not projected to have high levels of delay or queuing. If the City feels comfortable with this current configuration and how it has operated, it is felt that additional traffic from the Smith's Fuel Center should not be an issue. Figure Six shows this alternative.

Alternative 2 – Signing/Striping Alternative – Exclusive Eastbound Left Turn Lane and Thru/Right Lanes

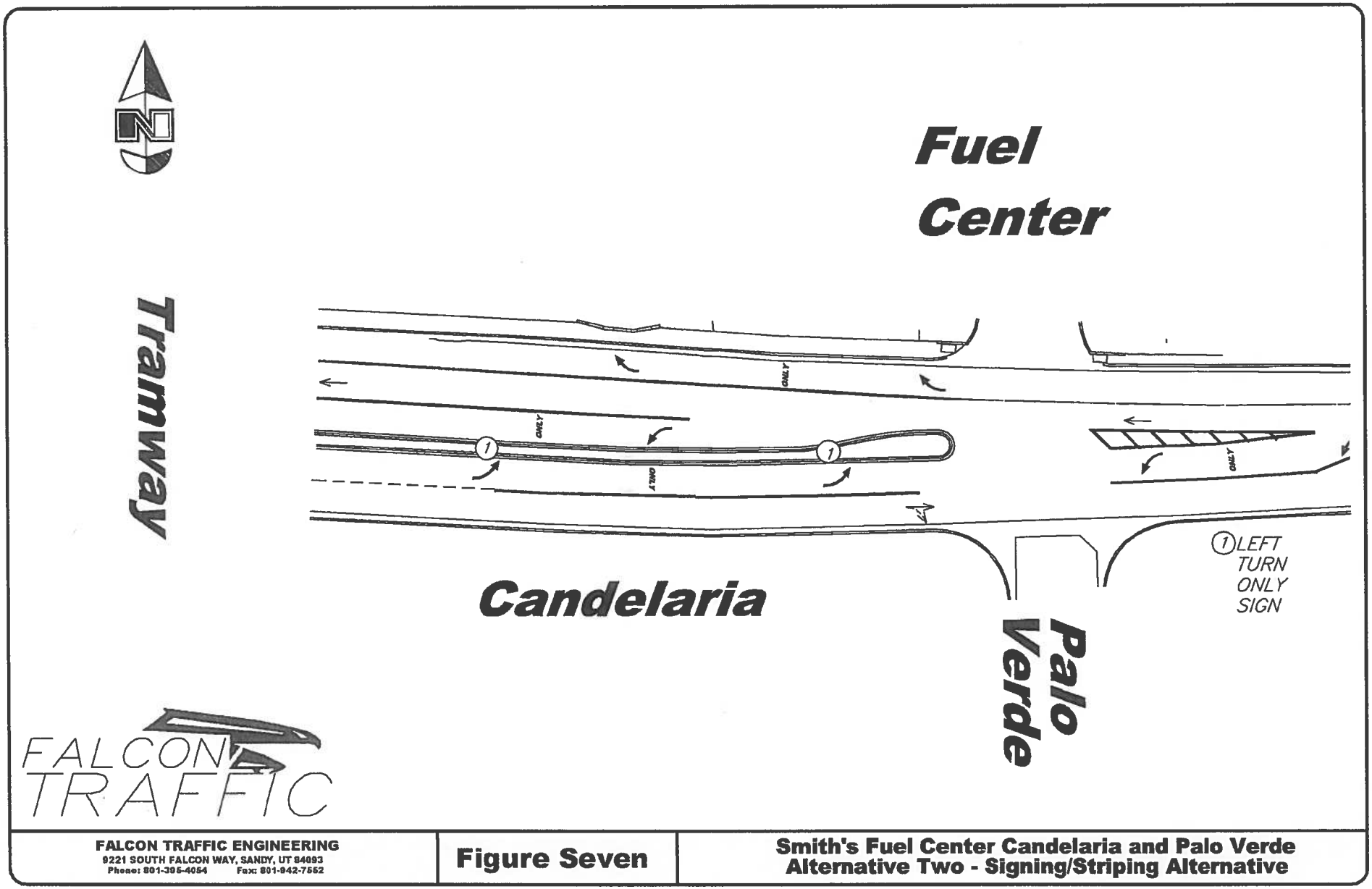
Alternative 2 does not involve any structural reconfiguration of the roadway or islands. This would take the eastbound inside lane (that currently has no restrictions) and restrict it as a left turn only. This could be done by adding a "Left Turn Only" sign in the island median starting 50 – 100 feet to the west of the Tramway/Candelaria Intersection. An additional "Left Turn Only" could be located further to the east. Left turn arrows could also be painted inside this lane. While signage/striping for the thru/right turn lane is not considered here, this could be included at the City's direction. There would be vehicles that would have to merge from the inside left turn lane to the outside lane if they wished to go straight or right while traveling eastbound. This merge is the main difference over what is currently in place. Figure Seven shows this alternative.

Alternative 3 – Island Reconfiguration Alternative – Eastbound Left Turn Pocket, a Through Lane and a Through/Right Turn lane

It can be seen from the previous two alternatives that there is additional width near the eastbound left turn into the Smith's access. This width is taken up with a bulb on the existing island. In looking at the width of the intersection near the project access, it can be seen that there is enough width to add a exclusive left turn pocket that will allow eastbound left turns to queue (if the westbound right turn storage lane at the Tramway/Calendaria signal is shortened to a reasonable level). To alleviate having to impact the queue lengths available for the back-to-back left turn (the westbound left turn pocket for the Tramway/Calendaria Intersection), it is felt that this bulb/island could be eliminated for approximately 50 feet and replaced with an islanded left turn pocket. This would continue to provide the 140 feet of stacking that is required for the westbound left turn lane.



FALCON TRAFFIC ENGINEERING 9221 SOUTH FALCON WAY, SANDY, UT 84093 Phone: 801-395-4054 Fax: 801-942-7552	**Figure Six**	**Smith's Fuel Center Candelaria and Palo Verde** **Alternative One - No Action Alternative**



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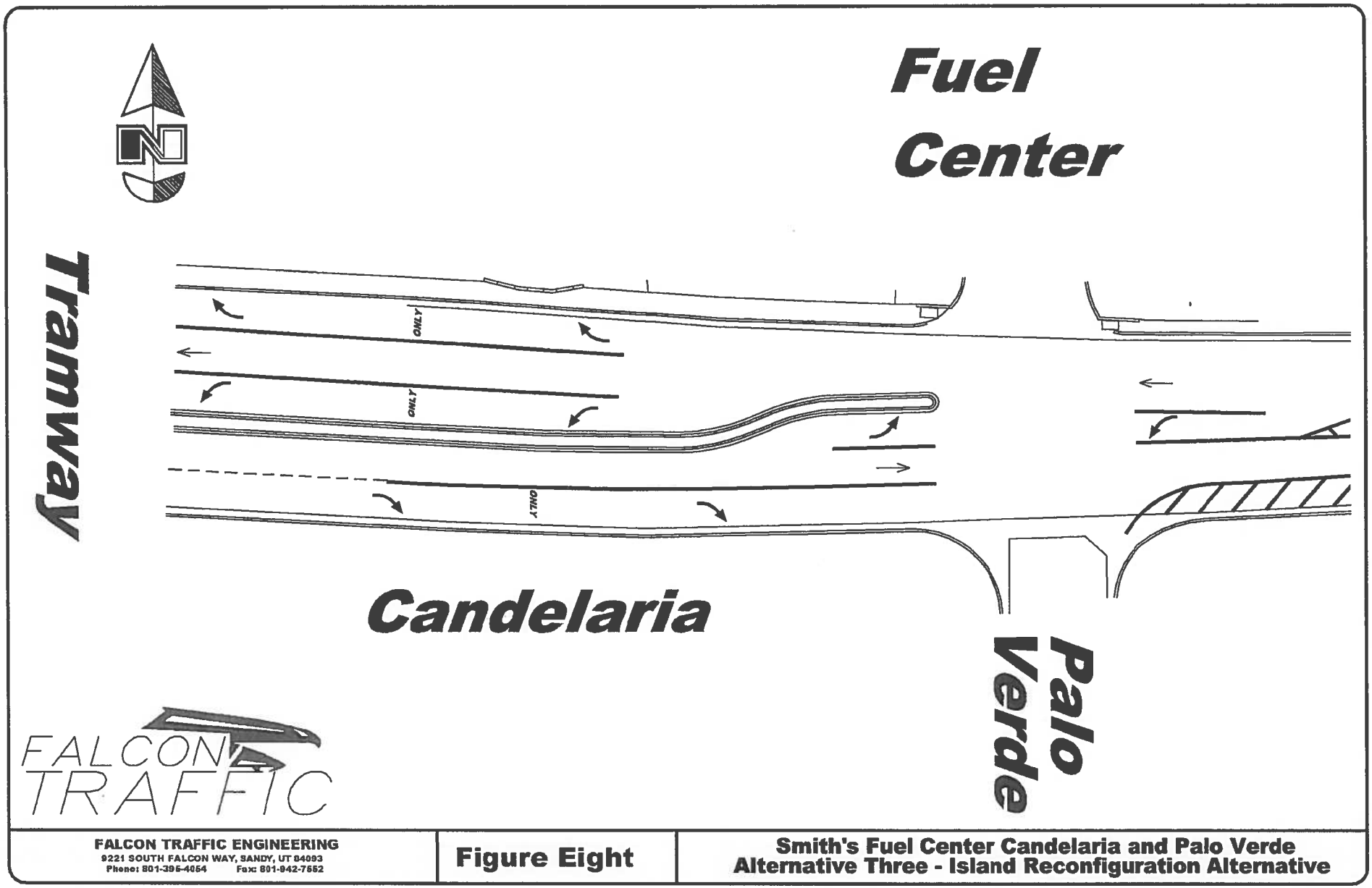
FALCON TRAFFIC ENGINEERING 9221 SOUTH FALCON WAY, SANDY, UT 84093 Phone: 801-395-4054 Fax: 801-942-7552	**Figure Seven**	**Smith's Fuel Center Candelaria and Palo Verde** **Alternative Two - Signing/Striping Alternative**



FALCON TRAFFIC ENGINEERING
9221 SOUTH FALCON WAY, SANDY, UT 84093
Phone: 801-396-4054 Fax: 801-942-7552

Figure Eight

Smith's Fuel Center Candelaria and Palo Verde
Alternative Three - Island Reconfiguration Alternative

VI. Conclusions

The results of the study show that the intersections operate at an acceptable level of service. This study is meant to provide the City and DOT with alternatives to determine which lane configuration alternative best fits the City's typical striping/signing/lane configurations and driver's expectations. As part of this study, it is recommended that:

- All improvements, signing and striping must conform with the City of Albuquerque Drawings, other City requirements, AASHTO, or MUTCD, as appropriate.
- The access to the site has been shown to operate at a reasonable level of service with the addition of the fuel center.
- The internal stacking available for the Fuel Center access is projected to be adequate.
- The alternatives for Calendaria Road show that either the "No Action Alternative" or either of the restriping or reconfiguration alternatives work from a traffic standpoint. The alternatives were presented to give the City different options so that they can indicate their preferences with respect to striping, signing and lane configuration.

APPENDICES

Appendix A	Traffic Counts
Appendix B	HCM Traffic Analyses

Appendix A Traffic Counts

File Name: C:\Users\Sandy\Desktop\Candelaria_Palo Verde2.PPD
Start Date: 01/26/2012
Start Time: 7:00:00 AM
Site Code: 00000000
Comment 1: Default Comments
Comment 2: Change These in The Preferences Window
Comment 3: Select File/Preference in the Main Scree
Comment 4: Then Click the Comments Tab

	PALO VERDE From North				CANDELARIA From East				PALO VERDE From South				CANDELARIA From West					
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds		
07:00 AM	0	0	0	0	0	46	1	0	0	0	12	0	2	11	1	0	73	333
07:15 AM	1	0	0	0	0	51	0	0	0	0	18	0	0	7	1	0	78	335
07:30 AM	0	0	0	0	0	71	0	0	0	0	10	0	2	18	0	0	101	
07:45 AM	0	0	0	0	0	52	0	0	0	0	9	0	7	13	0	0	81	
08:00 AM	0	0	0	0	0	49	0	0	0	0	6	0	2	17	1	0	75	
08:15 AM	1	0	0	0	0	45	0	0	0	0	12	0	4	10	1	0	73	
08:30 AM	1	0	0	0	0	46	0	0	0	0	10	0	5	12	3	0	77	
08:45 AM	0	0	0	0	1	33	0	0	0	0	10	0	0	15	0	0	59	
	1	0	0	0	0	220	1	0	0	0	49	0	11	49	2	0	333	
04:00 PM	4	2	0	0	0	34	0	0	0	0	6	0	5	36	4	0	91	
04:15 PM	2	2	0	0	0	24	1	0	0	0	1	0	1	42	6	0	79	
04:30 PM	0	0	0	0	0	28	1	0	0	0	4	0	8	44	1	0	86	
04:45 PM	0	0	0	0	0	29	0	0	0	0	5	0	6	59	1	0	100	
05:00 PM	2	0	0	0	0	26	0	0	0	0	5	0	11	49	4	0	97	
05:15 PM	1	0	2	0	0	33	0	0	0	1	3	0	7	57	2	0	106	
05:30 PM	2	0	0	0	0	27	1	0	0	0	7	0	18	67	3	0	125	428
05:45 PM	0	0	0	0	0	22	0	0	0	0	15	0	10	62	0	0	109	437
	5	0	2	0	0	115	1	0	0	1	20	0	42	232	10	0	428	

File Name: C:\Users\Sandy\Desktop\Tramway_Candelaria.PPD
Start Date: 01/26/2012
Start Time: 7:00:00 AM
Site Code: 00000000
Comment 1: Default Comments
Comment 2: Change These in The Preferences Window
Comment 3: Select File/Preference in the Main Scree
Comment 4: Then Click the Comments Tab

	TRAMWAY From North				CANDELARIA From East				TRAMWAY From South				CANDELARIA From West			
Start Time	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds	Right	Thru	Left	Peds
07:00 AM	17	289	6	0	33	12	24	0	4	256	19	0	17	2	19	0
07:15 AM	19	313	5	0	26	22	24	0	1	186	43	0	27	4	18	0
07:30 AM	44	334	3	0	21	21	39	0	6	284	36	0	27	5	24	0
07:45 AM	31	258	6	0	18	21	31	0	5	196	43	0	18	11	13	0
08:00 AM	34	229	5	0	16	15	18	0	2	158	53	0	35	4	19	0
08:15 AM	21	211	5	0	16	12	28	0	3	190	40	0	28	3	15	0
08:30 AM	23	198	6	0	12	21	14	0	2	183	42	0	26	5	15	0
08:45 AM	12	190	6	0	11	11	10	0	3	155	25	0	26	7	25	0
09:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	38	248	12	0	7	7	8	0	17	236	30	0	29	21	42	0
04:15 PM	42	221	15	0	14	10	9	0	11	241	21	0	30	20	34	0
04:30 PM	14	256	27	0	13	6	8	0	18	270	33	0	36	16	37	0
04:45 PM	34	271	17	0	19	13	5	0	23	296	34	0	33	23	31	0
05:00 PM	30	291	16	0	19	10	14	0	14	363	32	0	45	27	37	0
05:15 PM	23	275	25	0	14	8	9	0	36	367	33	0	30	23	38	0
05:30 PM	20	255	26	0	14	7	15	0	22	370	29	0	31	19	26	0
05:45 PM	23	206	26	0	15	11	11	0	17	231	22	0	20	24	29	0

COORDINATION TIMING PLAN DATA

Intersection # and Name: **914 - Candelaria & Tramway**

COORDINATOR OPTIONS

SPLIT UNITS	%	ACT CRD PHASE	X
OFFSET UNITS	%	ACT WALK/REST	.
INTERCNT FMT	PLAN	INHIBIT MAX	X
INTERCNT SRC	NIC	MAX2 SELECT	.
RESYNC COUNT	0	MULTISYNC	.
TRANSITION	SMOOTH	FLOAT FORCE OFF	.
DEWLL PERIOD	0%		

	A	B	C	D	E	F
FREE ALT SEQUENCE						

COORDINATION PATTERN DATA PATTERN 1

CYCLE LENGTH: 110 PLAN: 21
OFFSET: 95

PHASE	1	2	3	4
DIRECTION	S-E	NB	W-S	EB
SPLITS	8	63	11	18

PHASE	5	6	7	8
DIRECTION	N-W	SB	E-N	WB
SPLITS	14	57	11	18

PHASE	1	2	3	4	5	6	7	8
COORD PHASE		X				X		
VEH RECALL								
MAX RECALL		X				X		

	A	B	C	D	E	F
ALT SEQUENCE						

COORDINATION PATTERN DATA PATTERN 3

CYCLE LENGTH: 110 PLAN: 23
OFFSET: 4

PHASE	1	2	3	4
DIRECTION	S-E	NB	W-S	EB
SPLITS	9	62	11	18

PHASE	5	6	7	8
DIRECTION	N-W	SB	E-N	WB
SPLITS	9	62	11	18

PHASE	1	2	3	4	5	6	7	8
COORD PHASE		X				X		
VEH RECALL								
MAX RECALL		X				X		

	A	B	C	D	E	F
ALT SEQUENCE						

COORDINATION TIMING PLAN DATA

COORDINATION PATTERN DATA PATTERN 5

CYCLE LENGTH	110						PLAN	25
OFFSET	98							

PHASE	1	2	3	4
DIRECTION	S-E	NB	W-S	EB
SPLITS	10	46	9	35

PHASE	5	6	7	8
DIRECTION	N-W	SB	E-N	WB
SPLITS	11	45	9	35

PHASE	1	2	3	4	5	6	7	8
COORD PHASE		X				X		
VEH RECALL								
MAX RECALL		X				X		

	A	B	C	D	E	F
ALT SEQUENCE						

CLOCK / CALENDAR

DATE SET:	CURRENT DATE
TIME SET:	CURRENT TIME

SYNC REFERENCE TIME: 3:30

WEEKLY PROGRAM

WEEK	SUN	MON	TUE	WED	THU	FRI	SAT
1	1	2	2	2	2	2	3
2	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1
5	1	1	1	1	1	1	1
6	1	1	1	1	1	1	1
7	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1
9	1	1	1	1	1	1	1
10	1	1	1	1	1	1	1

NIC PROGRAM STEPS

STEP	PGM	TIME	PATTERN
1	1	7:00	3
2	1	22:00	0
3	2	6:30	21
4	2	9:00	23
5	2	15:00	25
6	2	18:30	23
7	2	22:00	0
8	3	7:00	3
9	3	22:00	0

Appendix B HCM Traffic Analyses

HCM Unsignalized Intersection Capacity Analysis AM Existing Access
4: Int 1/29/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	2	49	11	1	220	0	49	0	0	0	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	2	53	12	1	239	0	53	0	0	0	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		315										
pX, platoon unblocked												
vC, conflicting volume	239			65			186	305	33	272	311	120
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	239			65			186	305	33	272	311	120
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			93	100	100	100	100	100
cM capacity (veh/h)	1325			1535			755	606	1034	657	601	909

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	29	39	121	120	53	0	0	1
Volume Left	2	0	1	0	53	0	0	0
Volume Right	0	12	0	0	0	0	0	1
cSH	1325	1700	1535	1700	755	1700	1700	909
Volume to Capacity	0.00	0.02	0.00	0.07	0.07	0.00	0.00	0.00
Queue Length (ft)	0	0	0	0	6	0	0	0
Control Delay (s)	0.6	0.0	0.1	0.0	10.1	0.0	0.0	9.0
Lane LOS	A		A		B	A	A	A
Approach Delay (s)	0.3		0.0		10.1		9.0	
Approach LOS					B		A	

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	16.7%	ICU Level of Service	A

AM with Site Access

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑		↰	↑	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	54	49	11	1	220	9	49	0	0	9	0	53
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	59	53	12	1	239	10	53	0	0	10	0	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		315										
pX, platoon unblocked												
vC, conflicting volume	249			65			356	428	33	390	429	124
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	249			65			356	428	33	390	429	124
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			90	100	100	98	100	94
cM capacity (veh/h)	1314			1535			519	494	1034	524	494	903

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	85	39	121	129	53	0	10	58
Volume Left	59	0	1	0	53	0	10	0
Volume Right	0	12	0	10	0	0	0	58
cSH	1314	1700	1535	1700	519	1700	524	903
Volume to Capacity	0.04	0.02	0.00	0.08	0.10	0.00	0.02	0.06
Queue Length (ft)	4	0	0	0	9	0	1	5
Control Delay (s)	5.5	0.0	0.1	0.0	12.7	0.0	12.0	9.3
Lane LOS	A		A		B	A	B	A
Approach Delay (s)	3.8		0.0		12.7		9.7	
Approach LOS					B		A	

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	17.2%	ICU Level of Service	A

HCM Unsignalized Intersection Capacity Analysis PM Existing Access
4: Int 1/29/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱		↰	↱	
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	10	232	42	1	115	0	20	1	0	2	0	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	11	252	46	1	125	0	22	1	0	2	0	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		315										
pX, platoon unblocked												
vC, conflicting volume	125			298			367	424	149	276	447	62
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	125			298			367	424	149	276	447	62
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			96	100	100	100	100	99
cM capacity (veh/h)	1459			1260			558	516	871	650	501	989

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	137	172	64	62	22	1	2	5
Volume Left	11	0	1	0	22	0	2	0
Volume Right	0	46	0	0	0	0	0	5
cSH	1459	1700	1260	1700	558	516	650	989
Volume to Capacity	0.01	0.10	0.00	0.04	0.04	0.00	0.00	0.01
Queue Length (ft)	1	0	0	0	3	0	0	0
Control Delay (s)	0.6	0.0	0.1	0.0	11.7	12.0	10.6	8.7
Lane LOS	A		A		B	B	B	A
Approach Delay (s)	0.3		0.1		11.7		9.2	
Approach LOS					B		A	

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	19.3%	ICU Level of Service	A

PM with Site Access

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	70	232	42	1	115	11	20	1	0	13	0	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (veh/h)	76	252	46	1	125	12	22	1	0	14	0	71
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		315										
pX, platoon unblocked												
vC, conflicting volume	137			298			562	566	149	412	583	68
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	137			298			562	566	149	412	583	68
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			100			94	100	100	97	100	93
cM capacity (veh/h)	1445			1260			364	409	871	502	400	981

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	202	172	64	74	22	1	14	71
Volume Left	76	0	1	0	22	0	14	0
Volume Right	0	46	0	12	0	0	0	71
cSH	1445	1700	1260	1700	364	409	502	981
Volume to Capacity	0.05	0.10	0.00	0.04	0.06	0.00	0.03	0.07
Queue Length (ft)	4	0	0	0	5	0	2	6
Control Delay (s)	3.1	0.0	0.1	0.0	15.5	13.8	12.4	9.0
Lane LOS	A		A		C	B	B	A
Approach Delay (s)	1.7		0.1		15.4		9.5	
Approach LOS					C		A	

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	28.9%	ICU Level of Service	A

AM Existing Traffic

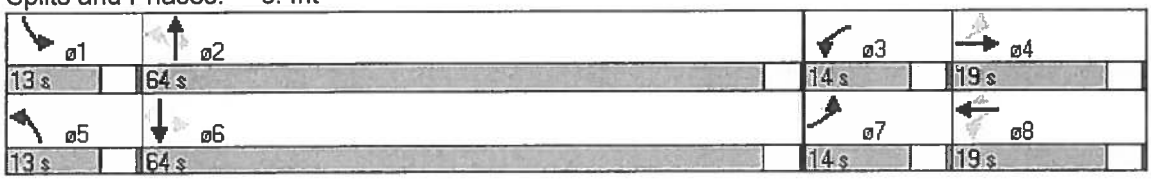
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		250	150		0	300		180	175		175
Storage Lanes	1		1	1		1	1		1	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.880				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3115	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.675			0.675			0.118			0.206		
Satd. Flow (perm)	1257	3115	0	1257	1863	1583	220	3539	1583	384	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		97				107			17			102
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		293			315			341			427	
Travel Time (s)		6.7			7.2			7.8			9.7	
Volume (vph)	74	22	89	118	76	98	141	922	16	20	1194	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	24	97	128	83	107	153	1002	17	22	1298	121
Lane Group Flow (vph)	80	121	0	128	83	107	153	1002	17	22	1298	121
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phases	7	4		3	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0		8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	14.0	19.0	0.0	14.0	19.0	19.0	13.0	64.0	64.0	13.0	64.0	64.0
Total Split (%)	13%	17%	0%	13%	17%	17%	12%	58%	58%	12%	58%	58%
Maximum Green (s)	10.0	15.0		10.0	15.0	15.0	9.0	60.0	60.0	9.0	60.0	60.0
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Coord	Coord	None	Coord	Coord
Walk Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0			11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0			0	0		0	0		0	0
Act Effct Green (s)	18.2	9.5		20.3	12.3	12.3	78.4	74.8	74.8	72.8	66.9	66.9
Actuated g/C Ratio	0.17	0.09		0.18	0.11	0.11	0.71	0.68	0.68	0.66	0.61	0.61
v/c Ratio	0.32	0.34		0.46	0.40	0.39	0.57	0.42	0.02	0.07	0.60	0.12
Uniform Delay, d1	35.5	9.0		36.4	45.4	0.0	5.0	9.3	0.0	5.1	13.8	1.4
Delay	34.9	13.6		36.4	46.4	8.9	7.3	9.2	4.1	5.6	14.4	3.1
LOS	C	B		D	D	A	A	A	A	A	B	A
Approach Delay		22.1			29.7			8.9			13.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			A			B	
Queue Length 50th (ft)	47	8		77	57	0	30	131	0	4	284	5
Queue Length 95th (ft)	85	36		127	104	51	73	260	10	13	396	32
Internal Link Dist (ft)		213			235			261			347	
50th Up Block Time (%)												
95th Up Block Time (%)								3%			9%	
Turn Bay Length (ft)	150			150			300		180	175		175
50th Bay Block Time %											18%	
95th Bay Block Time %											26%	
Queuing Penalty (veh)											5	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 13.9 Intersection LOS: B
Intersection Capacity Utilization 68.6% ICU Level of Service B

Splits and Phases: 3: Int



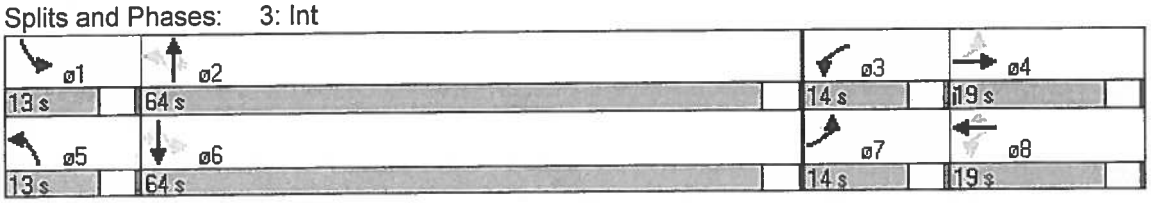
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		250	150		0	300		180	175		175
Storage Lanes	1		1	1		1	1		1	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.889				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3146	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.645			0.669			0.118			0.206		
Satd. Flow (perm)	1201	3146	0	1246	1863	1583	220	3539	1583	384	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		97				140			30			102
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		293			315			341			427	
Travel Time (s)		6.7			7.2			7.8			9.7	
Volume (vph)	74	31	89	130	85	129	141	922	28	51	1194	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	80	34	97	141	92	140	153	1002	30	55	1298	121
Lane Group Flow (vph)	80	131	0	141	92	140	153	1002	30	55	1298	121
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phases	7	4		3	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0		8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	14.0	19.0	0.0	14.0	19.0	19.0	13.0	64.0	64.0	13.0	64.0	64.0
Total Split (%)	13%	17%	0%	13%	17%	17%	12%	58%	58%	12%	58%	58%
Maximum Green (s)	10.0	15.0		10.0	15.0	15.0	9.0	60.0	60.0	9.0	60.0	60.0
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Coord	Coord	None	Coord	Coord
Walk Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0			11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0			0	0		0	0		0	0
Act Effct Green (s)	18.7	9.9		20.9	12.9	12.9	76.5	69.7	69.7	72.9	66.3	66.3
Actuated g/C Ratio	0.17	0.09		0.19	0.12	0.12	0.70	0.63	0.63	0.66	0.60	0.60
v/c Ratio	0.32	0.35		0.50	0.42	0.45	0.57	0.45	0.03	0.16	0.61	0.12
Uniform Delay, d1	35.0	11.8		36.2	45.1	0.0	5.2	11.1	0.0	5.1	14.2	1.4
Delay	34.4	14.7		36.3	46.0	7.8	7.9	11.6	3.7	5.8	14.8	3.2
LOS	C	B		D	D	A	A	B	A	A	B	A
Approach Delay		22.2			28.0			10.9			13.5	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	46	11		85	63	0	30	187	0	10	289	5
Queue Length 95th (ft)	85	40		137	111	56	76	272	13	26	403	33
Internal Link Dist (ft)		213			235			261			347	
50th Up Block Time (%)												
95th Up Block Time (%)								5%			9%	
Turn Bay Length (ft)	150			150			300		180	175		175
50th Bay Block Time %											18%	
95th Bay Block Time %											27%	
Queuing Penalty (veh)											12	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.61
Intersection Signal Delay: 14.8 Intersection LOS: B
Intersection Capacity Utilization 69.6% ICU Level of Service B

Splits and Phases: 3: Int



PM Existing Tramway

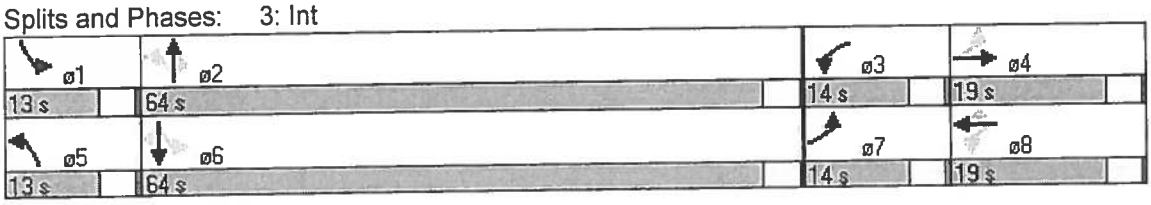
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		250	150		0	300		180	175		175
Storage Lanes	1		1	1		1	1		1	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.910				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3221	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.730			0.456			0.148			0.069		
Satd. Flow (perm)	1360	3221	0	849	1863	1583	276	3539	1583	129	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		151				72			76			107
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		293			315			341			427	
Travel Time (s)		6.7			7.2			7.8			9.7	
Volume (vph)	132	92	139	43	38	66	128	1396	95	84	1092	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	100	151	47	41	72	139	1517	103	91	1187	116
Lane Group Flow (vph)	143	251	0	47	41	72	139	1517	103	91	1187	116
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phases	7	4		3	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0		8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	14.0	19.0	0.0	14.0	19.0	19.0	13.0	64.0	64.0	13.0	64.0	64.0
Total Split (%)	13%	17%	0%	13%	17%	17%	12%	58%	58%	12%	58%	58%
Maximum Green (s)	10.0	15.0		10.0	15.0	15.0	9.0	60.0	60.0	9.0	60.0	60.0
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Coord	Coord	None	Coord	Coord
Walk Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0			11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0			0	0		0	0		0	0
Act Effct Green (s)	18.3	10.3		15.1	8.4	8.4	79.1	72.4	72.4	77.1	69.9	69.9
Actuated g/C Ratio	0.17	0.09		0.14	0.08	0.08	0.72	0.66	0.66	0.70	0.64	0.64
v/c Ratio	0.54	0.57		0.26	0.29	0.38	0.46	0.65	0.10	0.46	0.53	0.11
Uniform Delay, d1	39.2	18.6		37.2	49.0	0.0	4.2	12.2	1.9	4.5	11.4	0.6
Delay	38.7	19.2		35.0	46.9	11.0	5.0	13.5	3.6	9.5	12.3	2.4
LOS	D	B		D	D	B	A	B	A	A	B	A
Approach Delay		26.3			27.2			12.3			11.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	89	35		28	28	0	25	337	7	16	233	2
Queue Length 95th (ft)	142	74		57	61	43	52	497	32	57	337	27
Internal Link Dist (ft)		213			235			261			347	
50th Up Block Time (%)								11%				
95th Up Block Time (%)								22%			2%	
Turn Bay Length (ft)	150			150			300		180	175		175
50th Bay Block Time %								7%			12%	
95th Bay Block Time %	1%							19%			23%	
Queuing Penalty (veh)								18			16	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 14.0 Intersection LOS: B
Intersection Capacity Utilization 71.6% ICU Level of Service C

Splits and Phases: 3: Int



PM with Site Tramway

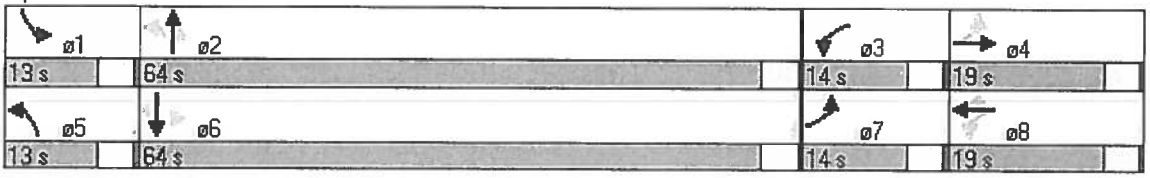
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		250	150		0	300		180	175		175
Storage Lanes	1		1	1		1	1		1	1		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	50	50	50	50	50
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.914				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3235	0	1770	1863	1583	1770	3539	1583	1770	3539	1583
Flt Permitted	0.722			0.436			0.148			0.069		
Satd. Flow (perm)	1345	3235	0	812	1863	1583	276	3539	1583	129	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		151				110			87			107
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		293			315			341			427	
Travel Time (s)		6.7			7.2			7.8			9.7	
Volume (vph)	132	103	139	57	49	101	128	1396	109	119	1092	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	143	112	151	62	53	110	139	1517	118	129	1187	116
Lane Group Flow (vph)	143	263	0	62	53	110	139	1517	118	129	1187	116
Turn Type	pm+pt			pm+pt		Perm	pm+pt		Perm	pm+pt		Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phases	7	4		3	8	8	5	2	2	1	6	6
Minimum Initial (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	20.0		8.0	20.0	20.0	8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	14.0	19.0	0.0	14.0	19.0	19.0	13.0	64.0	64.0	13.0	64.0	64.0
Total Split (%)	13%	17%	0%	13%	17%	17%	12%	58%	58%	12%	58%	58%
Maximum Green (s)	10.0	15.0		10.0	15.0	15.0	9.0	60.0	60.0	9.0	60.0	60.0
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lead/Lag	Lead	Lag		Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None	None	None	Coord	Coord	None	Coord	Coord
Walk Time (s)		5.0			5.0	5.0		5.0	5.0		5.0	5.0
Flash Dont Walk (s)		11.0			11.0	11.0		11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)		0			0	0		0	0		0	0
Act Effct Green (s)	20.4	12.3		17.3	9.0	9.0	75.3	67.4	67.4	75.3	67.4	67.4
Actuated g/C Ratio	0.19	0.11		0.16	0.08	0.08	0.68	0.61	0.61	0.68	0.61	0.61
v/c Ratio	0.50	0.53		0.31	0.35	0.48	0.47	0.70	0.12	0.63	0.55	0.11
Uniform Delay, d1	37.0	19.2		35.4	47.0	0.0	5.0	15.0	2.3	8.6	12.9	0.7
Delay	37.4	20.1		34.9	46.6	8.9	5.4	15.5	3.7	15.5	13.3	2.5
LOS	D	C		C	D	A	A	B	A	B	B	A
Approach Delay		26.2			24.9			14.0			12.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		C			C			B			B	
Queue Length 50th (ft)	88	40		36	36	0	26	356	8	27	237	2
Queue Length 95th (ft)	141	80		70	74	52	52	503	35	96	341	27
Internal Link Dist (ft)		213			235			261			347	
50th Up Block Time (%)								13%				
95th Up Block Time (%)								23%			3%	
Turn Bay Length (ft)	150			150			300		180	175		175
50th Bay Block Time %								9%			13%	
95th Bay Block Time %	1%							20%			23%	
Queuing Penalty (veh)								20			23	

Intersection Summary

Area Type: Other
Cycle Length: 110
Actuated Cycle Length: 110
Offset: 40 (36%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 75
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 15.4 Intersection LOS: B
Intersection Capacity Utilization 73.8% ICU Level of Service C

Splits and Phases: 3: Int



Description

Legal descriptions as contained in Stewart Title Guaranty Company Commitment for Title Insurance File Number 10030693, effective date March 25, 2010.

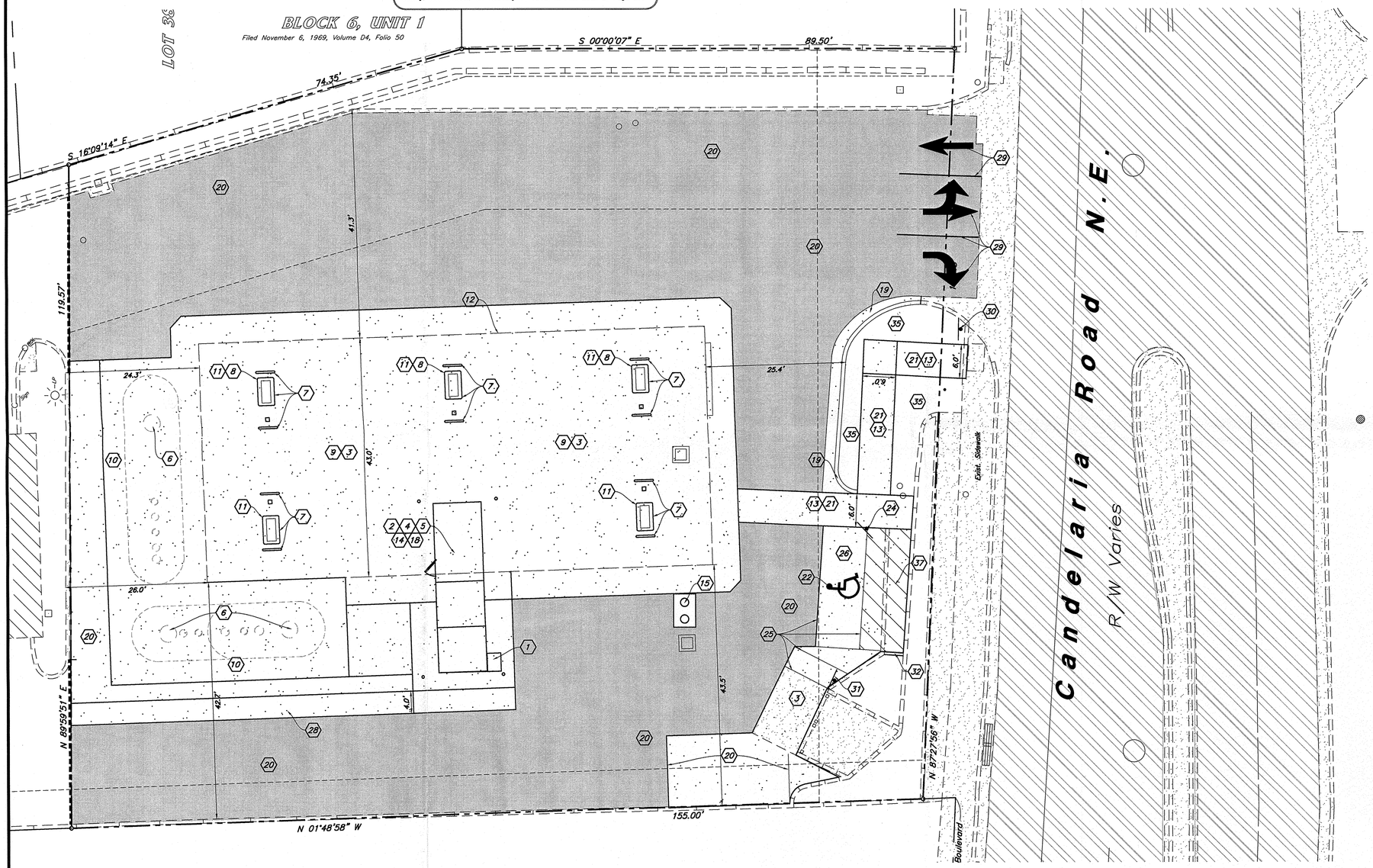
Portions of Lots numbered One (1), Two (2) and Three (3) in Block numbered Four (4), of University Heights, an Addition to the City of Albuquerque, New Mexico, as the same are shown and designated on the Plat thereof, filed in the office of the County Clerk of Bernalillo County, New Mexico, on February 7, 1916;
Thence N. 89°53' W., 142 feet along south line of Lot 3; Thence N. 0°07' E., 9.06 feet; Thence to the left along a curve of 15.61' in a northeasterly direction 75.18 feet; Thence N. 50°57' E., 47.36 feet; Thence to the right along a curve of 18.67', 50.50 feet; (Chord N. 55°39'44" E., 50.40 feet); Thence S. 0°07' W., 109.60 feet to the place of beginning.
AND
All of Lots numbered Four (4), Five (5) and Six (6) in Block numbered Four (4), of University Heights, an Addition to the City of Albuquerque, New Mexico, as the same are shown and designated on the Plat thereof, filed in the office of the County Clerk of Bernalillo County, New Mexico, on February 7, 1916, in Plat Book D, Page 27.

General Site Notes:

1. All dimensions are to back of curb unless otherwise noted.
2. Contractor to repair and/or replace all landscaping and sprinkling systems damaged or altered due to construction
3. Should discrepancies be found between the civil and architectural drawing, the civil plans shall govern.
4. Contractor shall paint the canopy collection boxes white to match the decking color.

Site Data

Total Site Area	= 21,016 Sq. Ft. (0.48 Acres)
Kiosk Area	= 267 Sq. Ft.
Canopy Area	= 3,956 Sq. Ft.
Parking Required	= 1 Stall
Parking Provided	= 1 Stall + 1 Accessible Stall



Scale : 1" = 10'

10 0 10 20

Gas Station Notes:

1. GC to Supply, Assemble and Install 4'x2' Outside Wood Shed (25/C4.4)
2. Install roof penetration in kiosk and weather proof for speaker/camera wire installation.
3. All concrete slabs shall be cleaned and sealed by Owner. Contractor shall coordinate with the Owner provided Contractor (White Mountain, Mike Letts 801-547-9278).
4. Provide caulking and painting as necessary to touch up exterior panels of the kiosk.
5. GC is to Caulk inside and outside of Kiosk in conjunction with Galloway Foundation Detail.
6. Clean and paint the tank manhole covers. Paint fuel designations at the drop tubes with the correct color and name.

   All paints specified are Sherwin Williams Industrial Enamel B66-0voc Series.
   When painting manholes, the rim of the manhole that is embedded in the concrete should be painted along with the manhole lid.

   Regular Unleaded SW4089, Pure White with a Black cross.
   Premium Unleaded SW4081, Safety Red with a White cross.
   Diesel SW4084, Safety Yellow
7. Paint all bollards and island forms with Contractor supplied Sherwin Williams Industrial Enamel B66-0voc Series Paint.
8. Install a diesel tee, plug, and fittings in the MPD sumps of the islands with diesel.
9. Construct 6" Thick Concrete Canopy Drive Slab w/ Fiber Mesh (14/C4.2)
10. Construct 8" Thick Concrete Tank Pad w/ Fiber Mesh & Rebar Reinforcing. (See Architectural Plans for Section)
11. Contractor Shall Construct Dispenser Islands with Expansion Joint around Island & Bollard Protection. Install Fuel Dispenser (See Arch Plans) (Typ)
12. Overhead Canopy System Supplied and Installed by others. General Contractor to Install Footings, Conduits, & Conductors per Drawings by Madison Industries.
13. Const. ADA Accessible Ramp (5/C4.1)
14. General Contractor to Const. Floor and Foundation then Place Prefabricated Kiosk (17/C4.2)
15. Oil Water Separator. Coordinate with Utility Plan.
16. Const. 4'x6'x6" Concrete Pad for Air/Water. See Arch. Plans for Section. (15/C4.2)
17. Const. Remote Tank Vent Risers. (16/C4.2)
18. GC to Install Mechanical Equipment Screen Provided by Others
19. Const. 24" Curb & Gutter (1/C4.1)
20. Const. Asphalt Paving (2/C4.1) (4/C4.1)
21. Const. Conc. Sidewalk (4/C4.1)
22. Const. ADA Accessible Striping (12/C4.2)
23. Const. Light Pole (See Site Electrical Plans)
24. Const. ADA Accessible Sign (11/C4.2)
25. Const. 4" Yellow Paint Stripe (Typ.)
26. Const. Conc. Paving (3/C4.1)
27. Const. Wheel Stop (Typ.)
28. Const. 4' Wide Concrete Waterway (24/C4.3)
29. Const. Asphalt Markings per MUTCD (Typ.)
30. Const. Stop Sign per MUTCD R1-1
31. Const. Motorcycle Parking Space & Sign (20/C4.3)
32. Const. 6" Conc. Curb Wall (9/C4.1)
33. Const. Bicycle Rack (21/C4.3)
34. Const. Curb Transition Taper (8/C4.1)
35. Landscape, See Landscape Plans
36. Proposed Pylon Sign Location (By Separate Permit)
37. Const. Yellow Paint Hatching 45° @ 2.0' O.C.

Survey Control Note:

The contractor or surveyor shall be responsible for following the National Society of Professional Surveyors (NSPS) model standards for any surveying or construction layout to be completed using Great Basin Engineering's ALTA Surveys or Great Basin Engineering's construction improvement plans. Prior to proceeding with construction staking, the surveyor shall be responsible for verifying horizontal control from the survey monuments and for verifying any additional control points shown on an ALTA survey, improvement plan, or on electronic data provided by Great Basin Engineering. The surveyor shall also use the benchmarks as shown on the plan, and verify them against no less than three existing hard improvement elevations included on these plans or on electronic data provided by Great Basin Engineering. If any discrepancies are encountered, the surveyor shall immediately notify the engineer and resolve the discrepancies before proceeding with any construction staking.

ADA Note:

Contractor must maintain a running slope on Accessible routes no steeper than 5.0% (1:20). The cross slope for Accessible routes must be no steeper than 2.0% (1:50). All Accessible routes must have a minimum clear width of 36". If Grades on plans do not meet this requirement notify Consultant immediately.
The Client, Contractor and Subcontractor should immediately notify the Consultant of any conditions of the project that they believe do not comply with the current state of the ADA and/or FHAA.

PRIVATE ENGINEER'S NOTICE TO CONTRACTORS

The Contractor agrees that he shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the contractor shall defend, indemnify, and hold the owner and the engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting for liability arising from the sole negligence of the owner or the engineer.

New Mexico One Call, Inc.
NMOC
Professional Resources for Damage Prevention
1-800-321-ALERT

RECEIVED
JAN 17 2012
BY:

Smith's
FOOD & DRUG STORES
1550 South Redwood Road
Salt Lake City, Utah 84104
Telephone (801) 974-1400

 # 439
Albuquerque, New Mexico

REV	DATE	DESCRIPTION

Designed by: KR
Drafted by: AM
Client Name: Smith's
SMC439-SP

GREAT BASIN ENGINEERING - SOUTH
CONSULTING ENGINEERS and LAND SURVEYORS
2010 North Redwood Road, P.O. Box 16747
Salt Lake City, Utah 84116
Salt Lake City (801)521-8529 Ogden (801)394-7288 Fax (801)521-8531

Site Plan

Smith's Fuel Center #439
Candelaria Road and Tramway
Albuquerque, Bernalillo County, New Mexico

BRET GENE WAHLEN
NEW MEXICO
12972
REGISTERED PROFESSIONAL ENGINEER

7 Nov, 2011

SHEET NO.
C1.1